DIPLOMA IN COMPUTER ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2014

(FIRST YEAR)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Year	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
CM-101	English-I	2	-	60	3	30	70	100
CM-102	Engineering Mathematics - I	5	-	150	3	20	80	100
CM-103	Engineering Physics	4	-	120	3	20	80	100
CM-104	Engineering Chemistry and Environmental studies	4	-	120	3	20	80	100
CM-105	Basics of Computer Engineering	4	-	120	3	20	80	100
CM-106	Programming in C	5	-	180	3	20	80	100
PRACTICAL SUBJECTS								
CM-107	Engineering Drawing	-	6	180	3	40	60	100
CM-108	C Programming Lab Practice	-	6	180	3	40	60	100
CM-109	Physics Lab Practice	-	3	90	3	20	30	50
	Chemistry Lab Practice	-			3	20	30	50
CM-110	Computer Fundamentals Lab Practice	-	3	120	3	40	60	100
	Total	**24**	**18**	**1320**	**-**	**270**	**630**	**900**

CM-101,102,103,104,107,109 common with all branches

DIPLOMA IN COMPUTER ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2014 (III Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
CM-301	Mathematics –II	4	-	60	3	20	80	100
CM-302	Basic Electrical & Electronics Engg.	4	-	60	3	20	80	100
CM-303	Digital Electronics	4	-	60	3	20	80	100
CM-304	Computer Organization	4	-	60	3	20	80	100
CM-305	Data Structures through C	4	-	60	3	20	80	100
CM-306	RDBMS	4	-	60	3	20	80	100
PRACTICAL SUBJECTS								
CM-307	Digital Electronics Lab Practice	-	3	45	3	40	60	100
CM-308	Data Structures Through C Lab Practice	-	6	90	3	40	60	100
CM-309	RDBMS Lab Practice	-	6	90	3	40	60	100
CM-310	Electronic Workshop Practice		3	45	3	40	60	100
	Total	24	18	630		280	720	1000

CM-301 common with all branches

DIPLOMA IN COMPUTER ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2014

(IV Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Practicals		Duration (hrs)	Sessional Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
CM-401	Mathematics III	4	-	60	3	20	80	100
CM-402	Operating systems	4	-	60	3	20	80	100
CM-403	Computer Hardware & Maintenance	4	-	60	3	20	80	100
CM-404	Microprocessors	4	-	60	3	20	80	100
CM-405	OOP through C++	4	-	60	3	20	80	100
CM-406	Computer Networks	4	-	60	3	20	80	100
PRACTICAL SUBJECTS								
CM-407	Computer Hardware & Networking Lab	-	6	90	3	40	60	100
CM-408	Communication Skills Lab Practice	-	3	45	3	40	60	100
CM-409	Microprocessors Lab	-	3	45	3	40	60	100
CM-410	C++ Lab Practice	-	6	90	3	40	60	100
	Total	24	18	630	-	280	720	1000

CM-401 & 408 common with all branches

DIPLOMA IN COMPUTER ENGINEERING
SCHEME OF INSTRUCTIONS AND EXAMINATION

CURRICULUM-2014

(V Semester)

Sub Code	Name of the Subject	Instruction Periods/Week		Total Periods Per Semester	Scheme Of Examinations			
		Theory	Pract--icals		Duration (hrs)	Sessio-nal Marks	End Exam Marks	Total Marks
THEORY SUBJECTS								
CM-501	Java Programming	4	-	60	3	20	80	100
CM-502	Software Engineering	4	-	60	3	20	80	100
CM-503	Advanced Database Systems	4	-	60	3	20	80	100
CM-504	Web Designing	4	-	60	3	20	80	100
CM-505	Mobile Communication	4	-	60	3	20	80	100
CM-506	Cloud Computing	4		60	3	20	80	100
PRACTICAL SUBJECTS								
CM-507	Java Programming Lab Practice	-	4	45	3	40	60	100
CM-508	Life Skills	_	3	45	3	40	60	100
CM-509	Web Designing Lab Practice	-	4	45	3	40	60	100
CM-510	Field Practices	-	7	45	3	40	60	100
	Total	**24**	**18**	**630**	**-**	**320**	**730**	**1050**

CM-508 common with all branches

C-14 DIPLOMA IN COMPUTER ENGINEERING

SCHEME OF INSTRUCTIONS AND EXAMINATIONS
VI Semester

Subject Code	Name of the Subject	Instruction period / week		Total Period / Sem	Scheme of Examination			
		Theory	Practical /Tutorial		Duration (hours)	Sessional Marks	End Exam Marks	Total Marks
THEORY:								
CM- 601	Industrial Management &Entrepreneurship	4	-	60	3	20	80	100
CM-602	Advance Java Programming	4	-	60	3	20	80	100
CM - 603	System Administration	4	-	60	3	20	80	100
CM - 604	Data Communication	4	-	60	3	20	80	100
CM - 605	.Net Programming	4	-	60	3	20	80	100
CM - 606	Cryptography and Network Security	4	-	60	3	20	80	100
PRACTICAL:								
CM- 607	Advance Java Programming Lab Practice	-	4	60	3	40	60	100
CM -608	System Administration Lab Practice	-	4	60	3	40	60	100
CM -609	.Net Programming Lab Practice	-	3	45	3	40	60	100
CM -610	**Project work**	-	7	105	3	40	60	100
	TOTAL	24	18	630		280	720	1000

Note: CM-601: IME is common with DECE branch

DIPLOMA IN COMPUTER ENGINEERING

SCHEME OF INSTRUCTIONS AND EXAMINATIONS
(FIRST YEAR)

Subject Code	Name of the Subject	Instruction period / week		Total Period / year	Scheme of Examination			
		Theory	Practical /Tutorial		Duration (hours)	Sessional Marks	End Exam Marks	Total Marks
THEORY:								
CM-101	English	3	-	90	3			100
CM-102	Engineering Mathematics - I	5	-	150	3			100
CM-103	Engineering Physics	4	-	120	3			100
CM-104	Engineering Chemistry &Environmental Studies	4	-	120	3			100
CM-105	Basics of Computer Engineering	4	-	120	3	20	80	100
CM-106	Programming in C	5	-	150	3	20	80	100
PRACTICAL:								
CM-107	Engineering Drawing practice	-	6	180	3			100
CM-108	C Programming Lab Practice	-	6	180	3	40	60	100
CM-109	109-A Engineering Physics Lab practice 109-B Engineering Chemistry Lab practice	-	3	90	3 (1.5+1.5)			100 (50+50)
CM-110	Computer fundamentals Lab practice	-	3	90	3			100
	TOTAL	24	18	1290				1000

ENGLISH

(Common to all Branches)

Subject Title : English
Subject Code : CM - 101
Periods per Week : 03
Periods per Year : 90

Time Schedule

Sl No	Major Topics	No. of Periods	Weightage of Marks	No of Short Answers	No of Long Answers
1	Vocabulary	5	13	1	1
2	Grammar	30	31	7	1
3	Reading	10	10	-	1
4	Writing	30	40	-	4
5	English in Action	15	16	2	1
		90	110	10	08

Rationale and Scope

Globalization has ushered in an era of opportunities for those who have the necessary competencies. Effective communication is one among them. This shift demands strengthening of English in polytechnics. In C-14 Curriculum the focus is on the special English needs of technician studies and training. This course aims at integration of the four fold language abilities viz., listening, speaking, reading and writing. The use of English for learning technical subjects and for performing technical functions like, writing repots, giving instructions and interpreting graphics is of great importance. Therefore the curriculum C-14 focuses on improving communicative abilities equipping the students to become industry- ready and employable.

Upon completion of this course the student shall be able to

1.0 Build their vocabulary in the direction of their future needs
2.0 Learn various grammatical structures
3.0 Read and comprehend English and understand the details and draw inferences
4.0 Learn to be competent in various forms of written communication (writing composition and data interpretation)
5.0 Practice spoken communication suited to various situations.

1.0 Extend their vocabulary in the direction of their future needs

1.1 Locate words, learn spellings, understand meanings
1.2 Pronounce words intelligibly
1.3 Find synonyms and antonyms

1.4 Use affixation
1.5 Comprehend meanings of words by understanding meanings of roots

2.0 Learn various grammatical structures
2.1 Identify and use nouns
2.2 Identify and use pronouns
2.3 Use the present tense
2.4 Use the past tense
2.5 Use the future tense
2.6 Identify and use adjectives
2.7 Identify and use adverbs
2.8 Use prepositions
2.9 Use linkers
2.10 State basic sentence structures
2.11 Construct different types of sentences
2.12 Frame questions to elicit information
2.13 Frame questions for conformation
2.14 Use active voice
2.15 Use passive voice
2.16 Use direct speech
2.17 Use indirect speech
2.18 Identify and correct errors

3.0 Read and comprehend English
3.1 Identify the main ideas
3.2 Identify the specific details
3.3 Draw inferences
3.4 Give contextual meanings of the words
3.5 Perceive tone in a text

4.0 Learn to excel in various forms of written communication (writing composition and data interpretation)
4.1 Identify components of a good paragraph
4.2 Write types of paragraphs
4.3 Distinguish between formal and informal letters
4.4 Write personal letters
4.5 Write leave letters
4.6 Write official letters
4.7 Write letters of complaints
4.8 Prepare a resume
4.9 Write a cover letter
4.10 Write short messages
4.11 Report incidents
4.12 Report experiments
4.13 Report Industrial visits
4.14 Write work done statements
4.15 Write maintenance reports
4.16 Make notes using Cue method and Mapping method
4.17 Summarize Paragraphs
4.18 Present and Interpret Data from flow charts, tree diagrams, bar graphs, tables, pie charts

5.0 Practice spoken communication suited to various situations.

5.1 Use appropriate expressions to greet and take leave
5.2 Use proper expressions to make requests
5.3 Use apt expressions for asking and giving directions
5.4 Use suitable expressions to seek and offer suggestions
5.5 Use suitable expressions to state intentions
5.6 Use suitable expressions to state feelings
5.7 Use appropriate expressions to state agreement and disagreement
5.8 Use proper expressions to make complaints
5.9 Use suitable expressions to express obligations

Course Material

The textbook prepared by the faculty of English of Polytechnics in AP.

Reference Books

1. Essential English Grammar (Intermediate Level) Raymond Murphy
2. Learn English (A Fun Book of Functional Language, Grammar and Vocabulary) Santanu Sinha Chaudhuri
3. Grammar Builder (Entire Series) Oxford University Press
4. High School English Grammar (Revised Edition) Wren and Martin
5. Sentence skills with Readings (fourth Edition, Tata McGraw Hill) John Langan, Paul Langan
6. Word Power Made Easy Norman Lewis
7. Spoken English Shashi Kumar and Dhamija

ENGINEERING MATHEMATICS – I
(Common to all Branches)

Subject Title : Engineering Mathematics-I
Subject Code : CM-102
Periods per week : 04
Periods per Semester : 60

Blue print

S. No	Major Topic	No of Periods		Weightage of Marks	Short Type			Essay Type		
	Unit - I : Algebra	**Theory**	**Practice**		**R**	**U**	**App**	**R**	**U**	**App**
1	Logarithms	3	0	0	0	0	0	0	0	0
2	Partial Fractions	5	0	3	0	1	0	0	0	0
3	Matrices and Determinants	10	10	16	2	0	0	0	0	1
	Unit - II : Trigonometry									
4	Trigonometric Ratios	2	0	0	0	0	0	0	0	0
5	Compound Angles	3	2	3	1	0	0	0	0	0
6	Multiple and Submultiple angles	4	4	3	0	1	0	0	0	0
7	Transformations	4	4	5	0	0	0	1/2	0	0
8	Inverse Trigonometric Functions	3	2	5	0	0	0	0	1/2	0
9	Trigonometric Equations	3	2	5	0	0	0	1/2	0	0
10	Properties and solutions of triangles	4	4	5	0	0	0	0	0	½
11	Hyperbolic Functions	2	0	0	0	0	0	0	0	0
12	Complex Numbers	4	2	3	1	0	0	0	0	0
	Unit III : Co-ordinate Geometry									
13	Straight Lines	4	2	3	1	0	0	0	0	0
14	Circle	4	2	3	1	0	0	0	0	0
15	Conic Sections	5	4	10	0	0	0	0	1	0

S. No	Major Topic	No of Periods		Weightage of Marks	Short Type			Essay Type		
Unit – IV : Differential Calculus										
16	Limits and Continuity	4	2	3	0	1	0	0	0	0
17	Differentiation	18	10	23	1	0	0	1	1	0
Unit - V : Applications of Differentiation										
18	Geometrical Applications	3	2	5	0	0	0	0	0	½
19	Physical Applications	2	2	5	0	0	0	0	0	½
20	Maxima and Minima	3	4	5	0	0	0	0	0	½
21	Errors and Approximations	2	0	5	0	0	0	0	0	½
	Total	92	58	110	7	3	0	2	2 1/2	3 ½
				Marks	21	9	0	20	25	35

R: Remembering type 41 marks
U: Understanding type 34 marks
App: Application type 35 marks

Objectives

Upon completion of the course the student shall be able to

UNIT – I

Algebra

1.0 Use Logarithms in engineering calculations

1.1 Define logarithm and list its properties.

1.2 Distinguish natural logarithms and common logarithms.

1.3 Explain the meaning of e and exponential function.

1.4 State logarithm as a function and its graphical representation.

1.5 Use the logarithms in engineering calculations.

2.0 Resolve Rational Fraction into sum of Partial Fractions in engineering problems

2.1 Define the following fractions of polynomials:

1. Rational,
2. Proper and
3. Improper

2.2 Explain the procedure of resolving rational fractions of the type mentioned below into partial fractions

$i)$ $\dfrac{f(x)}{(x+a)(x+b)(x+c)}$ $ii)$ $\dfrac{f(x)}{(x+a)^2(x+b)(x+c)}$

$iii)$ $\dfrac{f(x)}{(x^2+a)(x+b)}$ $iv)$ $\dfrac{f(x)}{(x+a)(x^2+b)^2}$

3.0 Use Matrices for solving engineering problems

3.1 Define a matrix and order of a matrix.

3.2 State various types of matrices with examples (emphasis on 3rd order square matrices).

3.3 Compute sum, scalar multiplication and product of matrices.

3.4 Illustrate the properties of these operations such as associative, distributive, commutative properties with examples and counter examples.

3.5 Define the transpose of a matrix and write its properties.

3.6 Define symmetric and skew-symmetric matrices.

3.7 Resolve a square matrix into a sum of symmetric and skew- symmetric matrices with examples in all cases.

3.8 Define minor, co-factor of an element of a 3x3 square matrix with examples.

3.9 Expand the determinant of a 3 x 3 matrix using Laplace expansion formula.

3.10 Distinguish singular and non-singular matrices.

3.11 Apply the properties of determinants to solve problems.

3.12 Solve system of 3 linear equations in 3 unknowns using Cramer's rule.

3.13 Define multiplicative inverse of a matrix and list properties of adjoint and inverse.

3.14 Compute adjoint and multiplicative inverse of a square matrix.

3.15 Solve system of 3 linear equations in 3 unknowns by matrix inversion method

3.16 State elementary row operations.

3.17 Solve a system of 3 linear equations in 3 unknowns by Gauss- Jordan method

UNIT – II
Trigonometry :

4.0 Understand Trigonometric Ratios

4.1 Define trigonometric ratios of any angle.

4.2 List the values of trigonometric ratios at specified values.

4.3 Draw graphs of trigonometric functions

4.4 Explain periodicity of trigonometric functions.

5.0 Solve simple problems on Compound Angles

5.1 Define compound angles and state the formulae of sin(A±B), cos(A±B), tan(A±B) and cot(A±B)

5.2 Give simple examples on compound angles to derive the values of $\sin 15^0$, $\cos 15^0$, $\sin 75^0$, $\cos 75^0$, $\tan 15^0$, $\tan 75^0$ etc.

5.3 Derive identities like $\sin(A+B)\sin(A-B) = \sin^2 A - \sin^2 B$ etc.,

5.4 Solve simple problems on compound angles.

6.0 Solve problems using the formulae for Multiple and Sub- multiple Angles

6.1 Derive the formulae of multiple angles 2A, 3A etc and sub multiple angles A/2 in terms of angle A of trigonometric functions.

6.2 Derive useful allied formulas like $\sin A = (1 - \cos 2A)/2$ etc.,

6.3 Solve simple problems using the above formulae

7.0 Apply Transformations for solving the problems in Trigonometry

7.1 Derive the formulae on transforming sum or difference of two trigonometric ratios in to a product and vice versa- examples on these formulae.

7.2 Solve problems by applying these formulae to sum or difference or product of three or more terms.

8.0 Use Inverse Trigonometric Functions for solving engineering problems

8.1 Explain the concept of the inverse of a trigonometric function by selecting an appropriate domain and range.

8.2 Define inverses of six trigonometric functions along with their domains and ranges.

8.3 Derive relations between inverse trigonometric functions so that given $A = \sin^{-1}x$, express angle A in terms of other inverse trigonometric functions - with examples.

8.4 State various properties of inverse trigonometric functions and identities like $\sin^{-1}x + \cos^{-1}x = \frac{\pi}{2}$ etc.

8.5 Derive formulae like $\tan^{-1}x + \tan^{-1}y = \tan^{-1}\left(\frac{x+y}{1-xy}\right), \ where \ x \geq 0, y \geq 0, xy < 1$ etc.,

8.6 Solve simple problems.

9.0 Solve Trigonometric Equations in engineering applications

9.1 Explain what is meant by solutions of trigonometric equations and find the general solutions of $\sin x = k$, $\cos x = k$ and $\tan x = k$ with appropriate examples.

9.2 Solve models of the type $a\sin^2 x + b\sin x + c = 0$, $a\cos x + b\sin x = c$ etc., and problems using simple transformations.

10.0 Appreciate Properties of triangles and their solutions

10.1 State sine rule, cosine rule, tangent rule and projection rule.

10.2 Explain the formulae for sin A/2, cos A/2, tan A/2 and cot A/2 in terms of semi-perimeter and sides a, b, c and solve problems.

10.3 List various formulae for the area of a triangle.

10.4 Solve problems using the above formulae.

10.5 Solve a triangle when (i) three sides, (ii) two sides and an included angle, (iii) two sides and an opposite angle-case of two solutions and (iv) one side and two angles are given.

11.0 Represent the Hyperbolic Functions in terms of logarithm functions

11.1 Define Sinh x, cosh x and tanh x and list the hyperbolic identities.

11.2 Represent inverse hyperbolic functions in terms of logarithms.

12.0 Represent Complex numbers in various forms

12.1 Define complex number, its modulus , conjugate and list their properties.

12.2 Define the operations on complex numbers with examples.

12.3 Define amplitude of a complex number

12.4 Represent the complex number in various forms like modulus-amplitude (polar) form, Exponential (Euler) form – illustrate with examples.

12.5 State DeMoivre's theorem and its applications to complex numbers e.g., finding the roots, powers, simplifications of a complex number with illustrative examples

UNIT - III

Coordinate Geometry

13.0 Solve the problems on Straight lines

13.1 Write the different forms of a straight line – point slope form, two point form, intercept form, normal form and general form

13.2 Solve simple problems on the above forms

13.3 Find distance of a point from a line, acute angle between two lines, intersection of two non-parallel lines and distance between two parallel lines.

14.0 Solve the problems on Circles

14.1 Define locus of a point – circle and its equation.

14.2 Find the equation of a circle given

(i) Center and radius

(ii) Two ends of a diameter

(iii) Centre and a point on the circumference

(iv) Three non collinear points

(v) Centre and tangent

14.3 Write the general equation of a circle and find the centre and radius.

14.4 Write the equation of tangent and normal at a point on the circle.

14.5 Solve the problems to find the equations of tangent and normal.

15.0 Appreciate the properties of Conics in engineering applications

15.1 Define a conic section.

15.2 Explain the terms focus, directrix, eccentricity, axes and latus rectum of a conic with illustrations.

15.3 Find the equation of a conic when focus, directrix and eccentricity are given

15.4 Describe the properties of Parabola, Ellipse and Hyperbola

15.5 Solve engineering problems in simple cases of Parabola and Ellipse.

UNIT - IV

Differential Calculus

16.0 Use the concepts of Limit and Continuity for solving the problems

16.1 Explain the concept of limit and meaning of $\lim_{x\to a} f(x)=l$ and state the properties of limits .

16.2 Mention the Standard limits $\lim_{x\to a}\frac{x^n-a^n}{x-a}$, $\lim_{x\to 0}\frac{\sin x}{x}$, $\lim_{x\to 0}\frac{\tan x}{x}$, $\lim_{x\to 0}\frac{a^x-1}{x}$, $\lim_{x\to 0}\frac{e^x-1}{x}$, $\lim_{x\to 0}(1+x)^{\frac{1}{x}}$, $\lim_{x\to\infty}\left(1+\frac{1}{x}\right)^x$ (All without proof).

16.3 Solve the problems using the above standard limits

16.4 Evaluate the limits of the type $\lim_{x\to l}\frac{ax^2+bx+c}{\alpha x^2+\beta x+\gamma}$ and $\lim_{x\to\infty}\frac{f(x)}{g(x)}$

16.5 Explain the concept of continuity of a function at a point and on an interval with some examples whether a given function is continuous or not.

17.0 Appreciate Differentiation and its meaning in engineering situations

17.1 State the concept of derivative of a function y = f(x) – definition, first principle as $\lim_{h\to 0}\frac{f(x+h)-f(x)}{h}$ and also provide standard notations to denote the derivative of a function.

17.2 State the significance of derivative in scientific and engineering applications.

17.3 Find the derivatives of elementary functions like x^n , a^x, e^x, log x, sin x, cos x, tanx, Secx, Cosecx and Cot x using the first principles.

17.4 Find the derivatives of simple functions from the first principle .

17.5 State the rules of differentiation of sum, difference, scalar multiplication, product and quotient of functions with illustrative and simple examples.

17.6 Explain the method of differentiation of a function of a function (Chain rule) with illustrative examples such as

(i) $\sqrt{t^2+\frac{2}{t}}$ **(ii)** $x^2 \sin 2x$ **(iii)** $\frac{x}{\sqrt{x^2+1}}$ **(iv)** $\log\left(\sin(\cos x)\right)$.

17.7 Find the derivatives of Inverse Trigonometric functions and examples using the Trigonometric transformations.

17.8 Explain the method of differentiation of a function with respect to another function and also differentiation of parametric functions with examples.

17.9 Find the derivatives of hyperbolic functions.

17.10 Explain the procedures for finding the derivatives of implicit function with examples.

17.11 Explain the need of taking logarithms for differentiating some functions with examples like $[f(x)]^{g(x)}$.

17.12 Explain the concept of finding the higher order derivatives of second and third order with examples.

17.13 Explain the concept of functions of several variables, partial derivatives and difference between the ordinary and partial derivatives with simple examples.

17.14 Explain the definition of Homogenous function of degree n

17.15 Explain Euler's theorem for homogeneous functions with applications to simple problems.

UNIT - V

Applications of the Differentiation

18.0 Understand the Geometrical Applications of Derivatives

18.1 State the geometrical meaning of the derivative as the slope of the tangent to the curve y=f(x) at any point on the curve.

18.2 Explain the concept of derivative to find the slope of tangent and to find the equation of tangent and normal to the curve y=f(x) at any point on it.

18.3 Find the lengths of tangent, normal, sub-tangent and sub normal at any point on the curve y=f(x) .

18.4 Explain the concept of angle between two curves and procedure for finding the angle between two given curves with illustrative examples.

19.0 Understand the Physical Applications of Derivatives

19.1 Explain the derivative as a rate of change in distance-time relations to find the velocity and acceleration of a moving particle with examples.

19.2 Explain the derivative as a rate measurer in the problems where the quantities like volumes, areas vary with respect to time- illustrative examples.

20.0 Use Derivatives to find extreme values of functions

20.1 Define the concept of increasing and decreasing functions.

20.2 Explain the conditions to find points where the given function is increasing or decreasing with illustrative examples.

20.3 Explain the procedure to find the extreme values (maxima or minima) of a function of single variable - simple problems yielding maxima and minima.

20.4 Solve problems on maxima and minima in applications like finding areas, volumes, etc.

21.0 Use Derivatives to find Errors and Approximations

21.1 Find the absolute error, approximate error, relative error and percentage error in functions of single variable.

COURSE CONTENT

Unit-I

Algebra

1. Logarithms :

Definition of logarithm and its properties, natural and common logarithms; the meaning of e and exponential function, logarithm as a function and its graphical representation.

2. Partial Fractions :

Rational, proper and improper fractions of polynomials. Resolving rational fractions in to their partial fractions covering the types mentioned below:

$$i)\quad \frac{f(x)}{(x+a)(x+b)(x+c)} \qquad ii)\quad \frac{f(x)}{(x+a)^2(x+b)(x+c)}$$

$$iii)\quad \frac{f(x)}{(x^2+a)(x+b)} \qquad iv)\quad \frac{f(x)}{(x+a)(x^2+b)^2}$$

Matrices:

3. Definition of matrix, types of matrices-examples, algebra of matrices-equality of two matrices, sum, scalar multiplication and product of matrices. Transpose of a matrix-Symmetric, skew symmetric matrices-Minor, cofactor of an element-Determinant of a square matrix-Laplace's expansion, properties of determinants. Singular and non singular matrices-Adjoint and multiplicative inverse of a square matrix- examples-System of linear

equations in 3 variables-Solutions by Cramers's rule, Matrix inversion method-examples-Elementary row operations on matrices -Gauss-Jordan method to solve a system of equations.

Unit-II

Trigonometry:

4.Trigonometric ratios: definition of trigonometric ratios of any angle, values of trigonometric ratios at specified values, draw graphs of trigonometric functions, periodicity of trigonometric functions.

5. Compound angles: Formulas of sin(A±B), cos(A±B), tan(A±B),cot(A±B),and related identities with problems.

6. Multiple and sub multiple angles: trigonometric ratios of multiple angles 2A,3A and submultiple angle A/2 with problems.

7. Transformations of products into sums or differences and vice versa simple problems

8. Inverse trigonometric functions : definition, domains and ranges-basic properties-problems.

9. Trigonometric equations: concept of a solution, principal value and general solution of trigonometric equations :

   sin x =k , cos x= k, tan x =k.

   Solutions of simple quadratic equations, equations involving usage of transformations-problems.

10. Properties and solutions of triangles: relation between sides and angles of a triangle- sine rule, cosine rule, tangent rule and projection rule-area of a triangle- solving a triangle-problems.

11. Hyperbolic functions: Definitions of hyperbolic functions, identities of hyperbolic functions, inverse hyperbolic functions and expression of inverse hyperbolic functions in terms of logarithms.

12. Complex Numbers : Definition of a complex number, Modulus and conjugate of a complex number, Arithmetic operations on complex numbers, Modulus- Amplitude (polar) form, Exponential form(Euler) form of a complex number- Problems. DeMoivre's Theorem and its applications in complex numbers- Simple problems.

UNIT-III

Coordinate geometry

13. Straight lines: various forms of straight lines, angle between lines, perpendicular distance from a point, distance between parallel lines-examples.
14. Circle: locus of appoint, Circle, definition-Circle equation given (i) center and radius, (ii) two ends of a diameter (iii) centre and a point on the circumference (iv) three non collinear points and (v) centre and tangent equation - general equation of a circle - finding center, radius: tangent, normal to circle at a point on it.
15. Definition of a conic section, equation of a conic when focus directrix and eccentricity are given. Properties of parabola, ellipse and hyperbola, standard forms - applications of parabola and ellipse to engineering situations.

UNIT-IV

Differential Calculus

16. Concept of Limit- Definition- Properties of Limits and Standard Limits -Simple Problems- Continuity of a function at a point- Simple Examples only.
17. Concept of derivative- definition (first principle)- different notations-derivatives of elementary functions - problems. Derivatives of sum, product, quotient, scalar multiplication of functions - problems. Chain rule, derivatives of inverse trigonometric functions, derivative of a function with respect to another function, derivative of parametric functions, derivative of hyperbolic, implicit functions, logarthmic differentiation – problems in each case. Higher order derivatives - examples – functions of several variables – partial differentiation, Euler's theorem-simple problems.

UNIT-V

Applications of Derivatives:

18. Geometrical meaning of the derivative, equations of Tangent and normal to a curve at any point. Lengths of tangent, normal, subtangent and subnormal to the curve at any point . Angle between the curves - problems.
19. Physical applications of the derivative – velocity, acceleration, derivative as a rate Measure – Problems.
20. Applications of the derivative to find the extreme values – Increasing and decreasing functions, finding the maxima and minima of simple functions - problems leading to applications of maxima and minima.

21. Applications of derivative in finding errors and approximations of functions and simple problems.

Reference Books :

1. A text book of matrices by Shanti Narayan,
2. Plane Trigonometry, by S.L Loney
3. Co-ordinate Geometry, by S.L Loney
4. Thomas Calculus, Pearson Addison-Wesley publishers
5. Calculus – I, by Shanti Narayan and Manicavachgam Pillai, S.V Publications

ENGINEERING PHYSICS
(Common to all Branches)

Subject Title : Engineering Physics
Subject Code : CM -103
Periods per week : 04
Total periods per year : 120

TIME SCHEDULE

S.No	Major Topics	No. of Periods	Weightage of Marks	Short Answer Type	Essay Type
1.	Units and Dimensions	08	03	1	-
2.	Elements of Vectors	12	13	1	1
3.	Kinematics	12	13	1	1
4.	Friction	08	10	-	1
5.	Work, Power and Energy	10	10	-	1
6.	Simple Harmonic Motion	12	13	1	1
7.	Heat & Thermodynamics	12	13	1	1
8.	Sound	12	13	1	1
9.	Properties of matter	10	06	2	-
10.	Electricity & magnetism	14	13	1	1
11.	Modern Physics	10	03	1	-
	Total:	**120**	**103**	**10**	**8**

OBJECTIVES

Upon completion of the course the student shall be able to

1.0 Understand the concept of Units and dimensions

1.1 Explain the concept of Units
1.2 Define the terms
a) Physical quantity, b) Fundamental physical quantities and
c) Derived physical quantities
1.3 Define unit
1.4 Define fundamental units and derived units
1.5 State SI units with symbols
1.6 State Multiples and submultiples in SI system
1.7 State Rules of writing S.I. units
1.8 State advantages of SI units
1.9 Define Dimensions
1.10 Write Dimensional formulae
1.11 Derive dimensional formulae of physical quantities
1.12 List dimensional constants and dimensionless quantities
1.13 State the principle of Homogeneity of Dimensions
1.14 State the applications of Dimensional analysis

1.15 State the limitations of dimensional analysis

2.0 Understand the concept of Elements of Vectors

2.1 Explain the concept of Vectors
2.2 Define Scalar and Vector quantities
2.3 Give examples for scalar and vector quantities
2.4 Represent vectors graphically
2.5 Classify the Vectors
2.6 Resolve the vectors
2.7 Determine the Resultant of a vector by component method
2.8 Represent a vector in space using unit vectors (I, j, k)
2.9 State triangle law of addition of vectors
2.10 State parallelogram law of addition of vectors
2.11 Illustrate parallelogram law of vectors in case of flying bird and sling.
2.12 Derive expression for magnitude and direction of resultant of two vectors
2.13 State polygon law of addition of vectors
2.14 Explain subtraction of vectors
2.15 Define Dot product of two vectors with examples (Work done, Power)
2.16 Mention the properties of Dot product
2.17 Define Cross products of two vectors with examples (Torque, Linear velocity)
2.18 Mention the properties of Cross product.
2.19 Solve the related numerical problems

3.0 Understand the concept of Kinematics

3.1 Recapitulate the equations of motion in a straight line
3.2 Define acceleration due to gravity
3.3 Derive expressions for
a) Maximum Height, b) time of ascent, c) time of descent, and d) time of
3.4 Derive height of a tower when a body projected vertically upwards from the top of a tower.
3.5 Define projectile motion with examples
3.6 Explain Horizontal projection
3.7 Derive an expression for the path of a projectile in horizontal projection
3.8 Explain oblique projection
3.9 Derive an expression for the path of projectile in oblique projection
3.10 Derive formulae for
a)Horizontal Range, b)Maximum range of a projectile in oblique projection
3.11 Solve the related numerical problems

4.0 Understand the concept of Friction

4.1 Define friction
4.2 Classify the types of friction
4.3 Explain the concept of Normal reaction
4.4 State the laws of friction
4.5 Define coefficients of friction
4.6 Explain the Angle of friction
4.7 Derive an expression for acceleration of a body on a rough horizontal surface
4.8 Derive an expression for the displacement and time taken to come to rest over a rough horizontal surface
4.9 Define Angle of repose
4.10 Derive an expressions for acceleration of a body on a smooth inclined plane (up

and down)

4.11 Derive an expressions for acceleration of a body on a rough inclined plane (up and down)

4.12 List the Advantages and Disadvantages of friction

4.13 Mention the methods of minimizing friction

4.14 Solve the related numerical problems

5.0 Understand the concept of Work, Power, and Energy

5.1 Define work

5.2 State SI units and dimensional formula for work

5.3 Define power

5.4 State SI units and dimensional formula for power

5.5 Define energy

5.6 State SI units and dimensional formula for energy

5.7 Define potential energy

5.8 Derive the expression for Potential energy with examples

5.9 Define kinetic energy

5.10 Derive the expression for kinetic energy with examples

5.11 State the Work- Energy theorem

5.12 Explain the relation between Kinetic energy and momentum

5.13 State the law of conservation of energy

5.14 Verify the law of conversion of energy in the case of a freely falling body

5.15 Solve the related numerical problems

6.0 Understand the concept of Simple harmonic motion

6.1 Define Simple harmonic motion

6.2 State the conditions of Simple harmonic motion

6.3 Give examples for Simple harmonic motion

6.4 Show that the tip of the projection of a body moving in circular path with uniform speed is SHM

6.5 Derive expression for displacement

6.6 Derive expression for velocity

6.7 Derive expression for acceleration

6.8 Derive expression for Time period and frequency of S H M

6.9 Define phase of S H M

6.10 Derive expression for Time period of simple pendulum

6.11 State the laws of simple pendulum

6.12 State the laws of Seconds pendulum

6.13 Solve the related numerical problems

7.0 Understand the concept of Heat and thermodynamics

7.1 Explain the concept of expansion of gases

7.2 Explain Boyle' s law

7.3 State Charles law in terms of absolute temperature

7.4 Define absolute zero temperature

7.5 Explain absolute scale of temperature

7.6 Define ideal gas

7.7 Derive ideal gas equation

7.8 Define gas constant and Universal gas constant

7.9 Explain why universal gas constant is same for all gases

7.10 State SI unit of universal gas constant

7.11 Calculate the value of universal gas constant
7.12 State the gas equation in terms of density
7.13 Distinguish between r and R
7.14 Explain Isothermal process with the help of P-V and T-Ø diagram
7.15 Explain adiabatic process with the help of P-V and T-Ø diagram
7.16 Distinguish between isothermal and adiabatic process
7.17 State first and second laws of thermodynamics
7.18 Define specific heats & molar specific heats of a gas
7.19 Derive the relation $C_p - C_v = R$
7.20 Solve the related numerical problems

8.0 Understand the concept of Sound

8.1 Define the term sound
8.2 Explain longitudinal and transverse wave motion
8.3 Distinguish between musical sound and noise
8.4 Explain noise pollution and state SI unit for noise
8.5 Explain causes of noise pollution
8.6 Explain effects of noise pollution
8.7 Explain methods of minimizing noise pollution
8.8 Explain the phenomenon of beats
8.9 List the applications of beats
8.10 Define Doppler effect
8.11 List the Applications of Doppler effect
8.12 Explain reverberation and reverberation time
8.13 Write Sabine's formula
8.14 Explain echoes
8.15 State conditions of good auditorium
8.16 Solve the related numerical problems

9.0 Understand the properties of matter

9.1 Define the term Elasticity
9.2 Define the terms stress and strain
9.3 State the units and dimensional formulae for stress and strain
9.4 State the Hooke's law
9.5 Define the surface tension
9.6 Explain Surface tension with reference to molecular theory
9.7 Define angle of contact
9.8 Define the capillarity
9.9 Write the formula for surface tension based on capilarity
9.10 Explain the concept of Viscosity
9.11 Provide examples for surface tension and Viscosity
9.12 State Newton's formula for viscous force
9.13 Define co-efficient of viscosity
9.14 Explain the effect of temperature on viscosity of liquids and gases
9.15 State Poiseulle's equation for Co-efficient of viscosity
9.16 Solve the related numerical problems

10.0 Understand the concept of Electricity and Magnetism

10.1 Explain the concept of Electricity
10.2 State the Ohm's law

10.3 Explain the Ohm's law
10.4 Define specific resistance, conductance and their units
10.5 State Kichoff's laws
10.6 Explain Kichoff's laws
10.7 Describe Wheatstone's bridge with legible sketch
10.8 Derive expression for balancing condition of Wheatstone's bridge
10.9 Describe Meter Bridge with legible sketch
10.10 Write the formula in Meter Bridge to determine specific resistance
10.11 Explain the concept of magnetism
10.12 State the Coulomb's inverse square law of magnetism
10.13 Define magnetic field and magnetic lines of force
10.14 State the Magnetic induction field strength-units and dimensions
10.15 Derive Magnetic induction field strength at a point on the axial line
10.16 Describe the moment of couple on a bar magnet placed in a uniform magnetic field
10.17 Derive Magnetic induction field strength at a point on the equatorial line
10.18 Solve the related numerical problems

11.0 Understand the concept of Modern physics

11.1 Explain Photo-electric effect
11.2 Write Einstein's photoelectric equation
11.3 State laws of photoelectric effect
11.4 Explain the Working of photoelectric cell
11.5 List the Applications of photoelectric effect
11.6 Recapitulate refraction of light and its laws
11.7 Define critical angle
11.8 Explain the Total Internal Reflection
11.9 Explain the principle and working of Optical Fiber
11.10 Mention types of optical fibbers
11.11 List the applications of Optical Fiber
11.12 Define super conductor and superconductivity
11.13 List the examples of superconducting materials
11.14 List the applications of superconductors

COURSE CONTENT

1. Units and Dimensions:

Introduction – Physical quantity – Fundamental and Derived quantities – Fundamental and Derived units- SI units –Multiples and Sub multiples – Rules for writing S.I. units- Advantages of SI units – Dimensions and Dimensional formulae- Dimensional constants and Dimensionless quantities- Principle of Homogeneity- Advantages and limitations of Dimensional analysis- - Problems.

2. Elements of Vectors:

Scalars and Vectors –Types of vectors(Proper Vector, Null Vector, Unit Vector, Equal , Negative Vector, Like Vectors, Co-Initial Vectors, Co-planar Vectors and Position Vector).Addition of vectors- Representation of vectors- Resolution of vectors - Parallelogram, Triangle and Polygon laws of vectors–Subtraction of vectors- Dot and Cross products of vectors-Problems

3. Kinematics:

Introduction- Concept of acceleration due to gravity- Equations of motion for a freely falling body and for a body thrown up vertically- Projectiles- Horizontal and Oblique projections- Expressions for maximum height, time of flight, range - problems

4. Friction:

Introduction to friction- Causes- Types of friction- Laws of friction- Angle of repose- Angle of friction— Motion of a body over a horizontal surface- smooth inclined plane- rough inclined plane- Advantages and disadvantages of friction- Methods of reducing friction – Problems

5. Work, Power and Energy:

Work, Power and Energy- Definitions and explanation- potential energy- kinetic energy-Derivations of Potential and Kinetic energies-K.E and Momentum relation - Work-Energy theorem- Law of Conservation of energy- Problems

6. Simple Hormonic Motion:

Introduction- Conditions of SHM- Definition- Examples- Expressions for displacement, velocity, acceleration, Time period, frequency and phase in SHM- Time period of a simple pendulum- Laws of simple pendulum-seconds pendulum- Problems

7. Heat and Thermodynamics:

Expansion of Gases- Boyle's law- Absolute scale of temperature- Charles laws- Ideal gas equation- Universal gas constant- Differences between r and R- Isothermal and adiabatic processes- Laws of thermodynamics- Specific heats of a gas - Problems

8. Sound:

Sound- Nature of sound- Types of wave motion - usical sound and noise- Noise pollution – Causes & effects- Methods of reducing noise pollution- Beats- Doppler effect- Echo- Reverberation-Reverberation time-Sabine 's formula-Condition of good auditorium- Problems

9. **Properties of matter**

Definition of Elasticity –Definition of stress and strain -the units and dimensional formulae for stress and strain-The Hooke's law- Definition of surface tension- Explanation of Surface tension with reference to molecular theory - Definition of angle of contact - Definition of capillarity -The formula for surface tension based on capillarity - Explanation of concept of Viscosity - Examples for surface tension and Viscosity - Newton's formula for viscous force- Definition of co-efficient of viscosity- The effect of temperature on viscosity of liquids and gases - Poiseulle's equation for Co-efficient of viscosity- The related numerical problems

10. Electricity & Magnetism:

Ohm's law and explanation- Specific resistance- Kirchoff's laws- Wheatstone's bridge- Coulomb's inverse square law magnetic field- magnetic lines of force-Magnetic induction field strength- magnetic induction field strength at a point on the axial line - magnetic induction field strength at a point on the equatorial line –problems.

11. Modern Physics;

Photoelectric effect –Einstein's photoelectric equation-laws of photoelectric effect - photoelectric cell –Applications of photo electric effect- Total internal reflection- fiber optics- -principle and working of an optical fiber-types of optical fibers - Applications of optical fibers- concepts of superconductivity - applications

REFERENCE BOOKS

1. Intermediate physics Volume-I — Deepthi
2. Unified physics Volume 1,2,3 and 4 — Dr.S.L Guptha and Sanjeev Guptha
3. Text book of physics Volume I — Resnick & Holiday
4. Text book of applied physics — Dhanpath Roy
5. Fibre optics — D.A Hill

Blue Print for setting question paper at different levels

S.No	Major Topics	No. of Periods	Weightage of Marks	Short answer type			Essay type		
				K	U	A	K	U	A
1.	Units and Dimensions	08	03	1	0	0	0	0	0
2.	Elements of Vectors	12	13	0	0	1	0	1	0
3.	Kinematics	12	13	0	1	0	1	0	0
4.	Friction	08	10	0	0	0	0	1	0
5.	Work, Power and Energy	10	10	0	0	0	0	1	0
6.	Simple Harmonic Motion	12	13	0	0	1	0	1	0
7.	Heat & Thermodynamics	12	13	0	1	0	1	0	0
8.	Sound	12	13	0	1	0	0	0	1
9.	Properties of Matter	10	06	1	1	0	0	0	0
10.	Electricity & magnetism	14	13	0	1	0	0	1	0
11.	Modern Physics	10	03	1	0	0	0	0	0
	Total:	**120**	**110**	**3**	**5**	**2**	**2**	**5**	**1**

ENGINEERING CHEMISTRY & ENVIRONMENTAL STUDIES
((Common to all Branches)

Subject Title : Engineering Chemistry & Environmental Studies
Subject Code : CM -104
Total periods per year : 120

Blue Print

S.No	Major topic	No of Periods	Weightage of marks	Short type (3marks)			Essay type (10 marks)			remarks
				R	U	A	R	U	A	
A. ENGINEERING CHEMISTRY										
1	Fundamentals of Chemistry	18	16	1	0	1	0	1	0	
2	Solutions	10	8	1	0	0	0	0	1/2	5 mark
3	Acids and bases	10	8	0	0	1	0	1/2	0	5 mark
4	Principles of Metallurgy	10	10	0	0	0	1	0	0	
5	Electrochemistry	14	13	0	1	0	0	0	1	
6	Corrosion	8	10	0	0	0	0	1	0	
7	Water Technology	14	13	1	0	0	1	0	0	
8	Polymers	12	13	1	0	0	1	0	0	
9	Fuels	6	3	1	0	0	0	0	0	
B. ENVIRONMENTAL STUDIES		18	16	1	1	0	0	1	0	
	Total	120	110	6	2	2	3	3 1/2	1 1/2	
				18	6	6	30	35	15	

OBJECTIVES

Upon completion of the course the student shall be able to

A. ENGINEERING CHEMISTRY

1.0 Understand the concept of Atomic structure

1.1 Explain the fundamental particles of an atom like electron, proton and neutron etc.,

1.2 Explain the concept of atomic number and mass number

1.3 State the Postulates of Bohr's atomic theory and its limitations

1.4 Explain the concept of Quantum numbers with examples

1.5 Explain 1.Aufbau's principle, 2.Hund's rule and 3.Pauli's exclusion principle with respect to electron stability

1.6 Define Orbital in an atomic structure

1.7 Draw the shapes of s, p and d Orbitals in an atomic structure

1.8 Distinguish between Orbit and Orbital

1.9 Write the electronic configuration of elements up to atomic number 30

1.10 Explain the significance of chemical bonding

1.11 Explain the Postulates of Electronic theory of valance

1.12 Define the four types of Chemical bonding viz.,Ionic, Covalent, Coordinate and Metallic

1.13 Explain the four types of Chemical bonding viz.,Ionic, Covalent, Coordinate and Metallic

1.14 Explain bond formation in NaCl and MgO

1.15 List Properties of Ionic compounds

1.16 Explain bond formation in Hydrogen molecule, Oxygen molecule, and Nitrogen molecule using Lewis dot method

1.17 List Properties of Covalent compounds

1.18 Explain Metallic bond with Electron sea model theory

1.18 Define the terms 1.Oxidation, 2.Reduction and 3.Oxidation number

1.19 Calculate the Oxidation Number

1.20 Differentiate between Oxidation Number and Valence

2.0 Calculate Molarity, Molality and Normality of given Solution

2.1 Define the terms 1.Solution, 2.Solute and 3.Solvent

2.2 Classify solutions based on physical state and solubility

2.3 Define mole

2.4 Explain, with examples, the 'Mole concept'

2.5 Define the terms 1. Atomic weight, 2. Molecular weight and 3. Equivalent weight

2.6 Calculate Molecular weight and Equivalent weight of given Acids, Bases and Salts

2.7 Define 1.Molarity, 2. Molalty and 3.Normality of solutions

2.8 Explain with examples Normality

2.9 Solve Numerical problems on Mole, Molarity and Normality

3.0 Understand the concepts of Acids and bases

3.1 Explain Arrhenius theory of Acids and Bases

3.2 State the limitations of Arrhenius theory of Acids and Bases

3.3 Explain Bronsted – Lowry theory of acids bases

3.4 State the limitations of Bronsted – Lowry theory of acids bases

3.5 Explain Lewis theory of acids and bases

3.6 State the limitations Lewis theory of acids and bases

3.7 Explain the Ionic product of water

3.8 Define pH and explain Sorenson scale

3.9 Solve the Numerical problems on pH (Strong Acids and Bases)

3.10 Define buffer solution

3.11 Give the at least three examples foe buffer solutions

3.12 State the applications of buffer solution

4. 0 Understand the Principles of Metallurgy

4.1 List at least eight Characteristics of Metals

4.2 Distinguish between Metals and Non Metals

4.3 Define the terms 1.Mineral, 2.Ore, 3. Gangue, 4. Flux and 5. Slag

4.4 Describe the methods of concentration of ore like 1.Hand picking,2. Levigation, and 3. Froth

Floatation

4.5 Describe the methods involved in extraction of crude metal- Roasting, Calcination and Smelting.

4.6 Explain the purification of Metals by Electrolytic Refining

4.7 Define an Alloy

4.8 Write the Composition of the following alloys:1.Brass, 2.German silver, and Nichrome

4.9 List the uses of following Alloys: Brass, German silver, Nichrome

5.0 Understand the concepts of Electrochemistry

5.1 Define the terms1. conductor, 2. Insulator, 3.Electrolyte and 4.Non – electrolyte

5.2 Distinguish between metallic conduction and Electrolytic conduction

5.3 Explain Arrhenius theory of electrolytic dissociation

5.4 Explain electrolysis by taking example fused NaCl

5.5 Explain Faraday's laws of electrolysis

5.6 Define 1.Chemical equivalent and 2.Electrochemical equivalent

5.7 Solve the Numerical problems based on Faraday's laws of electrolysis

5.8 Define Galvanic cell

5.9 Explain the construction and working of Galvanic cell

5.10 Distinguish between electrolytic cell and galvanic cell

5.11 Explain the standard electrode potentials

5.12 Explain the electrochemical series and its significance

5.13 Explain the emf of a cell

5.14 Solve the numerical problems on emf of cell

6.0 Understand the concept of Corrosion

6.1 Define the term corrosion

6.2 Explain the Factors influencing the rate of corrosion

6.3 Explain the concept of electrochemical theory of corrosion

6.4 Describe the formation of a) composition cells, b) stress cells c) concentration cells

6.5 Explain the mechanism of rusting of iron

6.6 Explain the methods of prevention of corrosion: a) Protective coatings

b) Cathodic protection (Sacrificial anode process and Impressed – voltage process)

7. 0 Understand the concept of Water Technology

7.1 State the various Sources of water like Surface and sub surface sources

7.2 Define the terms soft water and hard water with respect to soap consumption

7.3 Define the term of hardness of water

7.4 Explain the various types of hardness of water like temporary and permanent hardness; and carbonate and bicarbonate hardness of water.

7.5 List the usual compounds causing hardness (with Formulae)

7.6 State the disadvantages of using hard water in industries

7.7 Define Degree of hardness, units of hardness (mg/L)

7.8 Explain the methods of softening of hard water: a) Ion-Exchange process, b)Reverse osmosis process(RO)

7.9 List the advantages of RO

7.10 State three essential qualities of drinking water like

1).Safety, 2). Economy and 3)..Aesthetic

8.0 Understand the concepts of Polymers

8.1 Explain the concept of polymerisation

8.2 Describe the methods of polymerisation a) addition polymerisation of Ethylene b) condensation polymerisation of phenol and formaldehyde (Only flow chart i.e. without chemical equations)

8.3 Define the term plastic

8.4 Classify the plastics with examples

8.5 Distinguish between thermo and thermosetting plastics

8.6 List the Characteristics of plastics

8.7 State the advantages of plastics over traditional materials

8.8 State the disadvantages of using plastics.

8.9 Explain the methods of preparation of the following plastics:

1. Polythene, 2. PVC, 3.Teflon, 4. Polystyrene and 5. Urea formaldehyde

8.9 Explain the uses of the following plastics:

1. Polythene, 2. PVC, 3.Teflon, 4. Polystyrene and 5. Urea formaldehyde

8.10 Define the term natural rubber

8.11 State the structural formula of Natural rubber

8.12 Explain the processing of Natural rubber from latex

8.13 List the Characteristics of natural rubber

8.14 Explain the process of Vulcanization

8.15 List the Characteristics of Vulcanized rubber

8.16 Define the term Elastomer

8.17 Describe the preparation of the following synthetic rubbers a) Butyl rubber, b) Buna-s and c) Neoprene rubber

8.18 List the uses of the following synthetic rubbers a) Butyl rubber, b) Buna-s and c) Neoprene rubber

9.0 Understand the concepts of Fuels

9.1 Define the term fuel

9.2 Classify the fuels based on physical state – solid, liquid and gaseous fuels,

9.3 Classify the fuels based on occurrence- primary and secondary fuels

9.4 List the characteristics of good fuel

9.5 State the composition and uses of gaseous fuels:
a) water gas, b) producer gas, c) natural gas, d) coal gas, e) Bio gas and f) acetylene

B. ENVIRONMENTAL STUDIES

1.1 Define the term environment

1.2 Explain the scope and importance of environmental studies

1.3 Explain the following terms 1).Lithosphere, 2).Hydrosphere, 3).Atmosphere, 4).Biosphere, 5)Pollutant, 6).Pollution, 7).Contaminant receptor - sink, particulates, dissolved oxygen, 8).Threshold limit value, 9).BOD, and 10).COD

1.4 Explain the growing energy needs

1.5 State the differences between renewable and non renewable energy sources- alternative energy sources.

1.6 Define an Ecosystem- biotic component, abiotic component and energy component,

1.7 Define the terms:
1).Producers, 2).Consumers and 3).Decomposers with examples.

1.8 Explain biodiversity and threats to biodiversity

1.9 Define air pollution

1.10 Classify the air pollutants- based on origin and state of matter

1.11 Explain the causes of air pollution

1.12 Explain the use and over exploitation of forest resources and deforestation

1.13 Explain the effects of air pollution on human beings, plants and animals

1.14 Explain the green house effect - ozone layer depletion and acid rain

1.15 Explain the methods of control of air pollution

1.16 Define water pollution

1.17 Explain the causes of water pollution

1.18 Explain the effects of water pollution on living and non living things

1.19 Understand the methods of control of water pollution.

COURSE CONTENT

A. ENGINEERING CHEMISTRY

1. Fundamentals of Chemistry

Atomic Structure: Introduction - Fundamental particles – Bohr's theory – Quantum numbers - Aufbau principle - Hand's rule - Pauli's exclusion Principle- Orbitals, shapes of s, p and d orbitals - Electronic configurations of elements

Chemical Bonding: Introduction – types of chemical bonds – Ionic and covalent bond with examples – Properties of Ionic and Covalent compounds
– Metallic bond

Oxidation-Reduction: Concepts of Oxidation-Reduction, Oxidation Number-calculations, differences between Oxidation Number and Valency

2. Solutions

Introduction-concentration methods – Mole concept, Molarity, Normality, Equivalent weights, Numerical problems on Mole, Molarity and Normality

3. Acids and Bases

Introduction – theories of acids and bases and limitations – Arrhenius theory-Bronsted –Lowry theory – Lewis acid base theory – Ionic product of water – pH and related numerical problems – buffer solutions –Applications.

4. Principles of Metallurgy

Characteristics of Metals and distinctions between Metals and Non Metals, Metallurgy, ore, Gangue, Flux, Slag - Concentration of Ore –Hand picking, Levigation, Froth floatation – Methods of Extraction of crude Metal – Roasting, Calcination, Smelting – Alloys – Composition and uses of Brass, German silver and Nichrome

5. Electrochemistry

Conductors, insulators, electrolytes - Arrhenius theory of electrolytic dissociation – electrolysis – Faraday's laws of electrolysis- numerical problems – Galvanic cell – standard electrode potential – electro chemical series –emf and numerical problems on emf of a cell

6. Water technology

Introduction –soft and hard water – causes of hardness – types of hardness
–disadvantages of hard water – degree of hardness (ppm) – softening methods – permutit process – ion exchange process – numerical problems related to degree of hardness – drinking water – municipal treatment of water for drinking purpose – Osmosis, Reverse Osmosis - advantages of Reverse osmosis

7. Corrosion

Introduction - factors influencing corrosion - electrochemical theory of corrosion - composition, stress and concentration cells– rusting of iron and its mechanism – prevention of corrosion by coating methods, cathodic protection

8. Polymers

Introduction – polymerization – types of polymerization – addition, condensation with examples – plastics – types of plastics – advantages of plastics over traditional materials – Disadvantages of using plastics – preparation and uses of the following plastics: 1. Polytehene 2. PVC 3. Teflon 4. Polystyrene 5. Urea formaldehyde – Rubber – Natural rubber – processing from latex –Vulcanization – Elastomers – Butyl rubber, Buna-s, Neoprene rubber and their uses.

9. Fuels

Definition and classification of fuels – characteristics of good fuel - composition and uses of gaseous fuels.

B. ENVIRONMENTAL STUDIES

Introduction – environment –scope and importance of environmental studies important terms – renewable and non renewable energy sources – Concept of ecosystem, producers, consumers and decomposers – Biodiversity, definition and threats to Biodiversity.

air pollution - causes-Effects – forest resources : uses and over exploitation, deforestation, acid rain, green house effect –ozone depletion – control of air pollution – Water pollution – causes – effects – control measures,

REFERENCE BOOKS

1.	Intermediate chemistry Vol 1&2	Telugu Acedemy
2.	Intermediate chemistry Vol 1&2	Vikram Publishers
3.	Intermediate chemistry Vol 1&2	Vignan Publishers & Deepthi Publishers
4.	Engineering Chemistry	Jain & Jain
5.	Engineering Chemistry	O.P. Agarwal, Hi-Tech.
6.	Engineering Chemistry	Sharma
7.	Engineering Chemistry	A.K. De

BASICS OF COMPUTER ENGINEERING

Subject : Basics of Computer Engineering
Subject Code : CM - 105
Periods per Week : 4
Periods per Year : 120

Objectives
Upon completion of the course the student shall be able to

1.0 Understand Fundamentals of Computer

1.1. Define various terms related to computers – Computer, Hardware , Software, Firmware, High Level Language , Low Level Language
1.2. Draw the block diagram of a Computer.
1.3. Describe the interaction between the CPU, Memory, Input / Output devices
1.4. Describe the function of CPU and major functional parts of CPU
1.5. Describe the function of memory.
1.6. Describe the function of input/output devices.
1.7. State the relevance of speed and word length for CPU Performance.
1.8. Recognize the current family of CPUs used in Computers.
1.9. State the use of storage devices used in a Computer.
1.10. List the two types of memory used in a Computer.
1.11. State the importance of cache memory.
1.12. Explain the generations of computers.
1.13. Give the classification of computers - based on a) size, b) processor.
1.14. State the importance of binary number system for use in Digital Computers

2.0 Implement Programming Methodology.

2.1. State the different steps involved in problem solving.
2.2. Define algorithm.
2.3. List four characteristics of algorithm.
2.4. Define a program
2.5. Differentiate between program and algorithm.
2.6. State the steps involved in algorithm development.
2.7. Differentiate algorithm and flowchart.
2.8. Develop algorithms for simple problems.
2.9. Draw the symbols used in flowcharts.
2.10. Draw flowcharts for simple problems.

3.0 Understand Number systems

3.1. List the various number systems used in digital Computer.
3.2. Convert decimal number into binary number.
3.3. Convert binary number into decimal number.
3.4. Convert binary number into hexadecimal number.
3.5. Convert hexadecimal number into binary number.
3.6. Explain the ASCII coding scheme.
3.7. Explain the EBCDIC coding scheme.

4.0 Understand DOS Operating Systems

4.1. Describe the need for an operating system.

4.2. List the various operating systems used presently.
4.3. DOS Prompt.
4.4. Classify DOS commands
4.5. List and explain atleast 10 Internal Commands
4.6. List and explain atleast 5 External Commands
4.7. Explain directories and files
4.8. Know wild card characters
4.9. Describe Autoexec.bat and config.sys files

5.0 Understand Windows Operating Systems

5.1. List the features of Windows desktop.
5.2. List the components of a Window.
5.3. State the function of each component of a Window.
5.4. Explain the Method of starting a program using start button
5.5. Explain usage of maximize, minimize, restore down and close buttons.
5.6. State the meaning of a file.
5.7. State the meaning of a folder.
5.8. Explain the Method of viewing the contents of hard disk drive using Explorer
5.9. Explain the Method of finding a file using search option.
5.10. Describe installing new software using control panel
5.11. Describe uninstalling software using control panel
5.12. Explain installing a new hardware using control panel
5.13. Explain uninstalling a hardware using control panel
5.14. Narrate finding out drive space using system tool option of Accessories group
5.15. Explain the procedure of disk defragmentation using System tools
5.16. Narrate installing a printer using control panel
5.17. Explain the procedure for changing resolution, color, appearance, screensaver options of the display
5.18. Narrate the process of changing the system date and time

6.0 Understand Features of Internet

6.1. Explain meaning of a computer network.
6.2. Describe the concept of a local area network.
6.3. Explain the concept of the wide area network
6.4. Compare Internet and Intranet
6.5. Describe the relevance of an internet service provider.
6.6. Explain the role of a modem in accessing the Internet.
6.7. Explain the installation procedure of a MODEM using control panel
6.8. Explain the purpose of web browser software.
6.9. Explain the structure of a Universal Resource Locator (URL).
6.10. Describe the purpose of World Wide Web, FTP, telnet and E-mail
6.11. Explain the process of sending and receiving E-mail
6.12. Describe address format and IP address
6.13. Describe DNS
6.14. Explain the role of search engines with examples.
6.15. Describe DHCP
6.16. Describe Social Network sites.
6.17. Describe Internet Security.

7.0 Understand Current Technologies in Computers

7.1. Introduction to Datastructure

7.1.1. Define Datastructure
7.1.2. Classify Datastructure

7.2. Introduction to Database Management Systems
7.2.1. Define terms Database and Database Management Systems
7.2.2. List Advantages of Database systems
7.2.3. Distinguish between Flat file database and Relational Database systems
7.2.4. List various existing Database systems

7.3. Introduction to Software Engineering
7.3.1. Define Software engineering
7.3.2. Need for software engineering
7.3.3. List different life cycle models in software engineering

7.4. Introduction to Open Source Soft wares
7.4.1. Define Open source soft wares
7.4.2. List any five open source soft wares

7.5. Introduction to System Administration
7.5.1. List any five Networking operating systems
7.5.2. Define client and server
7.5.3. List and explain any five features of Networking operating system
7.5.4. Differentiate between Networking O.S. and Desktop O.S.
7.5.5. Define file system
7.5.6. List and explain file systems available FAT, FAT32 and NTFS

8.0 Understand Emerging Trends in Computer Technology

8.1. Introduction to Cloud Computing
8.1.1. Define Cloud
8.1.2. Use of Cloud
8.1.3. Types of Cloud
8.1.4. Explain cloud components with a diagram
8.1.5. List any five applications of cloud computing

8.2. Introduction to Network Security
8.2.1. Define Virus
8.2.2. Define Worm
8.2.3. Define Cyber Crime
8.2.4. Need for Network Security
8.2.5. Know about Encryption

8.3. Introduction to Mobile Communication
8.3.1. Define Wireless communication
8.3.2. Define Cellular Systems
8.3.3. Define GSM and CDMA
8.3.4. Define Wireless LAN and Bluetooth

COURSE CONTENT

1.0 Fundamentals of Digital Computer

Block diagram of a digital computer, functional parameters of CPU, Clock speed and word length, Functional blocks of a CPU: ALU and Control unit, types of memory RAM, ROM, purpose of cache memory

2.0 Programming Methodology.

Steps involved in problem solving - Define algorithm , Program - Characteristics of algorithm - Differentiate between program and algorithm- Steps involved in algorithm

development - Differentiate algorithm and flowchart - Algorithms for simple problems - Symbols used in flowcharts -Flowcharts for simple problems.

3.0 Number system

Binary Number system, Decimal, Binary, hexadecimal and octal codes, Conversion from one number system to another number system, ASCII, BCD and EBCDIC code for characters, concept of a byte and word.

4.0 DOS Operating Systems

Need for an operating system - List the various operating systems - Prompt, Types of commands, Internal & External Commands - Directories and files, wild cards, autoexec.bat, config.sys

5.0 Windows Operating Systems

Features of Windows desktop - Components of a Window - Function of each component of a Window - Method of starting a program using start button -Maximize, minimize, restore down and close buttons- Meaning of a file and flolder -Viewing the contents of hard disk drive using explorer -Finding a file - Formatting a floppy disk using explore option - Installing and uninstalling new software using control panel - installing and un inistalling a new hardware using control panel - Drive space - disk defragmentation - Installing a printer - Changing resolution, colour, appearance and screensaver options of the display - Changing the system date and time

6.0 Features of Internet

Computer network -Local area network - Wide area network - Compare Internet & Intranet - Internet service provider- Role of a modem in accessing the Internet- Installation of a MODEM using control panel - Web browser software - Structure of a Universal Resource Locator - World Wide Web, FTP, telnet and E-mail -Sending and receiving E-mail - Connection methods - Address format and IP address - DNS – DHCP- role of search engines with examples- Differences between search engines and directory - Social Network sites - Internet Security

7.0. Current Technologies in Computers

Introduction to Data structure - Introduction to Database Management System Introduction to Software Engineering - Introduction to Open Source Software -Introduction to System Administration

8.0 Emerging Trends in Computer Technology

Introduction to Cloud Computing - Introduction to Network Security - Introduction to Mobile Communication

REFERENCE BOOKS

1. Information Technology - Curtin.
2. Computer Science Theory & Application - E. Balaguruswamy, B. Sushila
3. Introduction to Computers (Special Indian Edition) - Peter Norton

PROGRMMING IN C

Subject : Programming in C
Subject Code : CM - 106
Periods per Week : 5
Periods per Year : 180

TIME SCHEDULE AND BLUE PRINT										
Unit No	**Major Topic**	**No of Periods**		**Weightage of marks**	**Short Type**			**Essay Type**		
		Theory	**Practice**		R	**U**	**App**	R	U	**App**
1	Introduction to C Language	4	0	3	1	0	0	0	0	0
2	Constants, Variables and Data Types in C	4	1	3	1	0	0	0	0	0
3	Operators and Expressions in C	4	6	5	0	0	0	0	0	½
4	Managing Input and Output Operations	2	2	3	0	0	1	0	0	0
5	Decision making	3	8	13	0	0	1	0	0	1
6	Looping concepts	3	8	13	0	0	1	0	0	1
7	Arrays	5	10	13	0	1	0	0	0	1
8	Strings	2	4	3	0	1	0	0	0	0
9	User defined functions	**20**		**18**	**1**			**1½**		
	Functions	6	10	13	1	0	0	0	1	0
	Scope , visibility and lifetime	4	0	5	0	0	0	½	0	0
10	Basics of Pointers	4	8	13	0	1	0	0	1	0
11	Basics of Structures and Unions	6	4	10	0	0	0	½	½	0
12	Basics of Files management and Preprocessor directives	**12**		**13**	**1**			**1**		
	File management	6	3	10	0	0	0	0	1	0
	Preprocessor directives	2	1	1	1	0	0	0	0	0
	Total	**55**	**65**	**110**	**4**	**3**	**3**	**1**	**3 ½**	**3 ½**

Objectives
Upon completion of the course the student shall be able to

1.0 Introduction to C Language

1.1 Define High level language and low level language
1.2 Describe the history of C language
1.3 State the importance of C language
1.4 Explain the structure of C language
1.5 Describe the programming style of C language
1.6 Explain the steps involved in executing the C program

2.0 Understand Constants, Variables and Data Types in C

2.1 Describe character set.
2.2 Explain C Tokens
2.3 Describe Keywords and Identifiers
2.4 Explain Constants and Variables
2.5 Define Data type
2.6 Classify data types and explain them with examples.
2.7 Explain declaration of a variable
2.8 Explain assigning values to variables

3.0 Understand Operators and Expressions in C

3.1 Define an operator
3.2 Define an expression
3.3 Classify operators
3.4 Explain various arithmetic operators with examples
3.5 Illustrate the concept of relational operators
3.6 Explain logical operators
3.7 Describe various assignment operators
3.8 Illustrate nested assignment
3.9 Describe increment and decrement operators
3.10 Illustrate conditional operator
3.11 Explain bitwise operators
3.12 Explain special operators
3.13 Illustrate arithmetic expressions
3.14 Describe precedence and associativity of operators
3.15 Describe evaluation of expressions
3.16 Illustrate type conversion techniques and discuss them

4.0 Understand Input and Output Operations

4.1 Illustrate reading a character using getchar()
4.2 Illustrate writing a character using putchar()
4.3 Illustrate formatted input using scanf()
4.4 Write sample programs for formatted input using scanf()
4.5 Describe formatted output with example programs
4.6 Write sample programs for formatted output using printf()
4.7 Illustrate Preprocessor Directive #include

5.0 Understand Decision making

5.1 Discuss decision making in programming
5.2 Explain decision making statements
5.3 Describe relational operators with their precedence
5.4 Explain logical operators and their precedence
5.5 Explain how to evaluate a logical expression.
5.6 Discuss about simple if statement with syntax and sample program
5.7 Discuss about nested if..else statements with syntax and sample program
5.8 Discuss about else if ladder with syntax and sample program
5.9 State the importance of indentation
5.10 Discuss about switch statement with syntax and sample program
5.11 Illustrate conditional operator

6.0 Understand Looping concepts

6.1 Define looping

6.2 List atleast three loop statements
6.3 Explain while statement with syntax and sample program
6.4 Explain do.. while statement with syntax and sample program
6.5 Explain 'for' loop statement with syntax and sample program
6.6 Define nesting of loops and implement it
6.7 Compare different loop statements
6.8 Differentiate break and continue statements.
6.9 Define structured programming

7.0 Understand Arrays

7.1 Define Array
7.2 Describe declaration and initialization of One Dimensional Array with syntax and sample program
7.3 Explain accessing the elements in the Array with sample program
7.4 Explain reordering an array in ascending order
7.5 Explain declaration and initialization of two Dimensional Arrays.
7.6 Illustrate the concept of arrays with sample programs on matrix addition and matrix multiplication

8.0 Understand Strings

8.1 Define String
8.2 Know about declaration and initialization of a String variables.
8.3 Know about reading of strings from terminal with sample program
8.4 Know about writing strings to screen with sample program
8.5 Explain about various String handling functions with sample programs.
8.6 Explain Arithmetic operations on Characters

9.0 Understand User defined functions

9.1 Define function.
9.2 State the need for user defined functions
9.3 Discuss the advantages of functions
9.4 Discuss the elements of function
9.5 Discuss about return values and their types
9.6 Define a function call
9.7 Define function prototype
9.8 Illustrate function declaration in programs
9.9 Discuss and illustrate functions with no arguments and no return values with sample programs
9.10 Discuss and illustrate functions with arguments with no return values with sample programs
9.11 Discuss and illustrate functions with arguments with return values with sample programs
9.12 Discuss and illustrate functions with no arguments with return values with sample programs
9.13 Illustrate functions that return multiple values with sample programs
9.14 Define recursion
9.15 Illustrate recursion with sample programs
9.16 Illustrate passing arrays to functions with sample programs
9.17 Discuss the scope, visibility and lifetime of variables in functions
9.18 Differentiate Local and External variables
9.19 Define Global variable

9.20 Discuss passing the global variables as parameters using sample programs

10.0 Understand basics of Pointers

10.1 Define Pointer
10.2 Illustrate declaration and initialization of Pointers.
10.3 Illustrate accessing the address of a variable using & operator
10.4 Illustrate accessing a value of a variable through pointer
10.5 Differentiate between address and de-referencing operators.
10.6 Discuss about pointer arithmetic.
10.7 Illustrate precedence of address and de-referencing operators.
10.8 Discuss on pointer comparison and pointer conversion.
10.9 Illustrate relationship between arrays and pointers.
10.10 Illustrate accessing array elements using pointers
10.11 Illustrate use of pointers as function arguments
10.12 Discuss pointer arrays with examples.
10.13 Explain dynamic memory management functions and illustrate with examples to use these functions.

11.0 Understand basics of Structures and Unions

11.1 Define a structure.
11.2 Illustrate creating a structure
11.3 Illustrate declaring structure variables
11.4 Explain accessing of the structure members
11.5 Explain array of structures
11.6 Illustrate concept of structure assignment.
11.7 Explain how to find size of a structure.
11.8 Discuss nested structure concept.
11.9 Illustrate use of pointer to structure.
11.10 Illustrate structure as function arguments and structures as function values.
11.11 Illustrate the Structures containing arrays, arrays of structures containing arrays
11.12 Illustrate concept of structures containing pointers.
11.13 Explain Self referential structures with examples.
11.14 Define Union and illustrate use of a union.
11.15 Differences between Structures and Union

12.0 Understand basics of Files management and Preprocessor directives

6.1 Define file
6.2 Know how to declare file pointer to a file
6.3 Illustrate the concept of file opening in various modes
6.4 Illustrate the concept of closing of a file
6.5 Illustrate the concept of Input / Output operations on a file
6.6 Illustrate the concept of random access to files
6.8 State the need of Preprocessor directives
6.9 Explain Preprocessor directives
6.10 Explain macro substitution using #define with an example

COURSE CONTENT

1. **Introduction to C Language**
   Define High level language and low level language-history of C language - importance of C language - structure of C language - programming style of C language - steps involved in executing the C program

2. **Understand Constants, Variables and Data Types in C**
   character set - C Tokens - Keywords and Identifiers- Constants and Variables - data types and classification - declaration of a variable - Assigning values to variables
3. **Understand Operators and Expressions in C**
   Define an operator - Define an expression -Classify operators - List and explain various arithmetic operators with examples -Illustrate the concept of relational operators - List logical operators - various assignment operators - Nested assignment - Increment and decrement operators - Conditional operator - List bitwise operators - List various special operators- Arithmetic expressions- precedence and associativity of operators- Eevaluation of expressions - Various type conversion techniques and discuss them.
4. **Managing Input and Output Operations**
   reading and writing characters - formatted input and output -Preprocessor Directive #include
5. **Understand Decision making**
   Decision making in programming - Relational operators with their precedence - Logical operators and their precedence -Evaluate a logical expression - simple if statement with sample program

6 **Understand Looping concepts**
Classification of various loop statements- while statement – do.. while statement ram - for loop statement - nesting of loops- Comparisons of different loop statements - break and continue statements - structured programming

7 **Understand Arrays**
Arrays -declaration and initialization of One Dimensional -Array -Accessing the elements in the Array - Reordering an array in ascending order - Declaration and initialization of two Dimensional Arrays - sample programs on matrix addition and matrix multiplication

8 **Understand Strings**
Strings - Declaration and initialization of a String variables - Reading of strings from terminal - writing strings to screen - String handling functions with sample programs - Arithmetic operations on Characters

9 **Understand User defined functions**
Function -Need for user defined functions - Advantages of functions - elements of function - Return values and their types - function call - function prototype - Functions with no arguments and no return values - functions with arguments with no return values - functions with arguments with return values - functions with no arguments with return values - functions that return multiple values
Recursion - sample programs on recursion - passing arrays to functions
Scope, visibility and lifetime of variables in functions- Local and External variables - Global variable- passing the global variables as parameters

10 Understand basics of Pointers

Pointer - Declaration and Initialization of Pointers- Accessing the address of a variable using & operator- Accessing a value of a variable through pointer - Differentiate address and de-referencing operators - Pointer Arithmetic- precedence of address and de-referencing operators - pointer comparison and pointer conversion -Relationship between Arrays and Pointers - Accessing array elements using pointers- Pointers as Function Arguments - Discuss pointer Arrays with examples- Dynamic memory management functions

11 Understand basics of Structures and Unions

Structure- Creating a structure - Declaring structure variables -Accessing the structure members - Array of structures - Concept of structure assignment -Find size of a structure - Nested structure concept - Concept of pointer to structure - Structure as function arguments and structures as function values - Structures containing arrays, arrays of structures containing arrays - Concept of structures containing pointers - Self referential structures with examples - Union and illustrate use of a union – difference between Structures and Union

12 Understand basics of Files management and Preprocessor directives

File - Declare file pointer to a file - file opening in various modes - Concept of closing of a file - Input / Output operations on a file - Random access to files - Need of Preprocessor directives - Various Preprocessor directives- Macro substitution using #define

REFERENCE BOOKS

1	Programming in ANSI C	E. Balaguruswamy	Tata McGrawHill
2	Programming with C	Gottfried	Schaum'outline Tata McGraw Hill
3	C The complete Reference	Schildt	Tata McGraw Hill

ENGINEERING DRAWING

Subject Title : Engineering Drawing
Subject Code : CM–107
Periods/Week : 06
Periods Per Year : 180

TIME SCHEDULE

S.No	Major Topics	No. of Drawing plates	Periods	Weightage of Marks	Short Answer Questions	Essay type Questions
1	Importance of Engineering Drawing	--	01	-	-	-
2	Engineering Drawing Instruments	01	05	-	-	-
3	Free hand lettering & Numbering	01	06	5	1	-
4	Dimensioning Practice	01	09	5	1	-
5	Geometrical constructions	03	21	15	1	1
6	Projection of points, Lines, Planes & Solids	03	21	10	-	1
7	Auxiliary views	01	06	5	1	-
8	Sectional views	01	27	10	-	1
9	Orthographic Projection	01	33	10	-	1
10	Pictorial drawing	01	30	10	-	1
11	Development of surfaces	01	21	10	-	1
Total		**14**	**180**	**80**	**04**	**06**

The Course is aimed at developing basic graphic skills so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation

Pre-Requisite: Clear visualization and sound pictorial intelligence

OBJECTIVES
Upon completion of the subject the student shall be able to

1.0 Understand the basic concepts of Engineering Drawing

1.1 State the importance of drawing as an engineering communication medium
1.2 State the necessity of B.I.S. Code of practice for Engineering Drawing.
1.3 Explain the linkages between Engineering drawing and other subjects of study in diploma course.

2.0 Use of Engineering Drawing Instruments

2.1 Select the correct instruments and draw lines of different orientation.
2.2 Select the correct instruments and draw small and large Circles.
2.3 Select the correct instruments for measuring distances on the drawing.
2.4 Use correct grade of pencil for different types of lines, thickness and given function.
2.5 Select and use appropriate scales for a given application.
2.6 Identify different drawing sheet sizes as per I.S. and Standard Lay- outs.
2.7 Prepare Title block as per B.I.S. Specifications.
2.8 Identify the steps to be taken to keep the drawing clean and tidy.

Drawing Plate 1: (Having two exercises)

3.0 Write Free Hand Lettering and Numbers

3.1 Write titles using sloping lettering and numerals of 7mm, 10mm and 14mm height
3.2 Write titles using vertical lettering and numerals of 7mm, 10mm and 14mm height
3.3 Select suitable sizes of lettering for different layouts and applications
3.4 Practice the use of lettering stencils.

Drawing plate 2: (Having 5 to 6 exercises)

4.0 Understand Dimensioning Practice

4.1 Define “Dimensioning.
4.2 State the need of dimensioning the drawing according to accepted standard.
4.3 Identify notations of Dimensioning used in dimensioned drawing.
4.4 Identify the system of placement of dimensions in the given dimensioned drawing.
4.5 Dimension a given drawing using standard notations and desired system of dimensioning.
4.6 Dimension standard features applying necessary rules.
4.7 Arrange dimensions in a desired method given in a drawing.
4.8 Identify the departures if any made in the given dimensioned drawing with reference to SP-46-1988, and dimension the same correctly.

Drawing Plate 3: (Having 08 to10 exercises)

5.0 Apply Principles of Geometric Constructions

5.1 Divide a given line into desired number of equal parts internally.
5.2 Draw tangent lines and arcs.
5.3 Use General method to construct any polygon.
5.4 Explain the importance of conics
5.5 Construct conics (ellipse, parabola and hyperbola) by general method
5.6 Construct ellipse by concentric circles method
5.7 Construct parabola by rectangle method
5.8 Construct rectangular hyperbola from the given data.
5.9 Construct involute from the given data.
5.10 Construct cycloid and helix from the given data.
5.11 State the applications of the above constructions in engineering practice.

Drawing Plate -4: Having problems up to construction of polygon
Drawing Plate -5: Having problems of construction of conics
Drawing Plate -6: Having problems of construction of involute, cycloid and helix

6.0 Apply Principles of Projection of points, lines, planes & solids

- 6.1 Visualize the objects
- 6.2 Explain the I-angle and III-angle projections
- 6.2 Practice the I-angle projections
- 6.3 Draw the projection of a point with respect to reference planes (HP&VP)
- 6.4 Draw the projections of straight lines with respect to two reference Planes (up to lines parallel to one plane and inclined to other plane)
- 6.5 Draw the projections of planes (up to planes perpendicular to one plane and inclined to other plane)
- 6.6 Draw the projections of solids (up to axis of solids parallel to one plane and inclined to other plane)

Drawing Plate -7: Having problems up to projection of points and Lines (15 exercises)
Drawing Plate -8: Having problems of projection of planes (6 exercises)
Drawing Plate -9: Having problems of projection of solids (10 exercises)

7.0 Understand the need of auxiliary views

- 7.1 State the need of Auxiliary views for a given engineering drawing.
- 7.2 Draw the auxiliary views of a given engineering component
- 7.3 Differentiate between auxiliary view and apparent view

Drawing plate No.10: (Having 4 exercises)

8.0 Appreciate the need of Sectional Views

- 8.1 Explain the need to draw sectional views.
- 8.2 Select the section plane for a given component to reveal maximum information.
- 8.3 Explain the positions of section plane with reference planes
- 8.4 Differentiate between true shape and apparent shape of section
- 8.5 Draw sectional views and true sections of regular solids discussed in **6.0**
- 8.6 Apply principles of hatching.

Drawing Plate–11: Having problems of section of solids (6 exercises)

9.0 Apply principles of orthographic projection

- 9.1 Explain the principles of orthographic projection with simple sketches.
- 9.2 Draw the orthographic view of an object from its pictorial drawing.
- 9.3 Draw the minimum number of views needed to represent a given object fully.

Drawing Plate 12 : (Having 10 to 12 exercises)

10.0 Prepare pictorial drawings

- 10.1 State the need of pictorial drawings.
- 10.2 Differentiate between isometric scale and true scale.
- 10.3 Prepare Isometric views for the given orthographic drawings.

Drawing plate 13: (Having 10 to 12 exercises)

11.0 Interpret Development of surfaces of different solids

11.1 State the need for preparing development drawing.

11.2 Prepare development of simple engineering objects (cubes, prisms, cylinders, cones, pyramid) using parallel line and radial line method.

11.3 Prepare development of surface of engineering components like trays, funnel, 90^0 elbow & rectangular duct.

Drawing plate No. 14: (Having 05 exercises)

Competencies and Key competencies to be achieved by the student

S.No	Major topic	Key Competency
1.	Importance of Engineering Drawing	• Explain the linkages between Engineering drawing and other subjects of study in Diploma course.
2.	Engineering Drawing Instruments	• Select the correct instruments to draw various entities in different orientation
3.	Free hand lettering & Numbering	• Write titles using sloping and vertical lettering and numerals as per B.I.S (Bureau of Indian standards)
4.	Dimensioning Practice	• Dimension a given drawing using standard notations and desired system of dimensioning
5.	Geometrical construction	• Construct ellipse, parabola, rectangular hyperbola, involute, cycloid and helix from the given data.
6.	Projection of points, Lines, Planes & Solids	• Draw the projection of a point, straight lines, planes & solids with respect to reference planes (HP& VP)
7.	Auxiliary views	• Draw the auxiliary views of a given Engineering component • Differentiate between Auxiliary view and apparent view
8.	Sectional views	• Differentiate between true shape and apparent shape of section • Use conventional representation of Engineering materials as per B.I.S. Code. • Apply principles of hatching. • Draw simple sections of regular solids
9.	Orthographic Projection	• Draw the minimum number of views needed to represent a given object fully.
10.	Pictorial drawing	• Differentiate between isometric scale and true scale. • Draw the isometric views of given objects,.
11.	Development of surfaces	• Prepare development of Surface of Engineering components like trays, funnel, 90^0 elbow & rectangular duct.

COURSE CONTENT

NOTE

1. **B.I.S Specification should invariably be followed in all the topics.**
2. **A-3 Size Drawing Sheets are to be used for all Drawing Practice Exercises.**

1.0 The importance of Engineering Drawing

Explanation of the scope and objectives of the subject of Engineering Drawing Its importance as a graphic communication -Need for preparing drawing as per standards – SP-46 –1988 – Mention B.I.S - Role of drawing in -engineering education – Link between Engineering drawing and other subjects of study.

2.0 Engineering drawing Instruments

Classifications: Basic Tools, tools for drawing straight lines, tools for curved lines, tools for measuring distances and special tools like mini drafter & drafting machine – Mentioning of names under each classification and their brief description -Scales: Recommended scales reduced & enlarged -Lines: Types of lines, selection of line thickness - Selection of Pencils -Sheet Sizes: A0, A1, A2, A3, A4, A5, Layout of drawing sheets in respect of A0, A1, A3 sizes, Sizes of the Title block and its contents - Care and maintenance of Drawing Sheet, Drawing plate:

Lay out of sheet – as per SP-46-1988 to a suitable scale.

Simple Exercises on the use of Drawing Instruments. Importance of Title Block.

3.0 Free hand lettering & numbering

Importance of lettering – Types of lettering -Guide Lines for Lettering
Practicing of letters & numbers of given sizes (7mm, 10mm and 14mm)
Advantages of single stroke or simple style of lettering - Use of lettering stencils

4.0 Dimensioning practice

Purpose of engineering Drawing, Need of B.I.S code in dimensioning -Shape description of an Engineering object -Definition of Dimensioning size description -Location of features, surface finish, fully dimensioned Drawing - Notations or tools of dimensioning, dimension line extension line, leader line, arrows, symbols, number and notes, rules to be observed in the use of above tools -Placing dimensions: Aligned system and unidirectional system (SP-46-1988)-Arrangement of dimensions Chain, parallel, combined progressive, and dimensioning by co-ordinate methods-The rules for dimensioning standard, features “Circles (holes) arcs, angles, tapers, chamfers, and dimension of narrow spaces.

5.0 Geometric Construction

Division of a line: to divide a straight line into given number of equal parts internally examples in engineering application.
Construction of tangent lines: to draw tangent lines touching circles internally and externally.
Construction of tangent arcs

i) To draw tangent arc of given radius to touch two lines inclined at given angle (acute, right and obtuse angles).

ii)Tangent arc of given radius touching a circle or an arc and a given line.

iii)Tangent arcs of radius R, touching two given circles internally and externally.

Construction of polygon:construction of any regular polygon of given side length using general method
Conical Curves: Explanation of Ellipse, Parabola, Hyperbola, as sections of a double cone and a loci of a moving point, Eccentricity of above curves – Their Engg. application viz. Projectiles, reflectors, P-V Diagram of a Hyperbolic process,
Construction of any conic section of given eccentricity by general method
Construction of ellipse by concentric circles method
Construction of parabola by rectangle method
Construction of rectangular hyperbola
General Curves: Involute, Cycloid and Helix, explanations as locus of a moving point, their engineering application, viz, Gear tooth profile, screw threads, springs etc. - their construction

6.0 Projection of points, lines and planes & solids

Projecting a point on two planes of projection -Projecting a point on three planes of projection -Projection of straight line.
(a) Parallel to both the planes.
(b) Perpendicular to one of the planes.
(c) inclined to one plane and parallel to other planes
Projection of regular planes
(a) Plane perpendicular to HP and parallel to VP and vice versa.
(c) Plane perpendicular to HP and inclined to VP and vice versa.

Projection of regular solids
(a) Axis perpendicular to one of the planes
(b) Axis parallel to VP and inclined to HP and vice versa.

7.0 Auxiliary views

Need for drawing auxiliary views -Explanation of the basic principles of drawing an auxiliary views explanation of reference plane and auxiliary plane - Partial auxiliary view.

8.0 Sectional views

Need for drawing sectional views – what is a sectional view - Location of cutting plane – Purpose of cutting plane line – Selection of cutting plane to give maximum information (vertical and offset planes) - Hatching – Section of regular solids inclined to one plane and parallel to other plane

9.0 Orthographic Projections

Meaning of orthographic projection -Using a viewing box and a model – Number of views obtained on the six faces of the box, - Legible sketches of only 3 views for describing object -Concept of front view, top view, and side view sketching these views for a number of engg objects - Explanation of first angle projection. – Positioning of three views in First angle projection - Projection of points as a means of locating the corners of the surfaces of an object – Use of miter line in drawing a third view when other two views are given -Method of representing hidden lines -Selection of minimum number of views to describe an object fully.

10.0 Pictorial Drawings

Brief description of different types of pictorial drawing viz., Isometric, oblique, and perspective and their use - Isometric drawings: Iso axis, angle between them, meaning of visual distortion in dimensions - Need for an isometric scale, difference between Isometric scale, and ordinary scale difference between Isometric view and Isometric projection - Isometric and non-Isometric lines -Isometric drawing of common features like rectangles, circular - shapes, non-isometric lines - Use of box and offset methods

11.0 Development of Surfaces

Need for preparing development of surface with reference to sheet metal work -Concept of true length of a line with reference to its orthographic projection when the line is (i) parallel to the plane of projection (ii) inclined to one principal and parallel to the other -Development of simple solids like cubes, prisms, cylinders, cones, pyramid (sketches only) -Types of development: Parallel line and radial line development -Procedure of drawing development, drawings of trays, funnels, 90^0 elbow pipes and rectangular ducts.

REFERENCE BOOKS

Engineering Graphics by P I Varghese – (McGraw-hill)
Engineering Drawing by Basant Agarwal & C.M Agarwal - (McGraw-hill)
Engineering Drawing by N.D.Bhatt.
T.S.M. & S.S.M on " Technical Drawing" prepared by T.T.T.I., Madras.
SP-46-1998 – Bureau of Indian Standards.

C PROGRAMMING LAB PRACTICE

Subject Title : C Programming Lab Practice
Subject Code : CM - 108
Periods per Week : 6
Periods per Year : 180

LIST OF EXPERIMENTS

1. Exercise on structure of C program
2. Exercise on Keywords and identifiers
3. Exercise on constants and variables
4. Execution of simple C program
5. Exercise on operators and expressions
6. Exercise on special operators
7. Exercise on input and output of characters
8. Exercise on formatted input and output
9. Exercise on simple if statement
10. Exercise on if..else statement
11. Exercise on else..if ladder statement
12. Exercise on switch statement
13. Exercise on conditional operator
14. Exercise on while statement
15. Exercise on for statement
16. Exercise on do statement
17. Exercise on one dimensional arrays
18. Exercise on two dimensional arrays
19. Exercise on strings
20. Exercise on user-defined function
21. Exercise on recursion
22. Exercise on structure
23. Exercise on array of structures
24. Exercise on pointers
25. Exercise on text files

The competencies and key competencies to be achieved by the student

S.No.	Name of the experiment	Objectives	Key Competencies
1	Exercise on structure of C program	For a given C program, identify the different building blocks	❖ Identify different building block in a C program
2	Exercise on Keywords and identifiers	For a given C program identify the keywords and identifiers	❖ Identify different keywords ❖ Check whether the keywords are in lowercase ❖ Differentiate identifiers and keywords
3	Exercise on constants and variables	For a given C program identify the constants and variables	❖ Identify the constants ❖ Identify the variables ❖ Declare variables with proper names ❖ Know the assignment of values to variables
4	Execution of simple C program	Execute a simple C program	❖ Acquaint with C program editing ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program
5	Exercise on operators and expressions	Write a C program that uses different arithmetic operators	❖ Identify different arithmetic operators ❖ Build arithmetic expressions ❖ Identify the priorities of operators ❖ Evaluate arithmetic expression ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check the output for its correctness
6	Exercise on special operators	Write a C program that uses special operators	❖ Identify different special operators ❖ Build expressions using special operators ❖ Compile the program ❖ Rectify the syntactical errors ❖ Execute the program ❖ Check the output for its correctness
7	Exercise on input and output of characters	Write a C program for reading and writing characters	❖ Know the use of getchar() function ❖ Know the use of putchar() function ❖ Compile the program ❖ Rectify the syntactical errors

			❖ Execute the program ❖ Check whether the correct output is printed for the given input
8	Exercise on formatted input and output	Write a C program using formatted input and formatted output	❖ Know the use of format string for different types of data in scanf() function ❖ Know the use of format string for different types of data in printf() function ❖ Check whether the data is read in correct format ❖ Check whether the data is printed in correct format
9	Exercise on simple if statement	Write a C program using simple if statement	❖ Build a relational expression ❖ Use the if statement for decision making ❖ Rectify the syntax errors ❖ Check the output for correctness
10	Exercise on if..else statement	Write a C program using if..else statement	❖ Build a relational expression ❖ Use the if..else statement for decision making ❖ Rectify the syntax errors ❖ Check the output for correctness
11	Exercise on else..if ladder statement	Write a C program using else..if ladder statement	❖ Use else..if ladder statements with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check the output for correctness
12	Exercise on switch statement	Write a C program using switch statement	❖ Use switch statement with correct syntax ❖ Identify the differences between switch and else..if ladder ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check the output for correctness
13	Exercise on conditional operator	Write a C program using (**?** **:**) conditional operator	❖ Build the three expressions for conditional operator ❖ Use conditional operator with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Differentiate conditional operator and if..else statement
14	Exercise on while statement	Write a C program using while statement	❖ Build the termination condition for looping

			❖ Use while statement with correct syntax ❖ Check whether correct number of iterations are performed by the while loop ❖ Rectify the syntax errors ❖ Debug logical errors
15	Exercise on for statement	Write a C program using for statement	❖ Build the initial, increment and termination conditions for looping ❖ Use for statement with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check whether correct number of iterations are performed by the while loop ❖ Differentiate for and while statements
16	Exercise on do statement	Write a C program using do statement	❖ Build the termination condition for looping ❖ Use do statement with correct syntax ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check whether correct number of iterations are performed by the while loop ❖ Differentiate do, while and for statements
17	Exercise on one dimensional arrays	Write a C program to create and access one dimensional array	❖ Create a one dimensional array with correct syntax ❖ Store elements into array ❖ Read elements from array ❖ Validate boundary conditions while accessing elements of array ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
18	Exercise on two dimensional arrays	Write a C program to create and access two dimensional array	❖ Create a two dimensional array with correct syntax ❖ Store elements into array ❖ Read elements from array ❖ Validate boundary conditions while accessing elements of array ❖ Rectify the syntax errors ❖ Debug logical errors

			❖ Check for the correctness of output for the given input
19	Exercise on strings	Write a C program for reading and writing strings	❖ Declare and initialize string variables ❖ Read strings from keyboard ❖ Print strings to screen
20	Exercise on user-defined function	Write a C program to define and call user-defined functions	❖ Identify the different parts of function declaration ❖ Define function with correct syntax ❖ Classify functions based on it parameters and return types ❖ Identify parameters passed ❖ Identify parameter passing method used ❖ Identify return value ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
21	Exercise on recursion	Write a C program using recursion	❖ Identify where recursive call is made in the function ❖ Validate the termination condition ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
22	Exercise on structure	Write a C program using structure	❖ Define a structure with correct syntax ❖ Identify different members of a structure ❖ Declare a structure variable ❖ Access different members of structure ❖ Observe the size of the structure ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
23	Exercise on array of structures	Write a C program to create an array of structures and store and retrieve data from that array	❖ Define a structure with correct syntax ❖ Identify different members of a structure ❖ Declare a structure variable ❖ Create an array of structure ❖ Access individual element of the array of structure ❖ Access different members of

			structure ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
24	Exercise on pointers	Write a C program using pointer data type	❖ Declare pointer variable ❖ Initialize pointer variable ❖ Access a variable through its pointer ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input
25	Exercise on text files	Write a C program to create a text file, write data into it and read data from it	❖ Define a file pointer ❖ Use the various modes of file opening ❖ Close the file ❖ Write text into file ❖ Read text from file ❖ Rectify the syntax errors ❖ Debug logical errors ❖ Check for the correctness of output for the given input

ENGINEERING PHYSICS LAB PRACTICE
(Common to all Branches)

Subject Title : Engineering Physics Lab Practice
Subject Code : CM-109 A
Periods per week : 03
Total periods per year : 45

TIME SCHEDULE

S.No	Name of the Experiment	No. of Periods
1.	Hands on practice on Vernier Calipers	03
2.	Hands on practice on Screw gauge	03
3.	Verification of Parallelogram law of forces and Triangle law of forces	03
4.	Simple pendulum	03
5.	Velocity of sound in air – (Resonance method)	03
6.	Focal length and Focal power of convex lens (Separate & Combination)	03
7.	Refractive index of solid using traveling microscope	03
8.	Surface tension of liquid using traveling microscope	03
9.	Coefficient of viscosity by capillary method	03
10.	Boyle's law verification	03
11.	Meter bridge	03
12.	Mapping of magnet lines of force	03
	Revision	06
	Test	03
	Total:	**45**

Objectives:

Upon completion of the course the student shall be able to

1.0 Practice the Vernier caliper to determine the volume of a cylinder and sphere
2.0 Practice the Screw gauge to determine thickness of a glass plate and cross section of a wire
3.0 Verify the parallelogram law and Triangle law
4.0 Determine the value of acceleration due to gravity using Simple Pendulum
5.0 Determine the velocity of sound in air at room temperature
6.0 Determine the Focal length and focal power of convex lenses using U-V method
7.0 Determine the refractive index of a solid using travelling microscope
8.0 Determine the surface tension of a liquid using travelling microscope
9.0 Determine the viscosity of a liquid using capillary method
10.0 Verify the Boyle's law employing a Quill tube
11.0 Determine the specific resistance of wire material using Meter Bridge
12.0 Practice the mapping of magnetic lines of force

Competencies and Key competencies to be achieved by the student

Name of the Experiment	Competencies	Key competencies
1. Hands on practice on Vernier Calipers	• Find the Least count • Fix the specimen in posit • Read the scales • Calculate the volume of given object	• Read the scales • Calculate the volume of given object
2. Hands on practice on Screw gauge	• Find the Least count • Fix the specimen in posit • Read the scales • Calculate thickness of glass place and cross section of wire	• Read the scales • Calculate thickness of given glass plate • Calculate cross section of wire
3. Verification of Parallelogram law of forces and Triangle law of forces	• Fix suitable weights • Note the positions of threads on drawing sheet • Find the angle at equilibrium point • Construct parallelogram • Compare the measured diagonal • Construct triangle	• Find the angle at equilibrium point • Constructing parallelogram • Construct triangle • Compare the ratios of force and length
4. Simple pendulum	• Fix the simple pendulum to the stand • Adjust the length of pendulum • Find the time for number of oscillations • Find the time period • Calculate the acceleration due to gravity • Draw l-T and l-T^2 graph	• Find the time for number of oscillations • Find the time period • Calculate the acceleration due to gravity • Draw l-T and l-T^2 graph
5. Velocity of sound in air –Resonance method	• Arrange the resonance apparatus • Adjust the reservoir level for booming sound • Find the first and second resonanting lengths • Calculate velocity of	• Adjust the reservoir level • Find the first and second resonanting lengths • Calculate velocity of sound • Calculate velocity of

Name of the Experiment	Competencies	Key competencies
6. Focal length and Focal power of convex lens (Separate & Combination)	• Fix the object distance • Find the Image distance • Calculate the focal length and power of convex lens and combination of convex lenses	• Calculate the focal length and power of convex lens • Draw u-v and 1/u – 1/v graph
7. Refractive index of solid using traveling microscope	• Find the least count of vernier on microscope • Place the graph paper below microscope • Read the scale • Calculate the refractive index of glass slab	• Read the scale • Calculate the refractive index of glass slab
8. Surface tension of liquid using traveling microscope	• Find the least count of vernier on microscope • Focus the microscope to the lower meniscus & bent pin • Read the scale • Calculate height of liquid rise • Calculate the surface tension of water	• Read the scale • Calculate height of liquid rise • Calculate the surface tension of water
9. Coefficient of viscosity by capillary Method	• Find the least count of vernier • Fix the capillary tube to aspiratory bottle • Find the mass of collected water • Find the pressure head • Calculate rate of volume of liquid collected • Find the radius of capillary tube • Calculate the viscosity of water using capillary method	• Find the pressure head • Calculate rate of volume of liquid collected • Find the radius of capillary tube • Calculate the viscosity of water

Name of the Experiment	Competencies	Key competencies
10. Boyle's law verification	• Note the atmospheric pressure • Fix the quill tube to retort stand • Find the length of air column • Find the pressure of enclosed air • Find and compare the calculated value P x l	• Find the length of air column • Find the pressure of enclosed air • Find the value P x l
11. Meter bridge	• Make the circuit connections • Find the balancing length • Calculate unknown resistance • Find the radius of wire • Calculate the specific	• Find the balancing length • Calculate unknown resistance • Calculate the specific resistance
12. Mapping of magnet lines of Force	• Draw magnetic meridian • Placed the bar magnet in NN and NS directions • Draw magnetic lines of force • Locate the neutral points along equatorial and axial lines	• Draw magnetic lines of force • Locate the neutral points along equatorial and axial lines

ENGINEERING CHEMISTRY LAB PRACTICE
(Common to all Branches)

Subject Title : Engineering Chemistry Lab Practice
Subject Code : CM -109 B
Periods per week : 03
Total periods per year : 45

TIME SCHEDULE

S.No	Name of the Experiment	No. of Periods
1.	Familiarization of methods for Volumetric analysis	03
2.	Preparation of Std Na_2CO_3 and making different diluted solution.	03
3.	Estimation of HCl solution using Std. Na_2CO_3 solution	03
4.	Estimation of NaOH using Std. HCl solution	03
5.	Estimation of H_2SO_4 using Std. NaOH solution	03
6.	Estimation of Mohr's Salt using Std. $KMnO_4$	03
7.	Determination of acidity of water sample	03
8.	Determination of alkalinity of water sample	03
9.	Determination of total hardness of water using Std. EDTA	03
10.	Estimation of Chlorides present in water sample	03
11.	Estimation of Dissolved Oxygen (D.O) in water sample	03
12.	Determination of pH using pH meter	03
13.	Determination of conductivity of water and adjusting ionic strength to	03
14.	Determination of turbidity of water	03
15.	Estimation of total solids present in water sample	03
	Total:	**45**

Objectives:

Upon completion of the course the student shall be able to

1.0 Practice volumetric measurements (using pipetts, measuring jars, volumetric flask, burettes) and gravimetric measurements (using different types of balances), making dilutions, etc.

2.0 Practice making standard solutions with pre weighted salts and to make desired dilutions using appropriate techniques.

3.0 Conduct titrations adopting standard procedures and using Std. Na_2CO_3 solution for estimation of HCl

4.0 Conduct titrations adopting standard procedures and using Std. HCl solution for estimation of NaOH

5.0 Conduct titrations adopting standard procedures and using Std. NaOH solution for estimation of H_2SO_4

6.0 Conduct titrations adopting standard procedures and using Std. $KMnO_4$ solution for estimation of Mohr's Salt

7.0 Conduct titrations adopting standard procedures to determine the acidity of given samples of water (One ground water and one surface / tap water, and rain water if available)

8.0 Conduct titrations adopting standard procedures to determine the alkalinity of given samples of water (One ground water and one surface / tap water)

9.0 Conduct titrations adopting standard procedures to determine the total hardness of given samples of water (One ground water and one surface / tap water) using Std. EDTA solution

10.0 Conduct titrations adopting standard procedures to determine the chlorides present in the given samples of water and wastewater (One ground water and one surface / tap water)

11.0 Conduct the test using titrometric / electrometric method to determine Dissolved Oxygen (D.O) in given water samples (One sample from closed container and one from open container / tap water)

12.0 Conduct the test on given samples of water / solutions (like soft drinks, sewage, etc.) to determine their pH using standard pH meter

13.0 Conduct the test on given samples of water / solutions

a) To determine conductivity

b) To adjust the ionic strength of the sample to the desired value

14.0 Conduct the test on given samples of solutions (coloured and non coloured) to determine their turbidity in NTU

15.0 Conduct titrations adopting standard procedures to determine the total solids present in given samples of water (One ground water and one surface / tap water)

Competencies and Key competencies to be achieved by the student

Name of the Experiment	Competencies	Key competencies
Familiarization of methods for Volumetric analysis	--	--
Preparation of Std Na_2CO_3 and making different diluted solution	▪ Weighting the salt to the accuracy of .01 mg ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate dilutions	▪ Weighting the salt to the accuracy of .01 mg ▪ Measuring the water with volumetric flask, measuring jar, volumetric pipette and graduated pipette ▪ Making appropriate dilutions

Name of the Experiment	Competencies	Key competencies
Estimation of HCl solution using Std. Na_2CO_3 solution	▪ Cleaning the glassware and rinsing with appropriate solutions ▪ Making standard solutions ▪ Measuring accurately the standard solutions and titrants ▪ Filling the burette with titrant ▪ Fixing the burette to the stand ▪ Effectively Controlling the flow of the titrant ▪ Identifying the end point ▪ Making accurate observations ▪ Calculating the results	▪ Making standard solutions ▪ Measuring accurately the standard solutions and titrants ▪ Effectively Controlling the flow of the titrant ▪ Identifying the end point ▪ Making accurate observations
Estimation of NaOH using Std. HCl solution		
Estimation of H_2SO_4 using Std. NaOH solution		
Estimation of Mohr's Salt using Std. $KMnO_4$		
Determination of acidity of water sample		
Determination of alkalinity of water sample		
Determination of total hardness of water using Std. EDTA solution		
Estimation of Chlorides present in water sample		
Estimation of Dissolved Oxygen (D.O) in water sample (By titration method)		
Estimation of Dissolved Oxygen (D.O) in water sample (By electrometric method)	▪ Familiarize with instrument ▪ Choose appropriate 'Mode' / 'Unit' ▪ Prepare standard solutions / buffers, etc. ▪ Standardize the instrument with appropriate standard solutions ▪ Plot the standard curve ▪ Make measurements accurately ▪ Follow Safety precautions	▪ Prepare standard solutions / buffers, etc. ▪ Standardize the instrument with appropriate standard solutions ▪ Plot the standard curve ▪ Make measurements accurately
Determination of pH using pH meter		
Determination of conductivity of water and adjusting ionic strength to required level		
Determination of turbidity of water		

Name of the Experiment	Competencies	Key competencies
Estimation of total solids present in water sample	▪ Measuring the accurate volume and weight of sample ▪ Filtering and air drying without losing any filtrate ▪ Accurately weighing the filter paper, crucible and filtrate ▪ Drying the crucible in an oven	▪ Measuring the accurate volume and weight of sample ▪ Filtering and air drying without losing any filtrate ▪ Accurately weighing the filter paper, crucible and filtrate

COMPUTER FUNDEMENTALS LAB PRACTICE
(Common to all Branches)

Subject Title : Computer Fundamentals Laboratory Practice
Subject Code : CM-110
Periods/Week : 03
Periods/Year : 90

List of Experiments:

S. No.	Major Topics	No. of sessions each of 3 periods duration	No. of Periods
I.	Computer hardware Basics	01	03
II.	Windows Operating System	02	06
III.	MS Word	09	27
IV.	MS Excel	09	27
V.	MS PowerPoint	09	27
	Total	30	90

Rationale: The knowledge of Computer usage has become a must for everyone, due to widespread computer usage and related applications in all fields. This laboratory is designed to give the students hands on practice of Windows Operating System and MS Office to enable the students to use these skills in future courses.

I. Computer Hardware Basics (Not for end examination)

1. a).To Familiarize with Computer system and hardware connections
   b).To start and Shut down Computer correctly
   c). To check the software details of the computer
2. To check the hardware present in your computer

II. Windows's operating system (Not for end examination)

3. To Explore Windows Desktop
4. Working with Files and Folders
5. Windows Accessories: Calculator – Notepad – WordPad – MS Paint

III. Practice with MS-WORD

6. To familiarize with Ribbon layout of MS Word
   Home - Insert - Page layout – References – Review - View
7. To practice Word Processing Basics

8. To practice Formatting techniques
9. To insert a table of required number of rows and columns
10. To insert Objects, Clipart and Hyperlinks
11. To use Mail Merge feature of MS Word
12. To use Equations and symbols features

IV. Practice with MS-EXCEL

13. To familiarize with MS-EXCEL layout
14. To access and Enter data in the cells
15. To edit a spread sheet- Copy, Cut, Paste, and selecting Cells
16. To use built in functions and Formatting Data
17. To create Excel Functions, Filling Cells
18. To enter a Formula for automatic calculations
19. To practice Excel Graphs and Charts
20. To format a Worksheet in Excel, Page Setup and Print

V. Practice with MS-POWERPOINT

21. To familiarize with Ribbon layout features of PowerPoint 2007.
22. To create a simple PowerPoint Presentation
23. To set up a Master Slide in PowerPoint
24. To insert Text and Objects
25. To insert a Flow Charts
26. To insert a Table
27. To insert a Charts/Graphs
28. To insert video and audio
29. To practice Animating text and objects
30. To Review presentation

Competencies and Key Competencies to be achieved by the students

Exp No.	Name of the Experiment	Competencies	Key Competencies
1 (a).	To familiarize with Computer system and hardware connections	a. Identify the Parts of a Computer system a). CPU b) Monitor c) CD/DVD Drive d) Power Switch e) Start Button f) Reset Button b. Identify and connect various peripherals c. Identify and connect the cables used with computer system d. Identify various ports on CPU and connect Keyboard & Mouse	Connect cables to external hardware and operate the computer
1 (b).	To Start and Shut down Computer correctly	a. Log in using the password b. Start and shut down the computer c. Use Mouse and Key Board	a. Login and logout as per the standard procedure b. Operate mouse &Key Board
1 (c).	To Explore Windows Desktop	a. Familiarize with Start Menu, Taskbar, Icons and Shortcuts b. Access application programs using Start menu, Task manager c. Use Help support	a. Access application programs using Start menu b. Use taskbar and Task manager
2.	To check the software details of the computer	a. Find the details of Operating System being used b. Find the details of Service Pack installed	Access the properties of computer and find the details
3.	To check the hardware present in your computer	a. Find the CPU name and clock speed b. Find the details of RAM and Hard disk present c. Access Device manager using Control Panel and check the status of devices like mouse and key board d. Use My Computer to check the details of Hard drives and partitions e. Use the Taskbar	a. Access device manager and find the details b. Type /Navigate the correct path and Select icon related to the details required
4.	Working with Files and Folders	a. Create folders and organizing files in different folders b. Use copy / paste move commands to organize files and folders	a. Create files and folders Rename , arrange and search for the required folder/file

Exp No.	Name of the Experiment	Competencies	Key Competencies
	Working with Files and Folders Continued....	c. Arrange icons – name wise, size, type, Modified d. Search a file or folder and find its path e. Create shortcut to files and folders (in other folders) on Desktop f. Familiarize with the use of My Documents g. Familiarize with the use of Recycle Bin	b. Restore deleted files from Recycle bin
5.	To use Windows Accessories: Calculator – Notepad – WordPad – MS Paint	a. Familiarize with the use of Calculator b. Access Calculator using Run command c. Create Text Files using Notepad and WordPad and observe the difference in file size d. Use MS paint and create .jpeg, .bmp files using MS Paint	a. Use windows accessories and select correct text editor based on the situation. b. Use MS pain to create /Edit pictures and save in the required format.
6.	To familiarize with Ribbon layout of MS word. – Home – Insert- page layout- References-Review-View	a. Create/Open a document b. Use Save and Save as features c. Work on two documents simultaneously d. Choose correct Paper size and Printing options	a. Create a Document and name appropriately and save b. Set paper size and print options
7.	To practice Word Processing Basics	a. Typing text b. Keyboard usage c. Use mouse (Left click / Right click / Scroll) d. Use Keyboard shortcuts e. Use Find and Replace features in MS- word f. Use Undo and Redo Features g. Use spell check to correct Spellings and Grammar	a. Use key board and mouse to enter/edit text in the document. b. Use shortcuts c. Use spell check/ Grammar features for auto corrections.
8.	To practice Formatting techniques	a. Formatting Text b. Formatting Paragraphs c. Setting Tabs d. Formatting Pages e. The Styles of Word f. Insert bullets and numbers g. Themes and Templates h. Insert page numbers, header and footer	a. Format Text and paragraphs and use various text styles. b. Use bullets and numbers to create lists c. Use Templates /Themes d. Insert page numbers date, headers and footers

Exp No.	Name of the Experiment	Competencies	Key Competencies
9.	To insert a table of required number of rows and columns	a. Edit the table by adding the fields – Deleting rows and columns –inserting sub table – marking borders. Merging and splitting of cells in a Table b. Changing the background colour of the table c. Use table design tools d. Use auto fit – fixed row/ column height/length – Even distribution of rows / columns features e. Convert Text to table and Table to Text f. Use Sort feature of the Table to arrange data in ascending/descending order	a. Insert table in the word document and edit b. Use sort option for arranging data.
10.	To Insert objects, clipart and Hyperlinks	a. Create a 2-page document. &Insert hyperlinks and t Bookmarks. b. Create an organization chart c. Practice examples like preparing an Examination schedule notice with a hyperlink to Exam schedule table.	a. Insert hyperlinks &Bookmarks b. Create organization charts/flow charts
11.	To Use Mail merge feature of MS Word	a. Use mail merge to prepare individually addressed letters b. Use mail merge to print envelopes.	Use Mail merge feature
12.	To use Equations and symbols features.	a. Explore various symbols available in MS Word b. Insert a symbol in the text c. Insert mathematical equations in the document	Enter Mathematical symbols and Equations in the word document
13.	To Practice with MS-EXCEL	a. Open /create an MS Excel spreadsheet and familiarize with MS Excel 2007 layout like MS office Button- b. Use Quick Access Toolbar- Title Bar- Ribbon-Worksheets-Formula Bar-Status Bar	a. Familiarize with excel layout and use b. Use various features available in toolbar
14.	To access and Enter data in the cells	a. Move Around a Worksheets-Quick access -Select Cells b. Enter Data-Edit a Cell-Wrap Text-Delete a Cell Entry-Save a File-Close Excel	a. Access and select the required cells by various addressing methods b. Enter data and edit

Exp No.	Name of the Experiment	Competencies	Key Competencies
15.	To edit spread sheet Copy, Cut, Paste, and selecting cells	a. Insert and Delete Columns and Rows-Create Borders-Merge and Center b. Add Background Color-Change the Font, Font Size, and Font Color c. Format text with Bold, Italicize, and Underline-Work with Long Text-Change a Column's Width	Format the excel sheet
16.	To use built in functions and Formatting Data	a. Sort and filter data in a worksheet b. Perform Mathematical Calculations verify -AutoSum c. Perform Automatic Calculations-Align Cell Entries	Use built in functions in Excel
17.	To enter a Formula for automatic calculations	a. Enter formula b. Use Cell References in Formulae c. Use Automatic updating function of Excel Formulae d. Use Mathematical Operators in Formulae e. Use Excel Error Message and Help	Enter formula for automatic calculations
18.	To Create Excel Functions, Filling Cells	a. Use Reference Operators b. Work with sum, Sum if , Count and Count If Functions c. Fill Cells Automatically	a. Create Excel sheets involving cross references and equations b. Use the advanced functions for conditional calculations
19.	To Practice Excel Graphs and Charts	a. Produce an Excel Pie Chart b. Produce c. Excel Column Chart	a. Use data in Excel sheet to Create technical charts and graphs Produce Excel Line Graph b. Produce a Pictograph in Excel
20.	To format a Worksheet in Excel, page setup and print	a. Shade alternate rows of data b. Add currency and percent symbols c. Change height of a row and width of a column d. Change data alignment e. Insert Headers and Footers f. Set Print Options and Print	a. Format Excel sheet b. Insert headers &footers and print
21.	To familiarize with Ribbon layout &features of PowerPoint 2007.	Use various options in Home, insert , design, animation , slideshow, Review &View in the PowerPoint	Access required options in the tool bar

Exp No.	Name of the Experiment	Competencies	Key Competencies
22.	To create a simple PowerPoint Presentation	a. Insert a New Slide into PowerPoint b. Change the Title of a PowerPoint Slide c. PowerPoint Bullets d. Add an Image to a PowerPoint Slide e. Add a Textbox to a PowerPoint slide	a. Create simple PowerPoint presentation with photographs/ClipArt and text boxes b. Use bullets option
23.	To Set up a Master Slide in PowerPoint and add notes	a. Create a PowerPoint Design Template b. Modify themes c. Switch between Slide master view and Normal view d. Format a Design Template Master Slide e. Add a Title Slide to a Design Template f. The Slide Show Footer in PowerPoint f. Add Notes to a PowerPoint Presentation	a. Setup Masterslide and format b. Add notes
24.	To Insert Text and Objects	a. Insert Text and objects b. Set Indents and line spacing c. Insert pictures/ clipart d. Format pictures e. Insert shapes and word art f. Use 3d features g. Arrange objects	Inset Text and Objects Use 3d features
25.	To insert a Flow Chart / Organizational Charts	a. Create a Flow Chart in PowerPoint b. Group and Ungroup Shapes c. Use smart art	Create organizational charts and flow charts using smart art
26.	To insert a Table	a. PowerPoint Tables b. Format the Table Data c. Change Table Background d. Format Series Legend	Insert tables and format
27.	To insert a Charts/Graphs	a. Create 3D Bar Graphs in PowerPoint b. Work with the PowerPoint Datasheet c. Format a PowerPoint Chart Axis d. Format the Bars of a Chart e. Create PowerPoint Pie Charts f. Use Pie Chart Segments g. Create 2D Bar Charts in PowerPoint h. Format the 2D Chart e. Format a Chart Background	Create charts and Bar graphs, Pie Charts and format.

Exp No.	Name of the Experiment	Competencies	Key Competencies
28.	To Insert audio &video, Hyper links in a slide Add narration to the slide	a. Insert sounds in the slide and hide the audio symbol b. Adjust the volume in the settings c. Insert video file in the format supported by PowerPoint in a slide d. Use automatic and on click options e. Add narration to the slide f. Insert Hyperlinks	a. Insert Sounds and Video in appropriate format. b. Add narration to the slide c. Use hyperlinks to switch to different slides and files
29.	To Practice Animation effects	a. Apply transitions to slides b. To explore and practice special animation effects like *Entrance, Emphasis, Motion Paths &Exit*	Add animation effects
30.	Reviewing presentation	a. Checking spelling and grammar b. Previewing presentation c. Set up slide show d. Set up resolution e. Exercise with Rehearse Timings feature in PowerPoint f. Use PowerPoint Pen Tool during slide show g. Saving h. Printing presentation (a) Slides (b) Handout	a. Use Spell check and Grammar feature b. Setup slide show c. Add timing to the slides d. Setup automatic slide show

III SEMESTER

ENGINEERING MATHEMATICS – II

(Common to all Branches)

Subject Title : Engineering Mathematics-II
Subject Code : CM-301
Periods per week : 04
Periods per Semester : 60

Blue print

S. No	Major Topic	No of Periods	Weightage of Marks	Short Type			Essay Type		
	Unit - I			R	U	App	R	U	App
1	**Indefinite Integration**	18	34	2	1	0	1	1	1/2
	Unit - II								
2	**Definite Integration and its applications**	17	31	0	1	1	0	1	1 1/2
	Unit - III								
3	**Differential Equations of first order**	15	29	2	1	0	1/2	1/2	1
	Unit - IV								
4	**Statistical Methods**	10	16	1	1	0	1	0	0
	Total	60	110	5	4	1	2 1/2	2 1/2	3
			Marks:	15	12	3	25	25	30

R: Remembering type 40 marks

U: Understading type 37 marks

App: Application type 33 marks

Objectives

Upon completion of the subject the student shall be able to :

Unit-I

1.0 Use Indefinite Integration to solve engineering problems

1.1 Explain the concept of Indefinite integral as an anti-derivative.

1.2 State the indefinite integral of standard functions and properties of Integrals $\int$ (u + v) *dx* and $\int ku\,dx$ where *k* is constant and *u, v* are functions of *x.*

1.3 Solve integration problems involving standard functions using the above rules.

1.4 Evaluate integrals involving simple functions of the following type by the method of substitution.

i) $\int f(ax + b)\,dx$ *where* $f(x)\,dx$ is in standard form.

ii) $\int [f(x)]^n f'(x)\,dx$

iii) $\int f'(x)/[f(x)]\,dx$

iv) $\int f\{g(x)\}\,g'(x)\,dx$

1.5 Find the Integrals of *tan x, cot x, sec x* and *cosec x* using the above.

1.6 Evaluate the integrals of the form $\int Sin^m\theta\ Cos^n\theta.\,d\theta$ where m and n are positive integers.

1.7 Evaluate integrals of powers of *tan x* and *sec x*.

1.8 Evaluate the Standard Integrals of the functions of the type

$$i)\ \frac{1}{a^2+x^2}, \frac{1}{a^2-x^2}, \frac{1}{x^2-a^2}$$

$$ii)\ \frac{1}{\sqrt{a^2+x^2}}, \frac{1}{\sqrt{a^2-x^2}}, \frac{1}{\sqrt{x^2-a^2}}$$

$$iii)\ \sqrt{x^2-a^2}, \sqrt{x^2+a^2}, \sqrt{a^2-x^2}$$

1.9 Evaluate the integrals of the type

$$\int \frac{1}{a \pm bSin\theta} d\theta, \int \frac{1}{a \pm b\cos\theta} d\theta \text{ and } \int \frac{1}{a\cos\theta \pm b\sin\theta \pm c} d\theta .$$

1.10 Evaluate integrals using decomposition method.

1.11 Evaluate integrals using integration by parts with examples.

1.12 State the Bernoulli's rule for evaluating the integrals of the form $\int u.v dx$.

1.13 Evaluate the integrals of the form $\int e^x [f(x) + f'(x)] dx$.

Unit-II

2.0 Understand definite integral and use it in engineering applications

2.1 State the fundamental theorem of integral calculus

2.2 Explain the concept of definite integral.

2.3 Calculate the definite integral over an interval.

2.4 State various properties of definite integrals.

2.5 Evaluate simple problems on definite integrals using the above properties.

2.6 Explain definite integral as a limit of sum by considering an area.

2.7 Find the areas under plane curves and area enclosed between two curves using integration.

2.8 Obtain the volumes of solids of revolution.

2.9 Obtain the mean value and root mean square value of the functions in any given interval.

2.10 Explain the Trapezoidal rule, Simpson's 1/3 rules for approximation of integrals and provide some examples.

Unit -III

3.0 Solve Differential Equations in engineering problems.

3.1 Define a Differential equation, its order, degree

3.2 Form a differential equation by eliminating arbitrary constants.

3.3 Solve the first order first degree differential equations by the following methods:

i. Variables Separable.

ii. Homogeneous Equations.

iii. Exact Differential Equations

iv. Linear differential equation of the form $dy/dx + Py = Q$,

where P and Q are functions of x or constants.

iv. Bernoulli's Equation (Reducible to linear form.)

3.4 Solve simple problems leading to engineering applications

Unit -IV

4.0 Use Statistical Methods as a tool in data analysis.

4.1 Recall the measures of central tendency.

4.2 Explain the significance of measures of dispersion to determine the degree of heterogeneity of the data.

4.3 Find the measures of dispersion – range, quartile deviation, mean deviation, standard deviation for the given data.

4.4 Explain the merits and demerits of the above measures of dispersion.

4.5 Express relationship between measures of dispersion

4.6 Find the coefficient of variation

4.7 Explain bivariate data.

4.8 Explain the concept of correlation between two variables and co-varience.

4.9 Explain coefficient of correlation and its properties

4.10 Calculate the coefficient of correlation between two variables.

4.11 Find rank correlation co-efficient.

COURSE CONTENTS

Unit-I

Indefinite Integration:

1**.** Integration regarded as anti-derivative – Indefinite integral of standard functions. Properties of indefinite integral. Integration by substitution or change of variable. Integrals of the form $\sin^m\theta.\ \cos^n\theta.$ where m and n are positive integers. Integrals of tan x, cot x, sec x, cosec x and powers of tan x, sec x by substitution.

Evaluation of integrals which are reducible to the following forms :

$$i)\ \frac{1}{a^2+x^2}, \frac{1}{a^2-x^2}, \frac{1}{x^2-a^2}$$

$$ii)\ \frac{1}{\sqrt{a^2+x^2}}, \frac{1}{\sqrt{a^2-x^2}}, \frac{1}{\sqrt{x^2-a^2}}$$

$$iii)\ \sqrt{x^2-a^2}, \sqrt{x^2+a^2}, \sqrt{a^2-x^2}$$

Integration by decomposition of the integrand into simple rational, algebric functions. Integration by parts , Bernoulli's rule.

Unit-II

Definite Integral and its applications:

2. Definite integral-fundamental theorem of integral calculus, properties of definite integrals, evaluation of simple definite integrals. Definite integral as the limit of a sum. Area under plane curves – Area enclosed between two curves. Volumes of solids of revolution. Mean and RMS values of a function on a given interval. Trapezoidal rule, Simpson's 1/3 rule to evaluate an approximate value of a define integral.

Unit -III

Differential Equations:

3. Definition of a differential equation-order and degree of a differential equation- formation of differential equations-solution of differential equation of first order, first degree: variable-separable, homogeneous, exact, linear differential equation, Bernoulli's equation.

Unit –IV

Statistical Methods:

4. Revise measures of central tendency, measures of dispersion: range, quartile deviation, mean deviation, standard deviation for the given data, merits and demerits, relationship between measures of dispersion, coefficient of variation, bivariate data, concept of correlation, covariance, coefficient of correlation and its properties, rank correlation co-efficient.

Reference Books:

1. Integral Calculus Vol.I, by M.Pillai and Shanti Narayan
2. Thomas' Calculus, Pearson Addison –Wesley Publishers
3. Statistical Methods Vol.I, Das, Tata McGraw-Hill
4. Statistics, 4/e, Schaum's Outline Series (SIE), McGraw-Hill

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Subject Title : Basic Electrical & Electronics Engineering
Subject Code No. : CM – 302
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUE PRINT										
Unit No	**Major Topic**	**No of Periods**		**Weightage of marks**	**Short Type**			**Essay Type**		
		Theory	**Practice**		R	**U**	**App**	R	U	**App**
1	Electric Current-Ohm's law Resistance etc	13	0	26	2	0	0	1	1	0
2	Kirchoff's Laws-Star-DeltaTransformation	2	8	21	1	0	1	½	0	1
3	Electromagnetic Induction	2	8	18	1	0	0	½	1	0
4	Electronic passive components	6	2	13	1	0	0	1	0	0
5	Semiconductor materials , Junction diode & transistors	10	4	24	1	2	0	½	1	0
6	Stabilizers and UPS	05	0	8	1	**0**	**0**	**½**	**0**	**0**
	Total	**38**	**22**	**110**	**7**	**2**	**1**	**4**	**3**	**1**

OBJECTIVES

On completion of the study of the subject the student shall be able to

1.0 Comprehend basic Principles of Electricity

1.1 Distinguish between conductor, insulator and semi-conductor with respect to valence electron.
1.2 Infer Ohm's Law and state it
1.3 Give the concept of Resistance and define the terms specific resistance and conductivity
$R = \rho 1/a$
1.4 Solve simple problems based upon the formulae.
1.5 Explain the effects of temperature on resistance and define temperature co- efficient of resistance.
1.6 Explain the variations of temperature co-efficient of resistance.
1.7 Develop the formula for resistance at any temperature
$Rt = R0(1+\propto ot)$
1.8 Solve simple problems based on the above formulae.
1.9 Explain equivalent resistance of a network, develop the expressions for equivalent resistance with simple series and parallel connections.
1.10 Solve problems on the above.

1.11 Give the idea of division of current in parallel circuits.
1.12 Solve numerical problems on the above.

2.0 Understand Kirchoff's laws and star delta transformations.

2.1 Differentiate between active and passive circuits.
2.2 Explain junction ,branch and loop in circuits.
2.3 State limitations of Ohm's law.
2.4 State Kirchoff's current law and voltage law.
2.5 Solve problems on Kirchoff's laws.
2.6 Explain star and delta circuits
2.7 Explain the concept of circuit transformation and equivalent circuits
2.8 Develop transformation formulae for star- delta transformations
2.9 Solve problems on the above.

3.0 Electro Magnetic Induction

3.1 State Faraday's laws of electro - magnetic induction.
3.2 Explain dynamically and statically induced E.M.F.
3.3 State Lenz's law and explain Fleming's right hand rule.
3.4 Develop the concept of self and mutual inductance.
3.5 State the formulas for self and mutual inductance.
3.6 State co-efficient of coupling.
3.7 Explain the concept of energy stored in a magnetic field.

4.0 Know the different types of Electronic passive components.

4.1 Classify different electronic passive components.
4.2 Define resistance and resistivity of the material
4.3 List the resistors on the basis of materials used for their construction
4.4 State PTC and NTC resistors and their applications.
4.5 Use the color code for the resistors .
4.6 Distinguish between a Potentiometer and Rheostat connection of a variable resistor. Uses of Rheostat and Potentiometer.
4.7 Define the capacitance of a capacitor, its units and permitivity.
4.8 Classify the different capacitors on the basis of dielectric materials
4.9 Mention the Typical capacitance ranges of the above capacitors
4.10 State the color code for tabular ceramic and disk ceramic capacitors
4.11 List the applications of different capacitors
4.12 List applications of AF Choke and RF choke
4.13 List different types of transformers used in electronic Engineering
4.14 State the applications of the above transformers

5.0 Understand the properties of semi-conductor materials and junction diode and Bipolar transistors

5.1 Distinguish between conductor, semi-conductor and insulator on basis of Electrical properties
5.2 Describe the atomic structure of germanium and silicon semi- conductor materials
5.3 Distinguish between intrinsic and Extrinsic semi conductor materials
5.4 Describe the formation of P- type and N-type materials
5.5 Explain with sketches the behavior of P-type and N-type materials
5.6 Explain the formation of PN junction diode
5.7 Describe the operation of PN junction with forward, reverse biases, no bias
5.8 Draw the volt-ampere characteristic of PN junction diode

5.9 Give the forward/reverse resistance of a diode from the characteristic
5.10 State the effect of temperature on the forward and reverse characteristic of silicon and germanium diode
5.11 List the important specifications of a junction diode
5.12 Give the basic constructional features of a transistor
5.13 Explain the principles of transistors
5.14 Sketch the I.S.I symbol for PNP and NPN
5.15 List the configurations of transistors and applications

6.0 Understand the working principle of stabilizers and UPS

6.1 Need for stabilizers
6.2 Types of stabilizers
6.3 Specification and rating of stabilizers
6.4 Working principle of stabilizer with block diagram
6.5 Need for UPS
6.6 Different types of UPS
6.7 Working principle of UPS with block diagram
6.8 Explain each block
6.9 Specification and ratings of UPS
6.10 Maintenance of stabilizers & UPS including batteries
6.11 Spike busters and suppressors
6.12 Explain maintenance free batteries

COURSE CONTENTS

1.Electric Current – Ohm's Law – Resistance:

Conductor, Insulator and semi-Conductor and their atomic patterns, Idea of Electric Potential, Ohm's Law ,Resistance ,Specific resistance ,Conductivity, Problems on the above, Effect of temperature on resistance, Problems on the above, Definition of temperature co-efficient of resistance, Values of temperature co-efficient at different temperature ,Variation of resistivity with temperature, Resistance in series, parallel and series – parallel, combination, Division of current in parallel circuits ,Problems on the above .

2. Kirchoff's Laws – Star – Delta Transformation

Explanation of active and passive circuits, Junction ,branch and loop in circuits,

Limitations of application of Ohm's law, Kirchoff's laws, Current law, Voltage law,

Application to D.C., Networks ,Star-Delta-Transformation,a) Star – Delta configurations

b) Equivalent circuits concept, Concept of transformation, Transformation from Star to Delta, Delta to Star, e)Problems on the above.

3. Electro Magnetic Induction

Faraday's laws of electro – magnetic induction, Dynamically and statically induced E.M.F., Lenz's Law – Fleming's right hand rule, Self and mutual inductance – expression, Co-efficient of coupling, Inductance in series and parallel, Energy stored in a magnetic field – Formula ,Energy stored per unit volume, Lifting power of magnet Problems on the above

4. Components : Types of Resistors – Their ratings – Uses – Types of potentiometers- Their applications- Types of capacitors – Uses – Types of coils – Chokes – Transformers – Switches & relays – Commonly used cables and wires.

5. Semiconductor physics : Electrical properties of semiconductor materials. Semiconductor physics of germanium & silicon atom. Formation and behaviour of P-N junction with no external potentials, with forward and reverse potentials, metal semiconductor diodes, Transistors.

6.Stabilzers And UPS : Need for stabilizers , types of stabilizers ,specification and rating of stabilizers, Working principle of stabilizer with block diagram, need for UPS, Working principle of UPS with Block diagram.

REFERENCE BOOKS

1. Electrical Technology Vol.I -- B.L.Theraja

2. Electrical Technology -- Hughes

3. Electrical Vol.I -- J.B.Gupta

4. Basic Electrical Engineering -- Mittle, TMH

5. Basic Electrical Engineering Vol.1 -- Dhogal, TMH

DIGITAL ELECTRONICS

Subject Title : Digital Electronics
Subject Code : CM – 303
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUE PRINT										
Unit No	**Major Topic**	**No of Periods**		**Weightage of marks**	**Short Type**			**Essay Type**		
		Theory	**Practice**		R	**U**	**App**	R	U	**App**
1	Logic Gates & Boolean Algebra	**15**		**29**		**3**			**2**	
	Gates,Boolean algbra,demorgan theorem	2	5	13	0	0	1	0	0	1
	Kmaps,adders	2	6	16	1	0	1	0	0	1
2	Logic Families and Flip-Flops	**15**		**29**		**3**			**2**	
	Logic families	2	3	3	1	0	0	0	0	0
	Flip flops	5	5	26	1	1	0	0	1	1
3	Counters	**3**	**7**	**18**	**1**	**0**	**0**	**0**	**1½**	**0**
4	Registers and Memories	**15**		**26**		**2**			**2**	
	Registers	5	6	23	0	1	0	0	0	2
	Memories	2	2	3	1	0	0	0	0	0
5	Combinational circuits	**3**	**2**	**8**	**1**	**0**	**0**	**0**	**½**	**0**
	Total	**24**	**36**	**110**	**6**	**2**	**2**	**0**	**5**	**3**

OBJECTIVES

On completion of the study of the subject the student shall be able to

1.0 Comprehend Boolean algebra and working of different logic gates.

1.1 Define AND, OR, NOT operators with truth tables.
1.2 Explain the working of EX-OR and EX-NOR gates with truth tables.
1.3 Explain the working of NAND and NOR gates using truth tables.
1.4 Explain Realization AND, OR, NOT, EX-OR gates using NAND gates only, NOR gates only.
1.5 State the different postulates in Boolean algebra.
1.6 State De-Morgan's theorems.
1.7 Apply De-Morgan's theorems and other postulates of Boolean algebra to simplify the given Boolean expression.

1.8 Write Boolean expression for given truth table.
1.9 Use K – map to simplify Boolean expression (up to 4 variables).
1.10 Comprehend the working of arithmetic circuit.
1.11 Describe the functions of Half Adder.
1.12 Draw Half-Adder circuit using an exclusive OR and an AND gate.
1.13 Explain the process of two Half-Adder and an OR gate constitute a Full-Adder.
1.14 Explain the realization of Half–Adder using only NAND gates or only NOR gates.
1.15 Draw a 4-bit parallel adder using full adders.
1.16 Explain the working of the above circuit.
1.17 Draw a 4-bit parallel adder/ 2's complement subtractor circuit.
1.18 Explain the working of the above circuit.
1.19 Explain the working of a serial adder with a block diagram.
1.20 List any five advantages and disadvantages of a serial adder over parallel adder.
1.21 Explain the operation of a digital comparator circuit for two 4 bit words.

2.0 Comprehend Logic Families and Flip Flops

2.1 Know the details of different logic families**.**
2.2 Define positive and negative logic levels.
2.3 State the basic principle of operation of a Flip-flop.
2.4 Explain the working of a NAND/NOR gate latch.
2.5 Explain with block diagram, waveforms and truth tables the working of RS, RST, T, D and JK Flip-flop.
2.6 Explain the concept of edge and level triggering flip-flops.
2.7 Distinguish between synchronous and asynchronous inputs of a flip- flop and state their functions.
2.8 State the need for a Master-Slave flip-flop.
2.9 Explain the working of a Master-Slave flip-flop using suitable diagram and truth table.

3.0 Comprehend the function of counters and their working.

3.1 Distinguish between asynchronous and synchronous counters.
3.2 Draw and explain module-8 ripple counter and decade counter.
3.3 Explain the counting sequence with waveforms and truth tables in the above circuit.
3.4 Explain the draw backs of ripple counters.
3.5 Draw and explain a 4-bit synchronous counter operation
3.6 Explain the operation of a up/down counter using flip flops.
3.7 State the need for a programmable counter using flip flops.
3.8 Explain the operation of a programmable counter using flip flops.
3.9 Draw and explain the operation of a 4-bit ring counter.
3.10 List any five applications of counter.

4.0 Comprehend the function Registers and their working and memories

4.1 State the need for a Register

4.2 Draw and explain the working of 4 bit shift left and shift right registers

4.3 Explain the transfer of data between register.

4.4 Explain the working of serial in – serial , serial in – parallel out register.and parallel in – parallel out,parallel in-serial out Registers

4.5 Explain the working of Universal shift register (74194)

4.6 Explain the use of shift register as memory.

4.7 Classify various types of memories based on principle of operation, physical characteristics, accessing modes and fabrication technology..

4.8 Differentiate between ROM and RAM

4.9 Distinguish between EEPROM and UVPROM

4.10 Compare static RAM and dynamic RAM

5.0 Understand the combinational circuits

5.1 Draw and explain the operation of 4 X 1 Multiplexers.

5.2 Draw and explain the operation of 1 to 4 demultiplexer.

5.3 Draw and explain the operation of a 4 to 10 line decoder.

5.4 Draw and explain Decimal to BCD encoder.

5.5 List any five applications of multiplexers and demultiplexers.

5.6 List any five applications of Encorders and decoders.

COURSE CONTENTS

1. Logical Gates and Boolean algebra : AND, OR, NAND, NOT, NOR & EX-OR gates. Logical definitions – Symbols – truth tables. Boolean theorems, Boolean simplifications of Boolean expressions, Using De-Morgan's theorems, Formation and implementation of Logic expressions, Karnaugh's mapping, Applications involving developing of combinational logic circuits. Half-Adder, Full-adder, Subtractor series – Parallel Binary adder – Parallel adder/subtractor circuits.

2. FLIP FLOP: Different logic families, Basic principles of Flip Flop operation (with help of wave form & truth tables) of RS,T,D,JK and Master Slave JK flip flop concept of Edge Triggering and Level Triggering , Synchronous and Asynchronous device.

3. Counters: Basic Asynchronous, Synchronous Binary and Decade counter and the Ripple counter, their use Decade counter, Up and Down counters, Ring counter.

4. Registers and Memories : Shift registers, Serial, Parallel register, Serial-in Parallel out, Parallel-in–serial out devices, Universal shift registers, Applications, Decoders, - Multiplexers, Demultiplexers and Encoders, Shift register as memory – Classification of various types of memories - Differentiate between ROM and RAM - Distinguish between EEPROM and UVPROM - Compare static RAM and dynamic RAM

5. Combinational Circuits: Multiplexers,Demultiplexers,Encorders,Decoders

REFERENCE BOOKS

1. Digital principles and applications -- Malvino and leach

2. Digital Electronics -- Bignell - Thomson

3. Modern Digital Electronics -- R.P. Jain

COMPUTER ORGANIZATION

Subject Title : Computer Organization
Subject Code : CM – 304
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUE PRINT											
Unit No	**Major Topic**	**No of Periods**		**Weightage of marks**	**Short Type**			**Essay Type**			
		Theory	**Practice**		R	**U**	**App**	R	U	**App**	
1	CPU Organization	**8**	**2**	**18**	**1**	**0**	**0**	**½**	**1**	**0**	
2	Information representation , Arithmetic Operations	**20**		**37**	**4**			**2½**			
	Information representation	2	5	11	1	1		½			
	Arithmetic Operations using Flow charts	10	3	26	1	1	0	0	2	0	
3	Memory Organization	**8**	**2**	**18**	**1**	**0**	**0**	**½**	**1**	**0**	
4	I/O Organization	**15**		**29**	**3**			**2**			
	Concept	5	0	3	1	0	0	0	0	0	
	Interfacing methods	8	2	23	2	0	0	1	1	0	
5	Pipeline and Vector processing	**5**	**0**	**8**	**1**	**0**	**0**	**½**	**0**	**0**	
	Total	**46**	**14**	**110**	**7**	**2**	**0**	**3**	**5**	**0**	

OBJECTIVES

On completion of the study of the subject the student shall be able to

1.0 Understand the Processor Organization

1.1 Draw the functional block diagram of Digital computer and explain the function of each unit.

1.2 Draw the block diagram of simple accumulator based CPU.

1.3 Explain the function of each unit.
1.4 Define the terms micro operation, macro operation, instruction cycle, fetch cycle and execution cycle.
1.5 Define stored program concept.
1.6 Describe the sequential execution of a program stored in memory by the CPU

2.0 Comprehend the process of Information representation and Arithmetic Operation

2.1 Explain the basic types of information representation in a computer.
2.2 Define floating point representation and fixed point representation of numbers.
2.3 Illustrate the same with example.
2.4 Distinguish between Fixed point and Floating point representations.
2.5 Define Operand, Opcode and address.
2.6 Explain zero address, one address, two address and three address instructions with simple examples.
2.7 Explain addressing modes.
2.8 Explain the fixed point addition and subtraction operations with flowcharts.
2.9 Explain the Fixed point multiplication and division operations with flowcharts.
2.10 Explain floating point addition, subtraction operations with flowcharts
2.11 Explain floating point multiplication and division operations with flowcharts.

3.0 Appreciate organization of Computer Memory system.

3.1 Distinguish between main and auxiliary memory.
3.2 Explain the need for memory hierarchy in a computer.
3.3 State the significance of various memory devices characteristics: access time, access rate, alterability , permanence of storage, cycle time.
3.4 Explain Associative Memory
3.5 Explain the principle of virtual memory organization in a computer system
3.6 Explain virtual address and physical address organization.
3.7 Explain the principle and advantage of cache memory organization.
3.8 Explain the principle of memory interleaving in a computer.

4.0 Understand the input and output organization of a computer.

4.1 List the any five peripheral devices that can be connected to a computer.
4.2 Explain the need for an interface.
4.3 List out three modes of date transfer.
4.4 Explain synchronous and asynchronous data transfer.
4.5 Explain hand shaking procedure of data transfer.
4.6 Explain programmed I/O method of data transfer.
4.7 Explain interrupted initiated I/O.
4.8 Explain DMA controlled transfer.
4.9 Explain priority interrupt, polling, and daisy chaining priority.
4.10 Explain about a bus system.
4.11 List the four bus systems.

5.0 Understand Pipeline and Vector Processing

5.1 Explain the principle of Parallel processing.
5.2 Describe Flynn's classification of Parallel processing.

5.3 Explain the principle of pipeline processing.
5.4 List any five advantages of parallel processing and pipeline processing.
5.5 Explain arithmetic instruction pipeline.
5.6 Explain vector processing and array processor .

Course Contents

Processor Organization - functional block diagram of Digital computer -Simple accumulator based CPU and function of each unit.-Stored program concept

Information representation and Arithmetic Operation- Basic types of information representation - floating point representation and fixed point representation of numbers, Operand, Opcode and address - zero address, one address, two address and three address instructions - different addressing modes.-fixed point addition and subtraction, multiplication and division operations - floating point addition, subtraction, multiplication and division operations with flowcharts.

Organization of Computer Memory system - Main and auxiliary memory -Need for memory hierarchy in a computer -Significance of various memory devices characteristics: access time, access rate, alterability , permanence of storage, cycle time - Associative Memory-Virtual memory organization in a computer system - Virtual address and physical address organization.-Principle and advantage of cache memory organization- Principle of memory interleaving in a computer

Input and output organization - Peripheral devices -Need for an interface-Three modes of date transfer - Synchronous and asynchronous data transfer -Hand shaking procedure of data transfer -Programmed I/O method of data transfer-Interrupted initiated I/O-DMA controlled transfer-Priority interrupt, polling, and daisy chaining priority-Bus systems

Pipeline and Vector Processing -Principle of Parallel processing-Flynn's classification of Parallel processing -Principle of pipeline processing - Advantages of parallel processing and pipeline processing -Arithmetic instruction pipeline -Vector processing and array processor

Reference Books

1. Structured Computer Organization -- Andrews Tennenbaum.

2. Computer Organization -- Govindarajulu (TMH).

3. Computer Organization & Architecture -- William Stallings

4. Computer System Architecture --- Morris Mano

DATA STRUCTURES USING C

Subject Title : Data Structures using C
Subject Code : CM – 305
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUE PRINT										
Unit No	**Major Topic**	**No of Periods**		**Weightage of marks**	**Short Type**			**Essay Type**		
		Theory	**Practice**		R	**U**	**App**	R	U	**App**
1	**Introduction to Data structures**	**5**	**0**	**6**	**2**	**0**	**0**	**0**	**0**	**0**
2	**Linear Data structures**	**25**		**52**	**4**			**4**		
	Linked Lists	6	4	13	1	0	0	0	0	1
	Doubly Linked Lists	3	1	13	1	0	0	0	0	1
	Stack	4	3	13	1	0	0	0	0	1
	Queues	3	1	13	1	0	0	0	0	1
3	**Non Linear Data structures**	**12**		**26**	**2**			**2**		
	Basics and creation of Binary trees	3	1	13	1	0	0	1	0	0
	Traversals	4	2	10	0	0	0	0	1	0
	Applications	1	0	3	0	1	0	0	0	0
4	**Sorting**	**10**	**5**	**18**	**0**	**1**	**0**	**1**	**½**	**0**
5	**Searching**	**2**	**1**	**08**	**0**	**1**	**0**	**½**	**0**	**0**
	Total	**42**	**18**	**110**	**7**	**3**	**0**	**2½**	**1½**	**4**

OBJECTIVES

On completion of the study of the subject the student shall be able to

1.0 Understand an Overview of Data Structures

1.1. Define data structure and classify them
1.2. Explain linear data structures

1.3. Describe nonlinear data structures
1.4. Explain data types and abstract data types
1.5. State algorithm analysis for time requirements

2. Understand Linear Data structures

2.1. **Comprehend Linked list**

2.1.1. List any 3 advantages of linked lists
2.1.2. State the purpose of dummy header
2.1.3. Create a singly linked list
2.1.4. Perform insertion and deletion operation on a singly linked list
2.1.5. Know how to search and replace an element in a linked list
2.1.6. Know to reverse a singly linked list
2.1.7. Create a singly circular linked list
2.1.8. Create a doubly linked list
2.1.9. Insert and delete elements in a doubly linked list

2.2. **Understand Queues and Stacks**

2.2.1 Define stack
2.2.2 Explain the two operations of a stack
2.2.3 Implementation of stacks
2.2.4 List the five applications of stacks
2.2.5 Convert infix to postfix expression
2.2.6 Evaluate postfix expression
2.2.7 Define queue
2.2.8 Explain the operations on queues
2.2.9 Discuss application of queues
2.2.10 Explain array implementation of queue
2.2.11 Implement circular queues
2.2.12 Explain priority queues

3.0 Know the Tree structures

3.1 Define a tree
3.2 Explain the terminology related to tree
3.3 Define a binary tree
3.4 Explain the linear representation and linked list representation of a Binary tree
3.5 Write a program to create and display a tree
3.6 Perform traversal operation on trees
3.7 Construct a tree using inorder and preorder traversal
3.8 Construct a tree using inorder and postorder traversal
3.9 Convert of general trees to binary trees
3.10 Perform operations on a binary tree
3.11 List any 3 Applications of trees

4.0 Understand various Sorting techniques

4.1 Define sorting
4.2 State the need of sorting
4.3 List the four methods of sorting
4.4 Explain the method of bubble sort
4.5 Write the algorithm for bubble sort and define its complexity
4.6 Discuss the program for bubble sort
4.7 Explain the method of selection sort
4.8 Write the algorithm for selection sort and define its complexity
4.9 Discuss the program for selection sort
4.10 Explain the method of insertion sort
4.11 Write the algorithm for insertion sort and define its complexity
4.12 Discuss the program for insertion sort
4.13 Explain the method of quick sort
4.14 Explain the method of merging two sorted lists
4.15 Discuss the program to implement merge sort on two sorted lists

5.0 Understand different Searching Techniques

5.1 Define searching
5.2 State the need of searching
5.3 List two types of searching
5.4 Explain the method of Linear Search
5.5 Write the algorithm for Linear Search and its complexity
5.6 Discuss the program for Linear Search
5.7 Explain the method of Binary Search
5.8 Write the algorithm for Binary Search and its complexity
5.9 Discuss the program for Binary Search

COURSE CONTENTS

1. Introduction to data structures

Data structures – Linear & non linear, data types and abstract data types, algorithm analysis for time and space requirements.

2. Linear data structures

Linked Lists – Singly linked lists – Create, insert, delete, sort, search and replace an element in a linked list – Reverse, Create singly circular linked list. Doubly linked list – Create, insert, delete elements in doubly linked list - Create doubly linked circular list.

Queues and stacks

Implementation of stacks, application of stacks, converting infix to postfix expression and evaluation – Applications & Implementation of queues, Circular queues, Priority queue.

3. Non Linear Data Structures

Trees

Trees –Binary trees – Linear representation – Linked list representation, tree traversals, Tree Conversion & Applications

4. Sorting

Introduction to different sorting techniques – selection, insertion, bubble, quick & merge.

5 Searching

Introduction to different searching techniques – sequential and binary.

REFERENCE BOOKS

1. Data Structures: A Pseudocode Approach with C - Gilberg / Forouzan
2. Data Structures using 'C' - Tanenbaum langsam and Augonstein (PHI).
3. Data structures through C - Yashwanth Kanetkar
4. An Introduction to data structures with applications - Tremblay & Sorenson

Subject Title : RDBMS
Subject Code : CM - 306
Periods per week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUE PRINT										
Unit No	**Major Topic**	**No of Periods**		**Weightage of marks**	**Short Type**			**Essay Type**		
		Theory	**Practice**		R	**U**	**App**	R	U	**App**
1	**Concept of DBMS & RDBMS**	**15**		**29**		**3**			**2**	
	Basic concepts	6	0		2	0	0	1	0	0
	Database Design	6	3		0	1	0	0	1	0
2.	**Concept of SQL**	**12**		**24**		**3**			**1½**	
	SQL Basics	2	0	8	1	0	0	½	0	0
	SQL Functions	4	3	13	0	1	0	0	**1**	0
	DDL and DML	2	1	3	0	1	0	0	0	0
3.	**Management of schema Objects**	**8**	**2**	**18**	**1**			**1½**		
4.	**PL/SQL**	**13**		**23**		**1**			**2**	
	Basics of PL/SQL	3	1	13	1	0	0		1	
	Exceptions	2	1	5	0	0	0		½	
	Sub Programming	3	3	5	0	0	0		½	
5.	**Advanced PL/SQL**	**10**		**16**		**2**			**1**	
	Cursers	2	1	3	0	1	0	0	0	0
	Stored Program	2	2	10	0	0	0	0	1	0
	Packages	2	1	3	0	1	0	0	0	0
	Total	**42**	**18**	**110**	**5**	**5**	**0**	**3**	**5**	**0**

OBJECTIVES

On completion of the study of the subject the student shall be able to

1.0 Understand the concept of DBMS & RDBMS

1.1 Define Database System
1.2 List atleast five advantages of Database System
1.3 Explain what is meant by data base abstraction
1.4 Explain Data models
1.5 Define instances and schemes
1.6 Explain data independence.
1.7 Explain data definition language
1.8 Explain data manipulation languages
1.9 Explain data base manager

1.10 Explain data base administrator and users
1.11 Describe the overall system structure
1.12 Explain entity and entity sets
1.13 Explain relationship and relationship sets
1.14 Define the terms super key , candidate key and primary key
1.15 Explain mapping constraints
1.16 Reduce the ER diagrams to tables
1.17 Explain generalization, specialization and aggregation
1.18 Explain Functional Dependencies
1.19 Describe Normalization– 1st NF, 2nd NF, 3rd NF
1.20 Explain E.F.CODD's rules for RDBMS

2.0 Understand the concept of SQL

2.1 Explain benefits of SQL
2.2 Describe about embedded SQL, Lexical conventions, oracle tools support for SQL
2.3 Describe Naming of the Objects and parts and how to refer them
2.4 Explain referring of the object in remote data bases
2.5 Explain literals, text and integers
2.6 Explain the different data types like character, number long, date, raw and long raw etc.
2.7 Illustrate pseudo-columns
2.8 Illustrate the comments within SQL Statement
2.9 List and explain the functions like single row, character, conversion and group functions

2.10 Explain date and number format models
2.11 Describe commands of SQL like data definition language commands, data manipulation language commands, transaction control commands.
2.12 Explain Sub queries
2.13 Explain Joins and types of Joins

3.0 Understand the management of schema objects

3.1 List atleast five schema objects
3.2 Explain the guidelines for managing schema objects
3.3 Explain the management of space usage of data base table etc
3.4 Explain the procedure of creating, altering and dropping tables
3.5 Explain the management of sequences like creating altering ,dropping etc
3.6 Explain the various synonyms management like creating, dropping etc
3.7 Describe steps of managing indexes
3.8 Define clusters
3.9 List two types clusters
3.10 State the purpose of clusters
3.11 Define view
3.12 Explain types of views
3.13 Illustrate creation of views from multiple tables
3.14 List atleast three advantages of views.
3.15 Explain management of integrity constraints like Primary key, Foreign key, Unique key, check constraint and illustrate

4.0 Understand PL/SQL

4.1 Explain the architecture of PL/SQL.
4.2 List atleast five features of PL/SQL
4.3 Explain the data types
4.4 Illustrate declarations and naming conventions of variables
4.5 List atleast five built in functions.
4.6 Explain PL/SQL tables and user defined records.
4.7 Explain decision making statements and illustrate
4.8 Explain looping statements and illustrate
4.9 Define the term Exception handling
4.10 Illustrate five built in Exceptions
4.11 Illustrate User defined Exceptions
4.12 List any four advantages of Exception handling
4.13 Explain the advantages and features of Exceptions.
4.14 Explain the propagation and re-raising of Exceptions.
4.15 Describe the advantages of sub programs.
4.16 List and explain the various statements and declarations for procedures and functions.

4.17 Explain three parameter modes in PL/SQL with examples
4.18 Illustrate parameter default values in PL/SQL procedures and functions
4.19 Explain PL/SQL global, local and system variables.
4.20 Define recursion
4.21 Explain recursion with an example

5.0 Understand Advanced PL/SQL.

5.1 Explain cursor attributes and cursor management
5.2 Explain database triggers
5.3 Explain the concept of stored sub programs with examples
5.4 List atleast five advantages of packages.
5.5 Explain the specifications of packaging.
5.6 Explain overloading and calling packaged sub programs.

COURSE CONTENTS

Concept of DBMS

Define Database – Advantage of Dabatabse- data Abstraction – Data Models – Instances and schemes – Data independence – Data Definition Language- Data manipulation Language – Data base manager – Data base Administrator - Database users – Overall system structure.

Entities and entity sets – Relationships and Relationship sets – mapping constraints – Entity – Relationship Diagram – Super key , candidate key and primary key - Reducing E-

R Diagrams to tables – Generalization and specialization – Aggregation – Functional Dependencies - Normal forms 1^{st} , 2^{nd} , 3^{rd}- EFCODD rules for RDBMS

Concept of SQL

Benefits of SQL – Embedded SQL – Lexical conversions – ORACLE tools support for SQL. Naming object and parts – Referring objects and parts – Referring to object in remote databases- Literals – Text –Integer – Number – Data types – Character data types – Number data type – Long data type – Data type Raw and long raw data types – Nulls – Pseudo columns – comments within SQL statements – comments on schema objects.

Operators – Unary and Binary operators – Precedence- Arithmetic operators – character operators – comparison operators – logical operators- se operators – other operators – functions – single row functions – number functions – character functions – row functions – number values – data functions – conversion functions – other functions- date format models .

SQL commands, data definition language commands data manipulation language commands. Transaction control commands-Subqueries - Joins .

3. Schema objects

Guidelines for Managing schema objects – managing the space usage of data blocks – setting storage parameters – understanding space use of datatypes – managing tables – creating tables – alter tables – dropping tables – managing sequences – creating sequence – altering sequences- initialization parameters affecting – sequences – dropping sequences – managing synonyms – creating synonyms – dropping synonyms – managing indexes – guidelines for managing indexes – calculating space for indexes – creating indexes – indexed tables, and cluster indexes – guidelines for managing clusters, calculating space required by clusters – creating clusters, clustered tables, and cluster indexes – for – clustered tables and cluster indexes – Altering clusters– Dropping clusters, clustered tables, and cluster indexes – managing hash cluster and clustered tables miscellaneous management for schema objects – creating views – renaming schema objects var type, tables, indexes and clusters – truncating tables and clusters – managing integrity constraints.

4.Elements of PL/SQL

Main features – architecture – advantage of PL/SQL – fundamentals – character set – Lexical units – Data types – data type conversion – declarations – naming conventions – scope and visibility – assignments – expressions and comparisons – built – in functions – PL/SQL tables – user defined records.

Conditional control IF statement – sequential control GOTO and NULL statements.

SQL support – national language support – Remote Access

Advantages of exceptions – predefined exceptions – user defined exceptions – how exceptions propagate – raising an exception – useful techniques.

Advantages of subprograms – procedures – Functions RETURN statement – forward declarations – actual versus formal parameters – positional and named notation parameter modes – parameter default values – overloading recursion

5.Advanced PL/SQL

Advantages of Stored programs – CURSORS - Advantages of Dabatase Triggers - Advantages of packages – the package specification – the package body – overloading – calling packaged subprograms – package state and dependency – package standard.

REFERENCE BOOKS

1. Understanding ORACLE ---- James T. Peary & Joseph G. Laseer.

2. RDBMS with ORACLE -- Rolland.

3. ORACLE series books of ORACLE Press – TMH.

4.Starting out with Oracle – Covering Databases -- John Day & CraigVan 5.SQL,

5.PL/SQL, Developer Tools & DBA --- Slyke, Dreamtech

6. Relational Database Management Systems ----ISRD Group, TMH

CM-307 DIGITAL ELECTRONICS LAB PRACTICE

Subject Title : Digital Electronics Lab Practice

Subject Code : CM-310

Periods/Week : 03

Periods/Semester : 45

LIST OF EXPERIMENTS

1. Identification of Digital Ics and noting down pin details from data sheets Identify the given digital ICs and draw the pin diagrams. (use TTL and CMOS ICs of AND, OR,NOT, NAND, NOR and XOR gates with two and three inputs)

2. Verify the truth tables of AND, OR,NOT, NAND, NOR and ExOR Gates

3. Realize AND , OR , NOT , XOR functions using NAND only, NOR only

4. Verify Demorgan's Laws using given digital trainer kit and given TTL gates

5. Construct Half adder and full adder circuits and verify their functionality

6. To construct clocked Flip Flops using Logic gates/Digital Trainer kits and Verify its truth table.

   a)Verify the truth table of CD 4013 Dual D flip Flop

   b)Verify the functionality and truth table of 74L71 RS flip flop with Preset and Clear

   c) Verify the Truth table of JK FF using 7476 IC.

   d) Construct D and T flip flops using 7476 and verify the truth tables.

   e) Use Digital trainer kits where ever it needs for above experiments

7. To construct and verify the function of Asynchronous counters

8. To construct and verify the function of decade counter using 7490 ICs.

   a) change the modulus of the counter

   b) display decimal number using 7447

9. To Construct and verify the function of Synchronous counters

10. To construct and Verify the function of up/down counter

11. To construct and Verify the function of shift register

12 . To study the Features of features of Encoders and Decoders

13 . To study the Features of features of Multiplexers and Demultiplexers

14 Setup a circuit of a single decimal 4-bit BCD and vice-versa using gates

15 Setup a circuit for displaying hexadecimal code on a 7 segment display

16 To verify truth table and to study the operation of tri-state output buffer

17. To verify the function of 4-bit magnitude comparator using logic gates

DATA STRUCTURES LAB PRACTICE

Subject Title : Data Structures Lab Practice

Subject Code : CM – 308
Periods per Week : 04

Periods per Semester : 60

LIST OF EXCERCISES

1. Exercises on creation, insertion, deletions & display of elements in a singly linked lists

2 Write a program to implement a singly circular linked list

3. Exercises on creation, insertion, deletions & display of elements in a doubly linked lists

4. Write a program to Implement a stack

5. Write a program to implement a queue

6. Write a program to create a binary tree & its traversal operations

7. Exercise on Selection sort

8. Exercise on insertion sort

9. Exercise on bubble sort

10. Implement a program for merge sort on two sorted lists of elements

11. Exercises on linear search

12. Exercise on binary search

DATA STRUCTURES LAB PRACTICE OBJECTIVES AND KEY COMPETENCIES			
Sl.No	Name of the Experiment	Objectives	Key Competencies
1	Exercises on creation, insertion, deletions & display of elements in a singly linked lists	Write a C program for i. Creation of linked list ii. Inserting an element in Linked list iii. Check for deletion of a node if no element is present and print error message iv. Delete an element from the Linked list v. Display all the elements from the linked list	❖ Rectify syntactical errors ❖ Debug logical errors ❖ Study node structure ❖ Validate whether the memory allocation is done for the node ❖ Confirm whether the addition of node is done at the end ❖ Correct if deletion of an element in an empty list ❖ Confirm whether deletion of required node is done ❖ Observe whether all the elements of the linked list are displayed in proper order
2	Write a program to implement a singly circular linked list	Write a C program for i. Creation of linked list ii. The last node is pointing to the first node of the list iii. Display all the elements from the Circular linked list	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe node structure ❖ Validate whether the memory allocation is done for the node ❖ Validate whether the last node is pointing to the first node of the linked list ❖ Compare whether linked list and circular linked list is properly understood
3	Exercises on creation, insertion, deletions & display of elements in a doubly linked lists	Write a C program for i. Creation of double linked list ii. Traversal of nodes is properly done in bi-direction iii. Display all the elements from either directions from the node iv. Insertion of a new node in the existing list vi. Check for deletion of a	❖ Rectify syntactical errors ❖ Debug logical errors ❖ Observe node structure ❖ Validate whether the memory allocation is done for the node ❖ Verify whether the nodes are properly pointing to the previous and next nodes ❖ Verify whether the traversal is done from both directions ❖ Verify whether a new node is properly inserted in the

DATA STRUCTURES LAB PRACTICE OBJECTIVES AND KEY COMPETENCIES			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		node if no element is present and print error message v. Deletion of the required node in the double linked list	double linked list ❖ Observe proper traversal of the list through newly inserted node in the existing list ❖ Correct if deletion of an element in an empty double linked list ❖ Proper traversal of the list after deletion of node in the existing list
4	Write a program to Implement a stack	Write a C program for i. Creation of Stack consisting of elements using arrays ii. Insertion of new element is done by push() function call iii. Deletion of last element is done by pop() function call iv. Print error message for 'empty stack' if no elements are present for pop() function call v. Print error message for 'stack full' if number of elements exceed size of Stack array	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe declaration of stack using arrays ❖ Validate whether a new element is inserted at the top by push() function call ❖ Check whether only the top element is deleted by pop() function call ❖ Verify for empty stack condition in pop() ❖ Verify for stack full condition in push()
5	Write a program to implement a queue	Write a C program for i. Creation of Queue consisting of elements using arrays ii. Insertion of new element is done by add_Queue() iii. Print error message for 'empty queue' if no elements are present for deletion of an empty queue. iv. Print error message for	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe declaration of Queue using arrays ❖ Validate whether a new element is inserted at the end of the array by add_Queue() ❖ Verify for empty Queue condition for deletion of an element ❖ Verify for Queue full condition upon insertion of a new

DATA STRUCTURES LAB PRACTICE OBJECTIVES AND KEY COMPETENCIES			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		'queue full' if number of elements exceed size of Queue array upon insertion of new element. v. Deletion of first element is done by delete_Queue()	element ❖ Check whether only the first element is deleted by delete_Queue()
6	Write a program to create a binary tree & its traversal operations	Write a C program for i. Creation of Binary Trees ii. Creation of elements at proper levels iii. Insertion of a node iv. Perform In-order Traversal of the binary tree v. Perform Pre-order Traversal of the binary tree vi. Perform Post-order Traversal of the binary tree	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe proper definition of elements in a Binary Tree ❖ Check whether the node is properly inserted in the Binary Tree ❖ Validate whether the Tree in-order traversal is properly done ❖ Validate whether the Tree pre-order traversal is properly done ❖ Validate whether the Tree post-order traversal is properly done
7	Exercise on Selection sort	Write a C program for i. Implementing selection sort ii. Printing the list after selection sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe whether selection sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the selection sort is performed for the given unordered list
8	Exercise on insertion sort	Write a C program for i. Implementing insertion sort ii. Printing the list after insertion sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe whether insertion sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the insertion sort is performed for the given unordered list

DATA STRUCTURES LAB PRACTICE OBJECTIVES AND KEY COMPETENCIES			
Sl.No	Name of the Experiment	Objectives	Key Competencies
9	Exercise on bubble sort	Write a C program for i. Implementing Bubble sort ii. Printing the list after insertion sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe whether Bubble sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the Bubble sort is performed for the given unordered list ❖ Check the efficiency of the program if the given list is almost sorted
10	Implement a program for merge sort on two sorted lists of elements	Write a C program for i. Implementing merge sort ii. Printing the list after merge sort is performed	❖ Correct syntactical errors ❖ Debug logical errors ❖ Check whether two separate sorted lists are properly stored in separate arrays ❖ Observe whether Merge sort algorithm is properly implemented ❖ Check whether the sorted list is generated after the Merge sort is performed for the given two separate lists
11	Exercises on linear search	Write a C program for i. Implementing Linear Search ii. Print the proper result for successful and unsuccessful search	❖ Correct syntactical errors ❖ Debug logical errors ❖ Check whether Linear Search algorithm is properly implemented ❖ Observe the result for the search element is present in the list ❖ Observe the result for the search element is not present in the list
12	Exercise on binary search	Write a C program for i. Implementing Binary Search ii. Print the proper result for successful and	❖ Correct syntactical errors ❖ Debug logical errors ❖ Check whether Binary Search algorithm is properly implemented

DATA STRUCTURES LAB PRACTICE OBJECTIVES AND KEY COMPETENCIES			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		unsuccessful Binary search	❖ Observe the result for the search element is present in the list ❖ Observe the result for the search element is not present in the list

RDBMS LAB PRACTICE

Subject Title	**:**	**RDBMS Lab Practice**
Subject Code	**:**	**CM- 309**
Periods per week	**:**	**03**
Periods per Semester	**:**	**45**

1 Know installation of Oracle
2 Exercise on creating tables
3 Exercise on inserting records
4 Exercise on updating records
5 Exercise on modifying the structure of the table
6 Exercise on Select command
7 Exercise on querying the table using clauses like WHERE, ORDER, IN, AND, OR, NOT
8 Exercise on creating and deleting of indexes
9 Exercise on various group functions
10 Exercise on Number functions, character functions, conversion functions and date functions
11 Exercise on set operators
12 Exercise on sub queries
13 Exercise on Joins
14 Exercise on various date and number format models
15 Exercise on Sequences
16 Exercise on synonyms
17 Exercise on views
18 Exercise on creating tables with integrity constraints
19 Write programs using PL/SQL control statements
20 Exercise on PL/SQL cursors
21 Exercise on PL/SQL exception handling
22 Exercise on Procedures
23 Exercise on Functions
24 Exercise on Recursion
25 Exercise on Triggers
26 Exercise on Packages

RDBMS LAB PRACTICE			
Sl.No	Name of the Experiment	Objectives	Key Competencies
1	Know installation of Oracle	Perform the following: i. To identify the version of Oracle being installed ii. To understand the RAM and HDD requirements for Oracle installation iii. To comprehend the installation steps correctly iv. Setting up of Oracle Administrative Password v. Configuring the Oracle database after post-installation steps of Oracle viz configuring administrative rights for performing vi. To login to Oracle as administrator account and Oracle user account	❖ Observe Oracle version being installed ❖ Observe the RAM & HDD requirements ❖ Rectify for any Oracle installation errors ❖ Able to login as Administrator and as Oracle user account
2	Exercise on creating tables	Perform the following: i. To login with Oracle user account ii. To give correct syntax for table creation iii. To give correct data type for the required fields with appropriate size iv. To display the structure of the table	❖ Correct Table creation syntax errors ❖ Correct the wrong data types and inappropriate sizes for the respective fields ❖ Check for displaying the structure of the table
3	Exercise on inserting records	Perform the following: i. Check for the required table present already ii. To insert the records correctly iii. To display the records correctly	❖ Correct syntax errors for Insertion of record ❖ Check for insertion of proper values for the required fields ❖ Verify the correct values pertaining to the record are inserted in the required table ❖ Check for displaying of the records correctly
4	Exercise on updating records	Perform the following: i. Check for the required table	❖ Correct syntax errors for updation of record

RDBMS LAB PRACTICE			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		present already ii. To update the records correctly iii. To display the updated records	❖ Check for updation of proper values for the required fields ❖ Check for displaying of the updated records correctly
5	Exercise on modifying the structure of the table	Perform the following i. To identify the required table present in the system already ii. To add new column iii. To display the records correctly	❖ Correct syntax errors in modifying the structure of the table ❖ Check whether required field is newly added to the existing table ❖ Check for displaying of the modified table correctly
6	Exercise on Select command	Perform the following i. To identify the required table present already ii. To display the records in the required table	❖ Check for syntax error in usage of Select command ❖ Check whether Select command is given correctly to display all the records
7	Exercise on querying the table using clauses like WHERE, ORDER, IN,AND, OR, NOT	Perform the following: i. To use the Select command ii. To use the clauses WHERE, ORDER, IN,AND, OR, NOT alongwith Select command on the given records in the table	❖ Check for syntax error in usage of Select command with appropriate clauses ❖ Check whether Select command alongwith appropriate clause is given correctly for the required condition ❖ Check the usage of clauses WHERE, ORDER, IN,AND, OR, NOT alongwith Select command appropriately
8	Exercise on creating and deleting of indexes	Perform the following i. To create index on a single column in a Table ii. To create index on more than one columns in the Table iii. To drop the index	❖ Check for syntax error in usage of Index command ❖ Check for creation of index on single column index ❖ Check for creation of index on more than one columns (Composite Index) ❖ Check for the usage of

RDBMS LAB PRACTICE			
Sl.No	Name of the Experiment	Objectives	Key Competencies
			dropping the index
9	Exercise on set operators	Perform the following i. To use set command ii. To use set command along with WHERE condition	❖ Check for syntax error in the usage of SET command ❖ Check for usage of SET command for updating values based on certain condition on few records
10	Exercise on sub queries	Perform the following i. To use Select command ii. To use appropriate Operators - IN	❖ Check for the syntax error in usage of sub queries ❖ Check for the correctness of the usage of appropriate operators used
11	Exercise on Joins	Perform the following i. To create two tables ii. To use the common field if two tables are used iii. To know different types of Join	❖ Check for the correctness of the syntax used for joining ❖ Check if the join is created between two tables ❖ Check if self join is created
12	Exercise on various date and number format models	Perform the following: i. To use date formats correctly ii. To use number formats correctly	❖ Check for the syntax of the date formats ❖ Check for the syntax of the number formats
13	Exercise on Sequences	Perform the following i. Create a sequence ii. Usage of sequence alongwith NEXTVAL()	❖ Check for the syntax of Sequence ❖ Check for the usage of sequence variable alongwith NEXTVAL()
14	Exercise on synonyms	Perform the following: i. Create Synonym for a Table, View, Sequence etc. ii. Using of Synonym	❖ Check for the syntax of Synonym ❖ Check for the correctness of implementation of Synonym
15	Exercise on views	Perform the following i. Create View for a certain collection of records in a Table ii. Query the View	❖ Check for the syntax correctness of View ❖ Check for the correctness of the implementation of View
16	Exercise on creating tables with integrity constraints	Perform the following i. Create primary key	❖ Check for the syntax errors in usage of all types of

RDBMS LAB PRACTICE			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		ii. Create Foreign key or referential integrity constraint iii. Create NOT NULL constraint iv. Create UNIQUE Key constraint v. Create CHECK constraint	Integrity constraints ❖ Check whether different types of Integrity constraints are used
17	Exercise on PL/SQL Implicit cursors	Perform the following i. Know different types of cursors- Implicit and Explicit cursors ii. Use appropriate attributes of Implicit Cursor for checking updations iii.	❖ Check for the syntax errors in using attributes ❖ Check whether all the attributes relevant to implicit cursors are used ❖ Check for proper conditions using appropriate attributes to test whether updations are performed
18	Exercise on PL/SQL Explicit cursors	Perform the following i. Know different types of cursors- Implicit and Explicit cursors iv. Create Explicit cursors by declaration v. Open the Explicit cursor vi. Fetch the data vii. Close the Explicit cursor viii. Use appropriate attributes of Explicit cursor for checking updations	❖ Check for the syntax errors in using attributes ❖ Check whether all the attributes relevant to explicit cursors are used ❖ Check for proper conditions using appropriate attributes ❖ Check for proper conditions using appropriate attributes to test whether updations are done
19	Write programs using PL/SQL control statements	Perform the following i. To use IF .. ELSE statements ii. To use iterative statements – Simple loop, While Loop, For Loop	❖ Check for the syntax of IF.. ELSE statements ❖ Check for the syntax of all iterative statements
20	Exercise on PL/SQL in built exception handling	Perform the following i. Know about types of exception handling ii. To handle built-in exceptions ii.	❖ Check for handling of inbuilt exceptions ❖ Check for raising of user defined exception ❖ Check for handling of user defined exception with appropriate error messages

RDBMS LAB PRACTICE			
Sl.No	Name of the Experiment	Objectives	Key Competencies
21	Exercise on PL/SQL in user defined exception handling	Perform the following i. To declare user defined exception ii. To raise user defined exception iii. To handle user defined exception	❖ Check for declaration of user defined exception ❖ Check for proper raising of exceptions ❖ Check for proper handling of user defined exception with appropriate error messages
22	Exercise on Procedures	Perform the following i. To know the concept of stored procedures ii. To declare procedures iii. The type of parameters IN,IN OUT, OUT iv. To call procedures from other procedures	❖ Check for proper declaration of procedures ❖ Check for syntax of parameters and its type ❖ Check for proper calling of procedures
23	Exercise on Functions	Perform the following i. To know the concept of stored functions ii. To declare function with return data iii. To call functions from other functions	❖ Check for proper declaration of function ❖ Check for syntax of parameters and its data type ❖ Check for proper return data type from the functions ❖ Check for variable assignment to get the returned value from the function
24	Exercise on Recursion	Perform the following i. To know the concept of stored functions and stored procedures ii. To call the procedure and function by itself ii. To place a condition to terminate from calling itself	❖ Check for the syntax of stored function or procedure ❖ Check for calling the function or procedure in the same function / procedure ❖ Check for the condition to terminate from calling itself
25	Exercise on Triggers	Perform the following i. To know the concept of Trigger ii. To know the types of Triggers	❖ Check for the syntax of Trigger ❖ Check for proper

RDBMS LAB PRACTICE			
Sl.No	Name of the Experiment	Objectives	Key Competencies
		iii. To know about Row level trigger and Statement level trigger iv. To know the hierarchy of trigger is fired	declaration of when the trigger is to be fired
26	Exercise on Packages	Perform the following i. To know the concept of Package specification ii. To know the concept of Package body specification iii. To know the usage of package elements	❖ Check for the syntax of Package specification ❖ Check for the syntax of Package body specification ❖ Check for the proper usage of Package elements

ELECTRONIC WORKSHOP PRACTICE

Subject title : Electronic Workshop Practice
Subject code : CM-310
Periods per week : 3
Periods / Semester : 45

TIME SCHEDULE

Sl NO	Major Topics	Periods
1	Identification of different Tools and Materials and their working	5
2	Soldering practice and Preparation of PCB	15
3	Study and use of Electronic equipment	15
4	Testing of Electronic components and characteristics	10
	Total Periods	45

List of the Experiments

Exp No	Name of the Experiment	Objectives	Key competencies
1	Know the safety precautions and first aid	a) Precautions to be followed in the laboratory ,(starting and Stopping of equipment / Machinery) b) symbols and their meaning c) Clear understanding of emergencies , b) Sequence of actions to be carried out c) basic first aid procedure	a) Take precautions to prevent accidents in the laboratory b) Alerting under emergency situations c) Basic first aid.
2	Cleaning the equipment and Work Tables including Visual inspection -reporting any physical damage	Keeping work area clean Familiarization with equipment Procedure for cleaning Use of Detergents, Shampoos and solvents. Precautions to be taken (use of masks, Gloves	Should be able to clean the equipment with appropriate cleaning agent. Report any damage to the power cords , missing fuses , Low

		etc) Precautions to be taken a) Handling the equipment b) Personal (Washing hands with soda after cleaning the equipment)	battery in DMMS etc.
3	Identification of different wires and cables 1) Identifying different wires and cables used in the industry Hookup wires a. PVC wire b. Teflon wires c.single strand d. multi strand 2) Wires used for electrical wiring a. Service wire b. TRS wires /PVC Wires (Al and Cu) c. single strand d. Multi strand e. twisted Flexible pair wires f. Enameled copper wire 3) a. Power cord. b. UTP cables c.Co axial cables d. Flat ribbon cable for antennas e.Telephone cable f.Ethernet cable g. Ribbon cables h. Optical fiber	Knowing the technical names of the wires Knowing the gauge of the wire Knowing the insulation used and its purpose Identifying the difference between single strand and Multistrand wire Selecting a wire for a particular application Finding the current carrying capacity from the gauge of wire (refer to the standard tables)	Identifying the type of wire and its current carrying capacity
4	Troubleshooting/soldering a) Soldering Iron b) lead c) wax d)brush	Identify the problem in electronic gadgets by testing it with a) physical observation b) Using multi-meter c) using voltmeter	Identifying and rectifying the problem in Electronic Gadgets

5	Soldering practice a. Making wire tips b. joining wires c. joining components d. populating simple circuits like, Audio amplifier on a breadboard e. testing the soldered connections using multimeter	Know the metals which can be soldered Know the solder specifications Know the use of Flux in soldering Practice the soldering Practice Desoldering using Desoldering Wick and Desoldering Pump	Practicing soldering and Desoldering Populating PCBs
6	Practice Desoldering using Desoldering Wick and Desoldering Pump		
7	Using General purpose PCB a) Populating the circuits b) Making necessary cuts and joints c) Use of jumper wires d) Terminating all end connections near an edge. e) Following the colour code for connecting wires. f) Using solderless bread board	Bending the components Designing the component lay out Use of common Ground Populating the circuit Cutting and joining the tracks wherever necessary Knowing the colour code foor wires Using solderless bread board	Solder the circuit on a general purpose PCB and Testing Using solderless Bread board
8	Identifying and drawing Electronic circuit Symbols Identification of meters and equipment 1. DMM 2. Analog Multimetr 3.DC Voltmeters/Ammeters 4. DC Power supply	To know the symbols used in Electronic Circuits Identifying the meters and equipment Know their purpose	To know the symbols used in Electronic Circuits Identifying the meters and equipment

	5. DRB 6. DCB 7. DIB 8. CRO 9. Function Generator etc		
9	Working with Multimeter a) Measuring the resistance using multimeter b)Testing the wire continuity with multimeter c) Measurement of Battery Voltage using Voltmeter and Multimeter	Identifying analog and Digital multimeters Selecting the correct Range Measuring Voltage , Current and Resistance with Multimeter	Use the Multimeter
10	Working with Resistors Identify different types of resistors Resistance colour code Connecting resistors in series and parallel and measuring the resistance using multimeter Rheostat connections	Identify different types of resistors Find the value of Resistance from colour code of CFR ang MFR types Identifying the terminals on Rheostat Setting the Rhrostat to Minimum and Naximum positions Observing Resistance change using DMM	Identifying resistance type by observation Finding the value of Resistance from colour code of CFR ang MFR types Setting the Rhrostat to Minimum and Naximum positions
11	Connecting batteries in series and parallel and observing the output voltage using DMM	To reinforce the practice of DMM To practice Series and Parallel connection of Cells Observe the polarity To observe the effect on Terminal Voltage	Make sries and parallel connection of batteries Use DMM to measure Voltage

12	Measurement of DC Voltage and DC current	Connecting Voltmeter and Ammeter to measure DC Voltage and Current using Voltmeter and Ammeter	measure DC Voltage and Current using Voltmeter and Ammeter
13	Verification of Ohms Law	To verify ohms law and establish relation between Voltage current and Resistance	Perform experiment as per procedure and draw inference
14	Measurement of Resistance using Voltmeter and DRB	Learn to Use the DRB Applying Ohms law in practical situations	Measure the Resistance using Voltmeter and DRB
15	To Verify the laws of Resistance using a nichrome wire and Multimeter	To understand the laws of Resistance by experimental verification Reinforce the skills of using Multimeter	Use the multimeter to measure Resistance
16	Verify the effect of temperature on Resistance Using electric lamp and Multimeter, Voltmeter and Ammeter	Observing the difference between Cold Resistance and Hot Resistance	Measuring Voltage current and resistance
17	Investigate voltage and current relationship in series and parallel resistive circuits	Observing branch currents in series Parallel circuits Verifying current division in parallel circuits with calculated values	Measuring currents and Voltages and drawing inferences
18	Experimenting with transformer a)Identify the transformer type based on tappings i. Center tapped ii. Multi tapped iii. Normal b) Test the given transformer using a multimeter identify the windings c) Find the Transformation	a)Identify the transformer type based on tappings i. Center tapped ii. Multi tapped iii. Normal b) Test the given transformer using a multimeter identify the windings c) Find the Transformation ratio d) Demonstrate that transformer can step up or step	Identifying the type of transformer Testing the transformer

	ratio d) Demonstrate that transformer can step up or step down the voltage	down the voltage	
19	Identify different types of capacitors a) Find the value/specifications of capacitor from Value printed ,and from Color code	Identifying different types of capacitors by their name Know the specifications and Ratings Find the value of capacitor from the colour code	
20	Demonstrate that capacitor can hold charge ,charging and discharging require a specific time using an LED a) Investigate the effect of connecting capacitors in series and parallel b) Testing the capacitor Using multimeter, AC source (Transfomer / Function generator) and headphones	Learn the behavior of capacitor by experimentation Connecting Capacitors in series and parallel and observing the effect on total capacitance Testing the capacitor using multimeter and other methods	Understand the behavior of capacitors Testing the capacitors
21	Black box testing a) identify the given component concealed in a box with two terminals available for testing using multimeter	Identifying a given component only by testing Develop cognitive and Motor skills	Test the given component using Multimeter
22	Identifying different switches a) Identify different types of switches and their symbols b) Toggle switches Rotary switches, Push button switches, DIP switches	Identifying different types of switches by observation , By name and symbol Using DPDT switch to reverse the Direction Tape recorder	Identify the type of switch and its name Use DPDT switch

	b). Controlling a small Tape - recorder motor with a DPDT switch to run in forward and Reverse Directions.	motor Observing the constructional details and ratings of tape recorder motor	
23	Connect a Fan regulator to ceiling fan and observe the rotary witch connections and power Resistors	Identifying and Using the Rotary switch Know the Fan Regulator connections Understand the working of Fan Regulator Identify the type of Resistors used in the Fan Regulator	Know the Fan Regulator connections
24	Testing the relay a) Use of NO and NC Contacts b) Using the relay to control a lamp load c) Using the double pole relay to control a fan motor d) Making a simple relay motor control using double pole relay and push button switches	Know the constructional details of Relay Testing/identifying the coil connections with Multimeter Understand the purpose of Relay experimentally Use the relay in practical circuits	Testing and using the relay
25	Identify the Bimetallic strip (used in Iron box) ande observe its construction a) Open the tube light starter and observe its construction. b) Connect a tubelight starter in series with an incandescent lamp and observe the operation of	Identification of Bimetallic Strip Understanding the behavior of Bimetallic strip Know the constructional details of tube light starter Application of bimetallic strip in practical circuits	Identifying Bimetallic strips Use the Bimetallic strips in applications.

	bimetallic strip		
26	Identifying different types of connectors a) Identifying power connectors b) Molex connectors c)Edge connectors d)Terminal blocks e) Wire to Board, Board to Board , Flat cable connectors Keyed connectors for microphone Male and Female types f) Lugs , Blade connectors, Ring and spade terminals etc	Identifying different types of connectors used in electronic circuits by their name Know the choice of connector based on the requirements	Identifying different types of connectors used in electronic circuits by their name and use them in the circuits
27	Amplifier- Speaker and microphone connections	To know the amplifier an d speaker connections Impedance matching Knowing the various front panel and back panel controls	Connect the amplifier , microphone and speakers
28	Group Project: Assemble and test a small 0 to 12V , 500mA DC Power supply using Multi tapped transformer and a Rotary switch with enclosure	To reinforce the skills of a. Reading the circuit diagram b. Using the Electronic components c. Populating on General purpose PCB d. Reinforce mechanical skills e. Learn testing skills f. Building creativity	Complete the project and Test it

IV SEM

ENGINEERING MATHEMATICS – III

(Common to all Branches)

Subject title : Engineering Mathematics - III
Subject code : CM-401
Periods per week : 3
Periods / Semester : 45

Blue Print

S. No	Major Topic	No of Periods	Weightage of Marks	Short Type			Essay Type		
	Unit -I Differential Equations			**R**	**U**	**App**	**R**	**U**	**App**
1	Homogenous Linear Differential equations with constant coefficients	5	6	2	0	0	0	0	0
2	Non-homogenous Linear Differential equations with constant coefficients	10	23	0	1	0	1	1	0
	Unit - II								
3	Laplace Transforms	20	32	1	2	1	1	0	1
	Unit - III								
4	Fourier Series	13	26	1	1	0	0	1	1
	Unit - IV								
5	Probability	12	23	1			1/2	1/2	1
	Total	60	110	5	4	1	2 1/2	2 1/2	3
			Marks:	15	12	3	25	25	30

R: Remembering type 40 marks
U: Understanding type 37 marks
App: Application type 33 marks

Objectives

Upon completion of the subject the student shall be able to :

Unit-I

Differential Equations

1.0 Solve Homogeneous linear differential equations with constant coefficients in engineering situations

1.1 Solve Differential equations of the type $(aD^2 + bD + c)y = 0$ when the roots of the auxiliary equation are real and different, real and repeated, complex.

1.2 Solve the higher order homogeneous differential equations with constant coefficients.

2.0 Solve Non Homogeneous linear differential equations with constant coefficients in engineering situations

2.1 Explain the concept of complementary function, particular Integral and general solution of a differential equation.

2.2 Solve n^{th} order differential equation of the type $f(D)\ y = X$ where $f(D)$ is a polynomial of nth order and X is a function of the form $k, e^{ax}, Sinax, Cosax, x^n$.

Unit-II

3.0 Use Laplace Transforms to solve differential equation in engineering problems

3.1 Write the definition of Laplace Transform and Laplace transform of standard functions.

3.2 Explain the sufficient conditions of existence of Laplace Transform.

3.3 Write the properties of Laplace Transform – Linear property, First shifting property, Change of Scale.

3.4 Solve simple problems using the above properties

3.5 Write formulae for Laplace transform of $t^n f(t)$, $\frac{f(t)}{t}$, $f^{(n)}(t)$, $\int_0^t f(u)\,du$ interms of Laplace transform of $f(t)$.

3.6 Solve simple problems using the above formulae.

3.7 Define unit step function and write the Laplace Transform of unit step function.

3.8 Write second shifting property.

3.9 Define inverse Laplace Transform and write inverse Laplace Transform of standard functions.

3.10 Solve simple problems on 3.9

3.11 Write first shifting property of inverse Laplace Transfrom.

3.12 Solve simple problems on 3.11

3.13 Write inverse Laplace Transforms corresponding to Laplace Transform of the functions mentioned in section 3.5

3.14 Solve simple problems on 3.13.

3.15 Define convolution of two functions and state convolution theorem.

3.16 Solve simple problems on 3.15.

3.17 Use Laplace and inverse Laplace Transforms to solve simple differential equations of second order.

Unit-III

4.0 Know Fourier Series expansion of functions

4.1 Define the orthogonality of functions in an interval.

4.2 Define Fourier series of a function on the interval $(c, c+2\pi)$ and write the Euler's formulae for determining the Fourier coefficients.

4.3 Write sufficient conditions for the existence of Fourier series for a function.

4.4 Find Fourier series of simple functions in the range $(0, 2\pi)$, $(-\pi, \pi)$.

4.5 Write Fourier series for even and odd functions in the interval $(-\pi, \pi)$.

4.6 Write Fourier series expansion of a function over the interval $(-l, l)$

4.7 Write half range Fourier sine and cosine series of a function over the interval $(0, l)$

4.8 Solve simple problems on 4.5, 4.6 and 4.7

Unit-IV

5.0 Understand the basic concepts of Probability

5.1 Recall sets, operations on sets and Venn-diagrams.

5.2 Explain the terminology – random experiment, outcome, sample space, elementary event and event.

5.3 Define Probability – Empirical approach and axiomatic approach (Mathematical).

5.4 Prove addition theorem of probability for two mutually exclusive and exhaustive events.

5.5 State addition theorem of probability for three mutually exclusive and exhaustive events.

5.6 Solve simple problems on addition theorem.

5.7 Explain dependent, independent events and conditional event.

5.8 State the formula for conditional probability.

5.9 State multiplication theorem of probability.

5.10 State Bayes' theorem.

5.11 Solve simple problems on conditional probability and Bayes' theorem.

Course Content

Differential Equations

1. Homogenous linear differential equations with constant coefficients of order two and higher with emphasis on second order.
2. Non-homogenous linear differential equations with constant coefficients of the form f(D)y = X

where X is in the form k, e^{ax}, sin ax, cos ax, x^n, (n= 1,2) – complimentary function, particular integral and general solution.

Laplace Transforms(LT)

3. Definition, sufficient conditions for existence of LT, LT of elementary functions, linearity property, scale change property, first shifting property, multiplication by t^n, division by t, LT of derivatives and integrals, unit step function, LT of unit step function, second shifting theorem, inverse Laplace transforms- shifting theorems and change of scale property, multiplication by s^n and division by s – examples of inverse LT using partial fractions – convolution theorem (no proof) – applications of LT to solve ordinary differential equations with initial conditions (2^{nd} order only)

Fourier Series

4. Orthogonality of trigonometric functions, Representation of a function in Fourier series over the interval $(c\ ,\ c+2\pi)$, Euler's formulae , sufficient conditions for existence of Fourier series for a function, even, odd functions and their Fourier series over the interval $(0,\ 2\pi)$, Change of length of interval – Fourier series , half range series.

Probability

5 Review of sets, operations on sets and Venn-diagrams; random experiment, outcome, sample space, elementary event and event, equally likely events, Definition of Probability – Empirical approach and axiomatic approach (Mathematical), addition theorem of probability for two mutually exclusive and exhaustive events, extension of addition theorem for three mutually exclusive and exhaustive events, dependent, independent events and conditional event, probability of a conditional event, multiplication theorem, Bayes' theorem.

Reference Books :

1. Higher Engineering Mathematics, B.V.Ramana, Tata McGraw-Hill
2. Probability, 2/e Schaum's Outlines Series, McGraw-Hill
3. Elementary Probability and Statistics, by S.C.Gupta and V.K.Kapoor

OPERATING SYSTEMS

Subject Title : Operating Systems
Subject Code : CM– 402
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUEPRINT

S. No.	Major Topic	No. of Periods		Weightage of Marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
	UNIT I - Introduction to Operating System	**10**	**0**	**16**						
1	Operating System - Definition, History, various types	4	0		4	0	0	1	0	0
2	Concepts - Multiprogramming, Time Sharing, Distributed, Real-Time, Multiprocessor	3	0		4	0	0	1	0	0
3	Operating System Components, Services, System Calls, Single & Multi User	3	0		2	0	0	2	2	0
	UNIT II - Process Management	**20**	**0**	**39**						
1	Process, state diagram	6	0		3	1	0	1	1	0
2	Threads, Scheduling, Semaphores, Inter process communication	8	0		3	2		2	0	0
3	Deadlocks	6	0		2	0	0	2	0	0
	Storage management	**14**	**0**	**26**						
1	Memory management	4	0		0	4	0	0	1	0
2	Paging, Segmentation, Virtual memory, Demand paging	6	0		0	3	0	0	4	0
3	Page replacement - algorithms, Thrashing, Working Set Model, Page Fault Frequency	4	0		4	0	0	0	2	0
	Secondary storage management	**10**	**0**	**16**						
1	Disk Structure, Free space management	3	0		2	0	0	0	0	0
2	Allocation methods	3	0		1	0	0	1	0	0
3	Disk scheduling algorithms	4	0		0	0	0	1	0	0
	Files and Protection	**6**		**13**						
1	File management, File operations	1	0		2	0	0	0	0	0
2	Access methods	3	0		0	0	0	1	0	0
3	Directory Structure, File Protection	2	0		1	0	0	1	0	0
	TOTAL	60	0	110	10			8		

OBJECTIVES

On completion of the study of the course the student shall be able to

1 Know about basics of operating systems.

1.1 Define an operating system.
1.2 Discuss history of operating system.
1.3 Discus about various operating systems.
1.4 Distinguish spooling and buffering.
1.5 Explain the concepts like multiprogramming and timesharing.
1.6 Differentiate between distributed and real time systems.
1.7 Describe multiprocessor systems.
1.8 Understand the operating system components.
1.9 Discuss operating system services.
1.10 Define system call with an example.
1.11 List different types of system calls.
1.12 Define single, multi user operating system structure.

2 Understand process management.

2.1 Define processes.
2.2 Understand a) sequential process b) process state diagram c) process control block.
2.3 Describe process creation and termination.
2.4 Understand the relation between processes.
2.5 Describe threads and multithreading.
2.6 Explain scheduling concepts.
2.7 Describe scheduling queues and schedulers.
2.8 Explain C.P.U. scheduling and scheduling criteria.
2.9 Explain various scheduling algorithms – FIFO, SJF, Round Robin, Time sharing, Multilevel scheduling, Multilevel feedback Queue scheduling.
2.10 Describe semaphores.
2.11 Explain inter process communication.
2.12 Define a deadlock.
2.13 State the necessary conditions for arising deadlocks.
2.14 State various techniques for deadlock prevention.
2.15 Discuss briefly deadlock avoidance and detection.
2.16 Describe the process of recovering from deadlock.

3 Understand the storage management.

3.1 Describe briefly address binding, dynamic loading, dynamic linking overlays.
3.2 Describe briefly on swapping.
3.3 Explain single partition allocation.
3.4 Explain multiple partition allocation.
3.5 Explain paging concept.
3.6 Explain briefly segmentation.
3.7 Define virtual memory techniques.
3.8 Describe briefly demand paging.
3.9 Describe page replacement.
3.10 Discuss briefly on page replacement algorithms - FIFO, LRU, optimal.
3.11 Define concept of thrashing.
3.12 Explain working set model and page fault frequency.

4.0 Understand the secondary storage management.

4.1 Explain disk structure.
4.2 Understand free space management.
4.3 Describe various allocation methods.
4.4 Explain various disk scheduling algorithms- FCFS, SST, Scan, C-Scan, Look.

5.0 Understand file system and protection.

5.1 Define file management.
5.2 List and explain various file operations.
5.3 List and explain various access methods.
5.4 Explain directory structure organization.
5.5 Describe the concept of file protection.

COURSE CONTENTS

1. Introduction to operating system

Introduction – History of operating system – Operating system concepts – Operating system structure – Overview of operating system functions- types system calls- single and multi user operating system structure.

2. Processor management

Introduction to processor – Job programs – Job scheduling – Process scheduling – Process synchronization – Process communications – Deadlocks.

3. Storage management

Memory management – Paging – Swapping – Virtual memory – Page replacement algorithms – working set model – page fault frequency.

4. Secondary storage management

Disk structure – Free space management – Allocation methods – Scheduling methods – Hierarchy.

5.File systems

Introduction to file systems – File system design – File servers – Security – Protection mechanism.

REFERENCE BOOKS

1. Operating Systems -- Silberschatz and Galvin
2. Operating Systems -- Dietel and Dietel
3. Operating Systems -- Dhamdhere (TMH)
4. Advanced Operating Systems -- Tanenbaum

COMPUTER HARDWARE & MAINTANENCE

Subject Title : Computer Hardware & Maintenance
Subject Code : CM- 403
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUEPRINT

SNO	Major topics	No of periods		Weigh tage of marks	Short type			Essay type		
	Unit-I PC hardware and its Components.	The ory	Pract ice	16	R	U	Ap p.	R	U	App
1	Hardware	2	2		2	0	0	1	0	0
2	Software	2	2		0	1	0	0	0	0
3	BIOS	1	1		0	2	0	0	0	0
4	Various parts on Mother board	5	4		1	0	0	1	0	0
	Unit –II Installation of PC Hardware and Mass storage devices			39						
5	Mother board	7	5		0	2	0	0	0	2
6	Processor	7	5		1	0	0	2	0	0
7	Memories	6	4		0	2	0	0	2	0
	Unit-III Study of Input and Output Devices			16						
8	Input devices	5	4		2	0	0	1	0	0
9	Output devices	5	3		2	0	0	1	0	0
	Unit –IV Installation of PC Software			23						
10	Partition of Hard disk	2	2		0	2	0	0	0	0
11	Formatting of Hard Disk	2	2		1	0	0	0	1	0
12	Installation of Operating System software	5	5		0	0	0	0	0	1
13	Installation of Application software	3	2		0	0	0	0	1	0
	Unit –V Troubleshooting the computer faults			16						
14	Trouble shooting equipment	2	1		2	0	0	0	0	0
15	Keyboard Trouble shooting	3	3		0	2	0	1	0	0
16	Monitor Trouble shooting	3	3		0	0	0	1	0	0
	TOTAL	**60**	**50**	**110**	**10**			**8**		

OBJECTIVES

On completion of the study of the course the student shall be able to

1.0 Understand PC hardware and its Components.

1.1 Explain PC Hardware and software

1.2 State the importance of BIOS

1.3 Describe the BIOS hardware interaction

1.4 Explain the BIOS functions of (I) POST, (ii) Bootstrap loading

1.5 State the configuration of a general purpose computer (P-IV Compatible) .

1.6 Identify the mother board, processor, chipset, SMPS, Disk Drives, RAM,PCI,IDE,ISA slots, mouse ,AGP ,,Keyboard, monitor, printer, speaker, USB ports, Parallel port, Serial Port, and Modem of the system.

1.7 Identify atleast various cables that connect peripherals to the rear side of system

2.0 Installation of PC Hardware and Mass storage devices

2.1 Mother Board

2.1.1 Explain various motherboards based on the form factor : such as AT,ATX, micro ATX,mini ATX , Baby AT,BTX,NLX etc

2.1.2 List various components on the motherboard .

2.1.3. List the I/O ports available on motherboard

2.2 Processors

2.2.1 Describe various processors used in the system : INTEL P4, Celeron, XEON, Itanium processors, AMD athlon .

2.2.2 Define chipset ? write the components of INTEL chipset 915,945,965, AMD

2.2.3 state the different processor sockets Like ZIF,SEC and PGA.

2.2.4 Distinguish Different processors Like P-IV,P-IV with HT Technology ,Dual core,Core 2 Duo ,Quad core and i-series (i3,i5 and i7).

2.2.5 List the features of above chipset and their advantages

2.2.6 State the importance of SMPS over linear voltage power supply

2.2.7 use connectors from SMPS and list the voltage levels of each wire in various connectors based on the standard color of the wire

2.3 Memories

2.3.1 Define the static and dynamic RAM.

2.3.2 Identify RAM slots such as SIMM, DIMM, RIMM and mention their specification

2.3.3 Distinguish RAM types SDRAM, DDR(1-3), Rambus RAM

2.3.4 Define Cache memory and how it improves the performance of memory.

2.3.5 Define L1 and L2 cache and their locations .

2.3.6 Explain the Procedure of Assembling and De Assembling of a PC
2.3.7 Explain the installation of motherboard
2.3.8 Explain the Configuration and installation of processor ,RAM, HDD, CDROM / DVD, keyboard, mouse, monitor, and printer.

2.3.9 Explain procedure to upgrade RAM capacity of the system by adding additional RAMs

2.4 Mass storage devices

2.4.1 Give the constructional details and working of a Hard disk Drive

2.4.2 Explain the importance of jumper settings and give details of it

2.4.3 Familiarize with hard disk interfacings standards like IDE/SCSI /SATA / PATA

2.4.4 Give the constructional details of a CD- ROM

2.4.5 Explain the process of reading and writing of data on various disk drives like CD-ROM,CD- Writer, Combo drive , DVD Drive etc.

2.4.6 Explain the working of a Pen drive

2.4.7 Give the specifications of all above storage devices

3.0 Study of Input and Output Devices

Input Devices

3.1 List the various input devices used with a general purpose computer

3.2 the installation of Keyboard

3.3 Discus the principle of working of an optical and opto mechanical mouse

3.4 Explain the working of flat bed scanner

3.5 Explain the working of a Webcam

3.6 List the important specifications of keyboard, mouse, scanner, webcam.

Output Devices

3.7 Describe the working principle of CRT Monitor

3.8 Describe the working principle of LCD/TFT .

3.9 Describe Different categories of printers(Impact and Non-Impact)

3.10 Describe the working principle of Dot matrix printer

3.11 Describe the working principle of inkjet printer

3.12 Describe the working principle of Laser printer

4.0 Installation of PC Software

4.1 Explain how to run Windows Setup

4.2 Define Partitioning . Explain how to perform partitions of hard disk

4.3 Define Formatting and its types. Explain formatting a hard disk FAT/NTFS Format

4.4 Explain how to create a DOS boot disk

4.5 Explain the installation of OS software such as Windows XP / Windows7

4.6 Explain the installation of Application software such as MS Office 2007 / Office 2010

5.0 Troubleshooting the computer faults

5.1 Familiarize with various troubleshooting and measuring equipment such as

multimeter, CRO,Logic probe, Logic Analyzer

5.2 Know the precautions to be taken while troubleshooting the hardware

5.3 Explain the systematic steps in troubleshooting: Visual inspection, Layman checks, measurement of voltage levels, Beep sounds, Error codes and Use of Advanced Diagnostic tools

5.4 Describe various recovery tools for data recovery from Hard disk.

5.5 Describe troubleshooting procedure of “no display on monitor”

5.6 Describe troubleshooting procedure of “core dump”

5.7 Describe troubleshooting procedure of “keyboard error”

5.8 Describe troubleshooting procedure of “monitor is rolling”

5.9 Describe troubleshooting procedure of “no signal on monitor”

COURSE CONTENTS

1. PC hardware and its Components.

Hardware and software- the BIOS hardware interaction , importance of BIOS, BIOS functions configuration of a general purpose computer (P-IV Compatible) ,identification of various components on the motherboard.

2. Installation of PC Hardware

Mother Board- motherboards based on the form factor : such as AT,ATX, micro

ATX,mini ATX , Baby AT,BTX,NLX ,various I/O ports available on the motherboard

Processors- various processors used in the system : INTEL P4, Celeron, XEON,Itanium processors, AMD athelon, chipset,components of INTEL chipset 915,945,965, AMD , processor sockets Like ZIF,SEC and PGA, processors Like P-IV,P-IV with HT Technology ,Dual core, Core 2 Duo ,Quad core and i-series (i3,i5 and i7), features of above chipset and their advantages ,importance of SMPS over linear voltage power supply, connectors from SMPS and list the voltage levels of each wire in various connectors based on the standard color of the wire

RAM- static and dynamic RAM, RAM slots such as SIMM, DIMM, RIMM and their specification

Mass storage devices - Hard disk Drive, jumper settings , hard disk interfacings standards like IDE/SCSI /SATA / PATA, various disk drives CD-ROM,CD- Writer, Combo drive , DVD Drive , Pen drive.

3.0 Study of Input and Output Devices

Input Devices- various input devices used with a general purpose computer, installation of Keyboard, optical and opto mechanical mouse , flat bed scanner, Webcam,

Output Devices- working principle of CRT Monitor ,working principle of LCD/TFT,printers(Impact and Non-Impact) working principle of Dot matrix printer, inkjet printer, Laser printer

4.0 Installation of PC Software

Windows Setup, Partitioning of hard disk , Formatting and its types FAT/NTFS ,create a DOS boot disk , installation of OS software such as Windows XP / Windows7, installation of Application software such as MS Office 2007 / Office 2010

5.0 Troubleshooting the computer faults

Familiarize with various troubleshooting and measuring equipment such as -multimeter, CRO,Logic probe, Logic Analyzer, precautions to be taken while troubleshooting the hardware, systematic steps in troubleshooting: Visual inspection, Layman checks, measurement of voltage levels, Beep sounds, Error codes and Use of Advanced Diagnostic tools, various recovery tools for data recovery from Hard disk,no display on monitor, core dump, keyboard error , flickering on the monitor.

REFERENCE BOOKS

1. Enhanced Guide to Managing -- Jean Andrews (Thomson)
   And Maintaining Your PC
2. Basics of Networking -- NIIT PHI publications
3. PC Hardware A Beginners Guide -- Gilster (TMH)
4. PC Upgrading -- Stephen Bigelow (TMH)
5. Trouble Shooting Your PC -- Stone & poor
6. Computer Networks -- Andrew S. Tanenbaum

MICROPROCESSORS

Subject Title : Microprocessors
Subject Code : CM– 404
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE & BLUEPRINT

S.No	Major Topic	No. of Periods		Weightage of Marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
	Unit - 1 : Introduction & Architecture			11						
1	Introduction	1	0		1	0	0	0	0	0
2	8086 Architecture	4	0		0	1	0	0	1/2	0
3	8086 Pins	3	0		0	1	0	0	1/2	0
4	Bus cycles and timing	2	0		1	0	0	0	1/2	0
	Unit - 2 : Instruction set of 8086			26						
5	Instruction format	1	0		1	0	0	0	1	0
6	Addressing modes	3	0		0	1	0	0	1	0
7	Instructions	9	0		0	0	1	0	0	1
8	Assembler directives	1	0		0	1	0	0	1	0
9	Assembly language development tools	1	3		0	1	0	0	1	0
	Unit - 3 : Interrupts and Assembly language programming			34						
10	Classification of Interrupts	1	0		1	0	0	0	1/2	0
11	Interrupts of 8086	1	0		1	0	0	0	1/2	0
12	Programmable Interrupt controller	2	0		1	0	0	0	1	0
13	Assembly language programming	6	10		0	1	0	0	0	1
14	Examples	10	28		0	1	0	0	0	1
	Unit - 4 : Peripheral devices and Interfacing			26						
15	Parallel data transfer schemes	2	0		1	0	0	0	0	0
16	Programmable peripheral interface (8255)	2	1		1	0	0	0	1	0
17	DMA controller (8257)	2	1		1	0	0	0	1	0
18	USART (8251)	2	1		1	0	0	0	1	0
19	Keyboard and Display controller (8279)	2	1		1	0	0	0	1	0
	Unit - 5 : Intel advanced processors			13						
20	Comparison of 80286, 80386 and 80486	1	0		1	0	0	1	0	0
21	Pentium Microprocessor	1	0		1	0	0	0	1	0
22	Architecture of Pentium Processor	2	0		0	1	0	0	1	0
23	Comparison of advanced Pentium Processors	1	0		1	0	0	1	0	0
	TOTAL	60	45	110	10			08		

OBJECTIVES

On completion of the study of the course the student shall be able to :

1.0 Explain the architecture of 8086 microprocessor.

- 1.1 Define Micro computer and Microprocessor.
- 1.2 Describe how a micro computer fetches and executes an Instruction.
- 1.3 Explain 8086 internal architecture.
- 1.4 List registers and other parts in 8086.
- 1.5 Describe the function of each block in 8086.
- 1.6 Demonstrate how 8086 calculates memory addresses.
- 1.7 Describe the Pins and signals of 8086.
- 1.8 Illustrate the bus cycles and timing diagram of 8086.

2.0 **Understand the instruction set of 8086**

- 2.1 Draw the generalized Instruction format of 8086.
- 2.2 Explain addressing modes of 8086 with examples.
- 2.3 Classify the Instruction set of 8086.
- 2.4 Use data transfer instructions of 8086.
- 2.5 Use Arithmetic instructions of 8086.
- 2.6 Use Logic instructions of 8086.
- 2.7 Use processor control instructions of 8086.
- 2.8 Use instructions affecting flags of 8086.
- 2.9 Use control transfer (branching) instructions of 8086.
- 2.10 Use string manipulation instructions of 8086.
- 2.11 Describe assembler directives.
- 2.12 Describe the use of various assembly language development tools like Editor, Assembler, Linker, Locator and Debugger.

3.0 Understand Interrupts and write assembly language programs

- 3.1 Define interrupt.
- 3.2 State the need of interrupt.
- 3.3 Classify the interrupts.
- 3.4 Understand the Interrupts of 8086.
- 3.5 Explain the interrupt handling process in 8086.
- 3.6 Explain programmable interrupt controller 8259.
- 3.7 Understand the significance of assembly language Programming.
- 3.8 Describe the procedure for executing an assembly language program with assembler.
- 3.9 Explain conditional and loop statements.
- 3.10 Write simple assembly language programs using conditional and loop statements.
- 3.11 Explain procedural programming in 8086.
- 3.12 Illustrate CALL, RETURN statements and parameter passing.
- 3.13 Write simple program using procedure and parameters passing.

4.0 Explain various peripheral devices and their interfacing with 8086

- 4.1 Define peripheral.
- 4.2 State the principles of interfacing with peripherals.
- 4.3 Explain parallel data communication interfacing.

4.3.1 Understand various parallel data transfer schemes.
4.3.2 Illustrate programmable peripheral interface – INTEL 8255.
4.3.3 Explain the function of 8255.
4.3.4 Explain the process of interfacing 8255 with 8086.
4.3.5 Describe DMA data transfer scheme.
4.3.6 Illustrate DMA controller – INTEL 8257.
4.3.7 Explain the function of 8257.
4.3.8 Explain the process of interfacing 8257with 8086.

4.4 Explain serial data communication interface.
4.4.1 Understand serial data communication.
4.4.2 Illustrate USART – INTEL 8251A.
4.4.3 Explain the function of 8251A.
4.4.4 Explain the process of interfacing 8251A with 8086.

4.5 Explain keyboard and display interface.
4.5.1 Understand keyboard interface using ports.
4.5.2 Understand display interface using ports.
4.5.3 Illustrate Keyboard/Display controller – INTEL 8279.
4.5.4 Explain the function of 8279.
4.5.5 Explain the process of interfacing 8279with 8086

5.0 Compare various Intel advanced processors

5.1 Compare/Contrast the features of 80286, 80386, 80486 processors.
5.2 Explain 8086 architecture of Pentium microprocessor.
5.3 Compare/Contrast the features of advanced Pentium processors.

COURSE CONTENT

1.0 INTRODUCTION AND ARCHITECTURE

Define Micro computer, Microprocessor - how a micro computer fetches and executes an instruction - 8086 internal architecture – functions of 8086 queue - how 8086 calculates memory addresses - Pins and signals of INTEL 8086 - Bus cycles and timing diagram

2.0 INSTRUCTION SET OF 8086

Introduction - Instruction format - Addressing modes of 8086 - Instruction execution time - Instruction affecting flags - Data transfer instructions - Arithmetic instructions - Logical instructions - String manipulation instructions - Understand the control transfer (branching) instructions of 8086 - String manipulation instructions – assembler directives - various assembly language development tools.

3.0 INTERRUPTS AND ASSEMBLY LANGUAGE PROGRAMMING

Interrupts and its classification – Interrupts of 8086 – programmable Interrupt controller 8259 - Assembly language programming - executing assembly language program with assembler - examples on conditional and loop statements - Illustrating procedure CALL and RETURN, parameter passing and procedure passing.

4.0 PERIPHERAL DEVICES AND INTERFACING

Introduction to peripherals and interface - Parallel data transfer schemes - Programmable peripheral interface – INTEL 8255 - DMA data transfer scheme - DMA controller – INTEL 8257 - Serial data communication - USART – INTEL 8251 A –Keyboard and Display controller – INTEL 8279

5.0 INTEL ADVANCED PROCESSORS

Introduction - Comparison of 80286, 80386 and 80486 processors - Pentium Microprocessor - Architecture of Pentium Processor - Comparison of advanced Pentium processors.

REFERENCE BOOKS

1. Microprocessors & Interfacing -- Douglas V.Hall
2. X86 microprocessor programming -- Venugopal and Rajkumar, TMH
3. Advanced Microprocessors and Peripherals -- A K RAY, K M Bhurchandi, TMH

OOPS THROUGH C++

Subject Title : OOPS through C++
Subject Code : CM- 405
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUEPRINT

S. No.	Major Topic	No. of Periods		Weightage of Marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
	UNIT I - OOPS Methodology, Introduction to C++	**18**	**30**	**42**						
1	OOPs Principles, Differences between C & C++, Structure of C++ program, I/O operation	6	6		3	1	0	1	0	0
2	Comments, Keywords, Class, Object, Constructor, Destructor, Friend function.	6	15		5	2	0	2	0	3
3	Inline functions, passing objects to functions, returning objects from functions, overloading.	6	9		2	0	0	0	0	6
	UNIT II - Arrays, Pointers, References	**10**	**12**	**13**						
1	Array of objects, pointers to objects	5	6		0	0	0	0	0	2
2	this', 'new', 'delete', references	5	6		4	0	0	0	0	3
	UNIT III - Classes and Inheritance	**14**	**30**	**29**						
1	Inheritance, base class and derived class, access controls	4	6		3	0	0	1	0	0
2	Types of inheritance, virtual function	10	24		3	0	0	0	0	5
	UNIT IV - C++ I/O	**10**	**9**	**13**						
1	C++ I/O	5	5		2	0	0	3	0	0
2	File I/O	5	4		3	0	0	3	0	0
	UNIT V - Templates	**8**	**9**	**13**						
1	Templates, Function templates	4	4		2	0	0	0	0	2
2	Class templates	4	5		1	0	0	0	0	2
	TOTAL	60	90	110	10			8		

OBJECTIVES

On completion of the study of the course the student shall be able to:

1. Understand the concept of OOP methodology.

1.1 Appreciate the evolution of OOP's.
1.2 State the **principle** of **object oriented language.**

1.3 Explain OOP's properties like **encapsulation, polymorphism.**
1.4 Create, compile, link and execute a C++ program.
1.5 Differentiate **C, C++.**
1.6 Write the structure of C++ program.
1.7 Explain C++ **I/O operation** with examples.
1.8 Write **comment statements** in C++.
1.9 List out **keywords** of C++ other than C.
1.10 Define a **class** & **object** of C++.
1.11 Define and use **constructor** and **destructor.**
1.12 Declare, define, and use **class.**
1.13 Explain **friend function** and its use.
1.14 Compare classes with structures.
1.15 Declare **inline function** and write its advantages.
1.16 Create **objects.**
1.17 Explain the concept of passing objects to functions.
1.18 Explain the concept of returning objects from functions.
1.19 Write small programs using the above concepts.
1.20 Explain the concept of **operator overloading** with some examples.
1.21 Explain the concept of **function overloading.**

2.0 Understand arrays, pointers and references

2.1 Declare and access **array of objects.**
2.2 Illustrate the above with small programs.
2.3 Declare, access **pointers to objects.**
2.4 Illustrate the above with small programs.
2.5 Use of **'this'** operator.
2.6 Explain the operation of dynamic memory allocation using **new** and **delete** operators.
2.7 Declare and use **references.**

3.0 Understand derived classes and inheritance

3.1 State the necessity for **inheritance.**
3.2 Explain the relation between **base class** and **derived class.**
3.3 Write the format / syntax for defining a derived class
3.4 Explain the three types of access control – **public, private** & **protected.**
3.5 Explain **types of inheritance** with examples and virtual base class.
3.6 Write small programs to illustrate the above concepts.
3.7 Explain concept of **virtual functions** and its applications.

4.0 Understand the C++ I/O

4.1 List the **C++ I/O operators** with their meaning.
4.2 Write the basics of **formatted I/O.**
4.3 Explain **I/O manipulators** and give at least five examples.
4.4 Explain file I/O and classes of stream.h.

4.5 Explain the binary I/O functions like **get( )** and **put( ).**

4.6 Write the format and working of file I/O functions like **open( ), read( ), write( ), count( )** etc..

5.0 Know Templates

5.1 Explain the need for **Templates.**

5.2 List the types of Templates.

5.3 **Function Templates**

5.3.1 Templates with Single Argument Types.

5.3.2 Creating function based Templates.

5.3.3 Templates with multiple argument types.

5.4 **Class Templates**

5.4.1 Syntax.

5.4.2 Creating Classes based on Template.

5.4.3 Class Template for Stack Data Structure.

COURSE CONTENTS

1. **OOP methodology :** Principle, properties, portability and standards. **Structure of C++ programs.** I/O Operations, statements, keywords. Class/object functions, classes & structures, constructor and destructors, friend function, inline functions, passing objects to functions – pass by value and pass by reference, returning objects from functions, operator overloading, virtual function, function overloading.

2. **Arrays, pointers and References:** Using Arrays, array of objects, pointers to objects, this operator, dynamic memory allocations, references.

3. **Derived classes and inheritance:** Base Class and derived class, access control, types of inheritance, virtual base class, virtual functions.

4. **C++ I/O operations :** C++ I/O operators, formatted I/O, I/O manipulators, file I/O, binary I/O functions, file I/O functions.

5. **Templates :** Need for Templates – classification of templates, function templates – single argument and multiple argument, class templates.

REFERENCE BOOKS

1. Teach your self C++ - Helbert schildt Osborne McG
2. Object-oriented Programming with C++ - Poornachandra Sarang PHI
3. Programming with C++ - E. Balaguruswamy – TMH
4. Computer Science: A Structured Approach using C++ --Forouzan/Gillberg - Thomson
5. C++ & OOPS Paradigm - Debasish Jana PHI

COMPUTER NETWORKS

Subject Title : Computer Networks
Subject Code : CM-406
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE & BLUE PRINT

S.No	Major topic	No.of Periods		Weightage of marks	Short type			Essay type		
		Theory	Practice		R	U	A	R	U	A
	Unit-I Introduction to Networks and Topologies									
1	Understand the overview of networking	1		3		1				
2	Need of Networking	1				1				
3	Hardware and Software Components	1			1					
4	Explain how computers can be connected	1		10			1			
5	Communication Standards - OSI Model, TCP/IP Model	4							2	
6	Network Topologies - Overiew	1		3	1					
7	Understand bus, ring, star, mesh, hybrid technologies	1				5				
	Unit-II LAN Components and Protocols									
8	Cables and Connectors	1		9	2	1				
9	Devices - Repeaters, Hubs, Switches, NICs	2				4				
10	Wireless LANs	2			1				1	
11	Know about Protocols	1			1					
12	Lower-Layer Protocols	4		20					1	
13	Middle-Layer Protocols	2							1	
14	Higher-Layer Protocols	3							1	
	Unit-III Network Addressing									
15	Introduction to Network Addressing	2		3		1				
16	Understand the TCP/IP Addressing Scheme	6		15	1	1			1	1
17	IPX/SPX Addressing	1		5	1				1	
18	NETBUI Addressing	1			1				1	

	Unit-IV WAN hardware and Protocols									
19	WAN connectivity options	4		3	1				1	
20	Virtual Private Networks	3		6	1	1			1	
21	WAN Devices	4		8	1	1			1	
22	WAN Protocols	4		9	1	1			1	
	Unit-V Network Management									
23	Network Management	3		3	1	2				
24	Monitoring and Troubleshooting	4		5	1	2			1	
25	Remote Monitoring	1		5	1	2			1	
26	Ethernet, Network Security	2		3	1	1				
	Total	60		110	17	24	1	0	15	1

OBJECTIVES:

On completion of the study of the subject, the student should be able to comprehend the following

1.0 Understand the concepts of Networks and Topologies.

1.1 Understand the basics of Networking.
1.2 State the Need for Networking.

1.3 List the Hardware and Software Components.

1.4 Explain how two computers can be connected using Direct Cable Connection (DCC).

1.5 understand Various Network Communication Standards.

1.5.1 OSI Reference Model.

1.5.2 TCP/IP Reference Model.

1.6 understand Overview of Network Topologies.
1.7 Understand the basic Topologies such as Bus, Ring and Star, Complex topologies like Mesh and Hybrid Topologies.

2.0 LAN Components and Protocols.

2.1 Know and describe the LAN Cables and Connectors.
2.2.1 Coaxial Cables,

2.2.2 Twisted-Pair Cables,

2.2.3 Optical Fiber Cables,

2.2.4 Connectors.

2.3 Explain LAN Devices

2.3.1 Repeaters

2.3.2 Hubs

2.3.3 Switches

2.3.4 Network Interface Cards (NICs)

2.4 Describe about Wireless LANs (WLANs)

2.5 Explain Lower-Layer Protocols.

2.5.1 ARCnet

2.5.2 IEEE Standard 802.3 & Ethernet

2.5.3 IEEE Standard 802.4 -Token Bus

2.5.4 IEEE Standard 802.5 – Token Ring.

2.5.5 Fiber Distributed Data Interface (FDDI)

2.6 Explain about Middle-Layer Protocols

2.6.1 TCP/IP

2.6.2 Internetwork Packet Exchange/Sequenced Packet Exchange

2.6.3 NetBios Enhanced User Interface (NETBEUI) (IPX/SPX)

2.7 Explain about Higher-Layer Protocols.

2.7.1 Hyper Text Transfer Protocol (HTTP)

2.7.2 File Transfer Protocol (FTP)

2.7.3 Simple Mail Transfer Protocol (SMTP)

2.7.4 Telnet

3.0 Understand the following Network Addressing techniques

3.1 Basics of Network Addressing.

3.2 TCP/IP Addressing Scheme.

3.2.1 Components of IP Address.

3.2.2 IP Address Classes.

3.2.3 IP Subnetting

3.2.4 Variable Length Subnet mask (VLSM)

3.2.5 Classless Inter Domain Routing (CIDR)

3.2.6 Internet Protocol Version 6 (IPv6)

3.3 IPX/SPX Addressing

3.4 NETBEUI Addressing

4.0 Understand about WAN hardware and WAN Protocols.

4.1 Overview of WAN.

4.2 List and explain the various WAN Connectivity Options.

4.2.1 POTS

4.2.2 Leased Lines

4.2.3 Integrated Services Digital Network (ISDN)

4.2.4 Very Small Aperture Terminal (VSAT)

4.2.5 Microwave

4.2.6 Radio

4.2.7 Infrared

4.3 Understand Virtual Private Networks (VPNs).

4.3.1 Working of VPN

4.3.2 VPN Protocols

4.4 List and Explain the working of the following WAN Devices

4.4.1 Bridges

4.4.2 Routers

4.4.3 Gateways

4.5 List and Explain the various WAN Protocols.

4.5.1 Point-to-Point Protocol (PPP)

4.5.2 X.25

4.5.3 Frame Relay

4.5.4 Asynchronous Transfer Mode (ATM)

4.5.5 Local Area Network Emulation (LANE)

5.0 Understand Networking Management, Monitoring and Troubleshooting

5.1 Explain Network Management.

5.2 Understand the Overview of Network Management.

5.3 Understand the Model of ISO Network Management

5.4 Understand the Network Monitoring and Troubleshooting.

5.5 Learn about Simple Network Management Protocol (SNMP).

5.6 Explain how SNMP works.

5.7 Know about Remote Monitoring (RMON).

5.8 Know about Ethernet.

5.9 Network Security

COURSE CONTENTS

1. **Introduction to Networks –** Need of Networking – Components – Communication Standards – OSI Model – TCP/IP Model – Network Topologies.

2. **LAN Components –** Cables and Connectors – Devices – Wireless LANs – Protocols – Lower-Layer – Middle-Layer – Higher-Layer.

3. **Network Addressing –** TCP/IP Addressing scheme – IPX/SPX Addressing scheme – NETBEUI Addressing.

4. **WAN: Hardware and Protocols –** Virtual Private Networks – WAN Devices – WAN Protocols.

5. **Network Management –** Overview – Monitoring and Troubleshooting – Remote Monitoring – Ethernet.

REFERENCE BOOKS

1. Computer Communications and Network Technologies -Michael A. Gallo -William M. Hancock, Thomson
2. Computer Networks, 4th Edition -Tannenbaum
3. Networking Essentials with Projects -Palmer, Thomson
4. Basics of Networking -- NIIT, PHI Publications

COMPUTER HARDWARE & NETWORKING LAB PRACTICE

Subject Title : **Computer Hardware & Networking Lab**
Subject Code : **CM – 407**
Periods per Week : **06**
Periods per Semester : **90**

LIST OF EXPERIMENTS

1. Identify motherboard components
2. RAM identification, removal, installation.
3 Assembling and Disassembling of a PC
4. Upgradation of PC.
5. CMOS setup.
6 Practice on Partition and formatting of Hard disk
7 Installation of operating system software (Windows xp / Windows7)
8 Installation of device driver software
9 Installation of application software (MS-Office 2007/ 2010)
10. Print a summary of your system Hardware.
11 How to recover lost data on hard drive.
12 Trouble shooting keyboard, monitor, printer
13 Installation of Network card and its driver software
14 Preparing the UTP cable for cross and straight connections using crimping tool.
15 Installation of a switch and connecting systems to a network Hub / switch.
16 Practice on Network Addressing classes (class A, B, C)
17 IP Address components
18 Installation of a modem (internal, external or USB) and connecting to internet.
19 Using FTP for uploading and downloading files.
20 Installation and configuring the proxy server for internet access.
21 Implementation of peer to peer network
22 Implementation of workgroup network
23 Implementation of Wi-Fi Network

OBJECTIVES AND KEY COMPETENCIES:

Exp.No	Name of the Experiment	Objectives	Key Competencies
1	Identify motherboard components	Identify various components on the motherboard	Identify a)Processor b)HDD c)CMOS d)PCI e)IDE f)AGP g)ISA h)NIC etc
2	RAM identification, removal, installation	Perform RAM installation, removal and identification	a)Install RAM b)Remove RAM

3	Assembling and Disassembling of a PC	Perform Assembling and Disassembling of PC	a)Assemble PC b)Disassemble PC
4	Upgradation of PC	Perform upgradation of PC	Replace the following a)RAM b)HDD
5	CMOS setup.	Perform CMOS setup for required changes	Run CMOS setup
6	Practice on Partition and formatting of Hard disk	Practice partitioning and formatting of HDD	Practice the following a)partition b)formatting
7	Installation of operating system software (Windows XP / Windows7)	Practice installation of OS	Practice the following a)Windows XP or b)Windows 7
8	Installation of device driver software	Perform installation of required device driver software's	Install a)NIC b)chipset c)Audio / video and other required
9	Installation of application software (MS-Office 2007/ 2010)	Installation of application software	Install a)MS-Office 2007 / MS-Office 2010
10	Print a summary of your system Hardware.	Perform the procedure to print summary of your PC	Display summary of your PC
11	How to recover lost data on hard drive.	List the steps for recovery of lost data from the hard disk	Recover the lost data a) using a working HD b) using third party tools
12	Troubleshooting keyboard, monitor, printer	Perform the trouble shooting of keyboard, monitor and printer	Trouble shoot the following a)keyboard b)monitor c)printer
13	Installation of Network card and its driver software	Installation of network card and its driver software	Install the following a)NIC b)driver software
14	Preparing the UTP cable for cross and straight connections using crimping tool.	Perform UTP cable preparation for cross and straight	Prepare the following a)cross cable b)straight cable
15	Installation of a switch and connecting systems to a network Hub / switch	Installation of switch and connecting systems	Install a)switch b)Connecting to systems
16	Practice on Network Addressing classes (class	Perform network addressing classes	Practice the following network addressing

	A,B,C)		classes a)class A b)class B c)class C
17	IP Address components	Know IP address components	Practice IP address components
18	Installation of a modem (internal, external or USB) and connecting to internet.	Installation of Modem and connecting to internet	Install a)Modem and connecting to internet
19	Using FTP for uploading and downloading files.	Perform uploading and downloading of files	Practice the following a)uploading b)downloading of files
20	Installation and configuring the proxy server for internet access.	Perform the configuration of proxy server	Prepare proxy server and connect to internet
21	Implementation of peer to peer network	Perform peer to peer network	Prepare peer to peer network
22	Implementation of workgroup network	Perform workgroup network	Prepare workgroup network
23	Implementation of Wi-Fi Network	Perform Wi-Fi network	Prepare Wi-Fi network

COMMUNICATION SKILLS LAB PRACTICE
(Common to all Branches)

Subject title : Communication skills
Subject code : CM-408
Periods per week : 3
Periods per semester : 45

Introduction :

In the context of globalization , competence in speaking skills is the need of the hour The gap between the needs of the industry and the curriculum can be bridged by enabling the students to hone their speaking and listening skills. This course aims at providing opportunities for practicing speaking.

Time Schedule

Sno.	Topic	Periods	Weightage of marks (End Exam)	Sessional marks	Total
1	Listening I	3	10	10	20
2	Listening II	3			
3	Introducing oneself	3	50	30	80
4	Describing objects	3			
5	Describing events	3			
6	Reporting past incidents	3			
7	Speaking from observation / reading	3			
8	JAM	6			
9	Group discussion	6			
10	Mock interviews	6			
11	Making presentations	6			
		45	60	40	100

Objectives :

On completion of the course the students will be able to

- Strengthen their listening skills
- Strengthen their speaking skills

Competencies and key competencies to be achieved by the student

Topic	Teacher's input/ methodology	Students competence
Listening I Listening II	Pre- Listening –eliciting, pictures While - Listening Post –Listening –project , writing	Identifying the main idea, Identifying specific details, Identifying parallel and contradictory ideas Drawing inferences, Reasoning
Introducing oneself	Kinds of introduction --official/ personal, dynamic vocabulary, Body language, Model introduction, Use of line ups	Use of simple present tense, Sequencing, Appropriate vocabulary
Reporting incidents	Group work /pair work, Elicit, Use of past tense, Student presentations	Use of past tense, Relevant vocabulary
Describing objects	Vocabulary , Use of adjectives, Games—I spy, Group presentations	Use of adjectives, Dimensions,shapes Compare and contrast, sequence
Describing events	Group work/pair work Use of appropriate tense	Use of appropriate tense, sequencing
Reporting past incidents	Use of past tense, Vocabulary Student presentations	Use of past tense , sequencing
Speaking from observation/reading	Group work/pair work, Reading techniques ,	Use of past tense, Summarising , evaluating, comprehension
JAM	Effective techniques , Good beginning , conclusion, tips, Use of line ups	Vocabulary, Sequencing, Fluency, Thinking spontaneously
Group discussion	Expressing opinion, body language,	Expressing opinion, agree/ disagree, fluency,Persuasive and leadership skills
Mock interview	FAQs , body language	Role play, body language,
Making presentations	Student presentations	Using charts , pictures, interpreting data, sequencing,PPTs

Communicative methodology (CLT) should be used to create an interactive class. Apart from the suggestions given teachers are free to innovate to use any activity to improve the language competence of students . Attention can also be given to improve the accent and intonation of students.

Note:

* This subject is a theory subject.

** The workload should be calculated as theory workload.

***Examinations in the subject will be treated as a practical one.

MICROPROCESSORS LAB PRACTICE

Subject Title	**:**	**Microprocessors Lab**
Subject Code	**:**	**CM - 409**
Periods per Week	**:**	**03**
Periods per Semester	**:**	**45**

LIST OF EXPERIMENTS

1. Write an assembly language program to perform arithmetic operations on two 16-bit numbers.
2. Write an assembly language program to add two BCD numbers.
3. Write an assembly language program to implement searching on an array.
4. Write an assembly language program to sort the numbers in an array
5. Write an assembly language program to find the factorial of a number.
6. Write an assembly language program to manipulate strings.
7. Write an assembly language program to implement pattern matching.
8. Write an assembly language program to move data from one location to another location.
9. Write a program for generating multiplication table for a given number
10. Write an assembly language program to count number of ones and zeros in a number.

OBJECTIVES AND KEY COMPETENCIES

Exp. No.	Name of the experiment	Objectives	Key Competencies
1	Write an assembly language program to perform arithmetic operations on two 16-bit numbers.	Write an assembly language program and perform arithmetic operations like addition, subtraction, multiplication and division on two 16-bit numbers.	1) Understand the execution process of assembly language program. 2) Identify the registers required to store the data. 3) Use appropriate statements for each operation 4) Write the code. 5) Run the program and test the results. 6) Resolve the errors if any through debugging.
2	Write an assembly language program to add two BCD numbers.	Write an assembly language program to perform addition on two BCD numbers of various lengths.	1) Identify the registers required to store the data. 2) Use statements to perform addition. 3) Write the code. 4) Run the program and test the results. 5) Resolve the errors if any through debugging.
3	Write an assembly language program to implement searching on an array.	Write an assembly language program to implement searching like finding the largest number in an array.	1) Identify the registers/memory locations required to store the data. 2) Use instructions like JMP. 3) Write the code. 4) Run the program and test the results. 5) Resolve the errors if any through debugging.
4	Write an assembly language program to sort the numbers in an array	Write an assembly language program to implement sorting on an array like sorting 8-bit numbers in ascending order.	1) Identify the registers/memory locations to store the data. 2) Write the code using JMP, CALL, PROC etc. 3) Run the program and test the results. 4) Resolve the errors if any through debugging.
5	Write an assembly language program to find the factorial of a number.	Write an assembly language program to find the factorial of a number of different lengths like 8-bit, 16-bit etc	1) Identify the registers required to store the data. 2) Use instructions like JMP, subroutines etc 3) Write the code. 4) Run the program and test the results. 5) Resolve the errors if any through debugging.
6	Write an assembly language program to manipulate string.	Write an assembly language program to manipulate strings like reversal, concatenation etc.	1) Identify the registers required to store the data. 2) Write the code. 3) Run the program and test the results.
7	Write an assembly language program to implement pattern matching	Write an assembly language program to implement pattern matching like searching for a given string in a paragraph.	1) Identify the registers required to store the data. 2) Write the code using registers like DI, SI etc. 3) Run the program and test the results. 4) Resolve the errors if any through debugging.

8	Write an assembly language program to move data from one location to other.	Write an assembly language program to move data of various lengths from one location to other.	1) Identify the registers to move the data. 2) Write the code. 3) Run the program and test the results.
9	Write an assembly language program for generating multiplication table for a number.	Write an assembly language program for generating multiplication table for a number up to 10 multiplication factors.	1) Identify the registers required to store the data. 2) Write the code using loop statements. 3) Run the program and test the results. 4) Resolve the errors if any through debugging.
10	Write an assembly language program to count number of ones and zeros in a number.	Write an assembly language program to count number of ones and zeros in a number of 8-bit/16-bit.	1) Identify the registers required to store the data. 2) Write the code. 3) Run the program and test the results. 4) Resolve the errors if any through debugging.

C++ Lab Practice

Subject Title	**:**	**C++ Lab**
Subject Code	**:**	**CM - 410**
Periods per Week	**:**	**06**
Periods per Semester	**:**	**90**

LIST OF EXCERCISES

Object Oriented Programming with C++

1 Write programs using input and output operators and comments.
2 Write programs using if/ if – else/ nested if statement.
3 Write programs using loop statements – while/ do-while / for.
4 Write programs using arrays.
5 Write programs using classes & object.
6 Write programs using constructor and destructor.
7 Write programs working with two/more classes using Friend function.
8 Write programs using inline function.
9 Write a program to pass an object as a functions argument – pass object by value, pass object by reference.
10 Write a program to demonstrate the use of operator overloading on unary operator & binary operators like ++ operator and << operator.
11 Write a program to demonstrate the use of function overloading.
12 Write a simple program on array of objects and pointers to objects.
13 Write programs using new, delete with classes.
14 Write simple programs illustrating use of all types of inheritances.
15 Program illustrating virtual base class.
16 Program illustrating virtual functions.
17 Programs using templates.

OBJECTIVES AND KEY COMPETENCIES:

Exp. No.	Name of the experiment	Objectives	Key Competencies
1	Write programs using input and output operators and comments.	(a) Write a program to accept input and display it. (b) Write comments in a program.	(a) Identify the differences between C and C++. (b) Use header files. (c) Use *cin* and *cout*. (d) Write comments. (e) Compile the program. (f) Rectify the errors in the program. (g) Run the program. (h) Test the output with various input data. (i) Save the file.
2	Write programs using if/ if – else/ nested if statement.	Write programs using conditional control statement.	(a) Identify the differences between C and C++. (b) Use various conditional control statements. (c) Compile the program. (d) Rectify the errors in the program. (e) Run the program. (f) Test the output with various input data. (g) Save the file.
3	Write programs using loop statements – while/ do-while / for.	(a) Write a program using loop statements. (b) Write the same program using other loops.	(a) Identify the differences between C and C++. (b) Use various loop statements. (c) Compile the program. (d) Rectify the errors in the program. (e) Run the program. (f) Observe the output with various input data. (g) Save the file. (h) Write the same program using while/ do – while/ for statement.
4	Write programs using arrays.	Write programs using arrays.	(a) Use arrays. (b) Declare array. (c) Rectify the errors. (d) Test the output.
5	Write programs using classes & object.	(a) Write a program using classes and objects and define the methods within the class. (b) Write a program using classes and objects and define the methods outside the class.	(a) Create a class, and its syntax. (b) Add data members and methods to a class. (c) Declare methods within the class and outside the class. (d) Use scope resolution operator. (e) Create objects of a class. (f) Execute the program.

6	Write programs using constructor and destructor.	(a) Write a program using default constructor. (b) Write a program using parameterized constructor. (c) Write a program using copy constructor. (d) Write a program using constructor and destructor.	(a) Purpose of various types of constructors. (b) Purpose of destructor. (c) Use constructor and destructor.
7	Write programs working with two/more classes using friend function.	Write a program using friend function.	(a) Necessity of friend functions. (b) Declare friend function.
8	Write programs using inline function.	Write a program using inline function.	(a) Declare inline function with syntax. (b) Difference between function and inline code.
9	Write a program to pass an object as a function argument.	Write a program to pass an object as a functions argument (a) pass object by value, (b) pass object by reference.	(a) Pass objects by value. (b) Pass objects by reference.
10	Write a program to demonstrate the use of operator overloading on unary operator & binary operators like ++ operator and << operator.	(a) Write a program using unary operator. (b) Write programs using binary operator.	(a) Use operator overloading for unary and binary operators. (b) Declare methods for operator overloading.
11	Write a program to demonstrate the use of function overloading.	Write program to illustrate the usage of function overloading.	(a) Use function overloading. (b) Declare methods in function overloading.
12	Write a simple program on array of objects and pointers to objects.	Write a simple program on array of objects and pointers to objects.	(a) Create array of objects. (b) Create pointers to objects.
13	Write programs using new, delete with classes.	Write programs to illustrate the use of new and delete with classes.	Use dynamic allocation operators.
14	Write simple programs illustrating use of all types of	Write simple programs illustrating use of (a) single inheritance. (b) multiple inheritance.	(a) Create base class and derived class. (b) Use : operator. (c) Use access specifiers.

	inheritances.	(c) multilevel inheritance.	
15	Program illustrating virtual base class.	Write a program to illustrate the usage of virtual base class.	(a) Create virtual base class. (b) Use virtual keyword.
16	Program illustrating virtual functions.	Write a program to illustrate the usage of virtual functions.	(a) Create virtual functions. (b) Use virtual keyword.
17	Programs using templates.	Write a program to illustrate the usage of templates.	(a) Create function templates with single argument. (b) Create function templates with multiple arguments. (c) Create class templates.

V SEMESTER

JAVA PROGRAMMING

Subject Title : JAVA Programming
Subject Code : CM - 501
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUEPRINT

S. No.	Major Topic	No. of Periods		Weightage of Marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
	UNIT I - Features of Java	**5**		**6**						
1	Importance of Java, Compare Java & C++, Applet & its features	2	3		4	0	0	0	0	0
2	Byte Code, JVM, white space, keywords, separators, comments.	3	3		3	0	0	0	0	0
	UNIT II - Basics and usage of Classes, Objects, Inheritance	**20**		**39**						
1	Data types, literals, type conversion and casting, one dimensional & two dimensional array, operators	4	6		3	0	0	1	0	2
2	Selection & Iteration statements, jump, break & continue, classes & objects, method overloading.	8	6		2	0	0	1	0	5
3	Static & final, strings, command-line arguments, inheritance, overriding.	8	6		3	0	0	1	0	3
	UNIT III - Packages and Interfaces	**15**		**26**						
1	Packages	7	6		3	0	0	1	0	1
2	Interfaces	8	6		3	0	0	1	0	1
	UNIT IV - Multithreaded Programming and Exception Handling	**10**		**26**						
1	Threads, interthread communication, dead lock	5	6		5	0	0	1	0	4
2	Exception Handling	5	6		2	0	0	0	0	2
	UNIT V - I/O Streams and Applets	**10**		**13**						
1	I/O Streams	5	3		2	0	0	0	0	1
2	Applets	5	6		2	0	0	0	0	2
	TOTAL	60		110	10			8		

OBJECTIVES

On completion of the study of the course the student shall be able to:

1.0 Understand the Features of Java.

1.1 Describe the importance of Java in Internet programming.

1.2 Compare Java & C++.

1.3 Define an Applet.

1.4 Explain the features of Java applets.

1.5 Explain the applications of Java Applets.

1.6 Explain 'Byte codes' of Java, JVM.

1.7 Explain the process of entering and executing a Java program.

1.8 Describe white space, literals, separators, keywords in Java.

1.9 Write comment statements in Java.

2.0 Know basics & usage of Classes, Objects & Inheritance.

2.1 Explain eight simple types of data.

2.2 Explain Java literals.

2.3 Declare and initialize variables.

2.4 Perform type conversion and casting features.

2.5 Use one-dimensional and two–dimensional array.

2.6 Explain various types of operators.

2.7 Write the syntax of selection statements of Java.

2.8 Write the syntax of iteration statements of Java.

2.9 Write the syntax of jump, break, and continue statements.

2.10 Create classes and objects.

2.11 Use new operator and methods.

2.12 Use constructors.

2.13 Explain method overloading.

2.14 Use of ‘this’ pointer.

2.15 Explain the working of static and final.

2.16 Explain string classes and methods.

2.17 Use command-line arguments.

2.18 Implement inheritance

2.19 Create multi level hierarchy.

2.20 Use ‘final’ to avoid overriding.

3.0 Know how to create Package and Interfaces.

3.1 Define a package.

3.2 Describe the concept of class path.

3.3 Describe the concept of Access protection.

3.4 Use a class from another class.

3.5 Appreciate the concept of importing packages.

3.6 Explain the concept of Interfaces.

3.7 Define an Interface.

3.8 Write the difference between class and interface.

3.9 Implement interfaces.

3.10 Explain the scope of variables in interfaces.

4.0 Know Multi threaded programming and Exception handling.

4.1 Explain the thread model of Java.
4.2 Explain thread priorities.

4.3 Explain the concept of synchronization.
4.4 Implement the thread class and runnable interface.
4.5 Create thread.
4.6 Create multiple threads.
4.7 Describe alive( ), join ( ), suspend( ), resume( ) methods.
4.8 Explain Inter thread communication.
4.9 Explain dead lock.
4.10 Explain the sources of errors.
4.11 Write the advantages of Exception handling.
4.12 Explain how to deal with exceptions.
4.13 Explain the concept of Multi-catch statements programs.
4.14 Explain the types of Exceptions.

5.0 I/O streams and Applets.

5.1 Explain the concept of streams.
5.2 Explain various stream classes.
5.3 Describe the Basics of Applets – Life cycle of an applet.
5.4 Describe Applet classes, Applet Architecture.
5.5 Describe Applet Selection.
5.6 Explain the order of Applet initialization and termination.
5.7 Write a simple example for creating Applets.

COURSE CONTENTS

1. Java Features: Importance of Java to Internet – Java applets – Applications – Byte codes. Features of Java: OOPS concepts – literals – comments writing – key words – separators.

2. Basics & Usages of Classes, Objects, & Inheritance: Data types – declaring variable – scope – life time type conversions – casting – Arrays. Operators: Types of operators – order of precedence of operators – selection statements – control statements – jumping statement – break, continue statements, Usage of classes – objects – new – methods – constructors – method overloading, string classes – command line arguments. Usages of Inheritance: inheritance super class, sub classes – Multi level hierarchy – overriding – DMP concept.

3. Packages and Interfaces: Concept of packages & Interfaces – importing of packages – implementing Interfaces.

4. Multi threading and Exception Handling: Define thread – life cycle of thread - Multi threading - Inter thread communication – Dead locks – Thread properties – Exception handling: Source of errors – error handling – avoiding, handling – throwable classes.

5. I/O Stream and Applets: I/O streams, Basics of Applets – creating Applet – life cycle of an applet.

REFERENCE BOOKS

1. The complete reference Java -- Pattrick Naughten, Herbert Schildt TMH company Limited, New Delhi.
2. Programming in JAVA -- P. Radhakrishna, University Press
3. Programming in Java -- Muthu - Thomson

4. Java Foundations of Programming – NIIT, PHI

5. Programming with Java -- Balagurusamy, TMH

SOFTWARE ENGINEERING

Subject : Software Engineering
Subject code : CM – 502
Periods per Week : 04
Periods per semester : 60

TIME SCHEDULE & BLUE PRINT

S.No	Major topic	No.of Periods		Weightage of marks	Short type			Essay type		
		Theory	Practice		R	U	A	R	U	A
	Unit-I									
1	Evolution and Impact of Software Engineering	1		3	1					
2	Difference between Programs and Software Products	1			1					
3	Evolution of Software Engineering Design	4		5	1	1		1	1	
4	Software Life Cycle Models	4		5	1	1		1	1	
	Unit-II									
5	Responsibilities of a Software Project	1		3	1					
6	Project planning	2		3		1				
7	Metrics	2		5		1				
8	Project Estimation Techniques	3		8	1		1		1	1
9	Staffing Level Estimation	2								
10	Scheduling	3		5		1			1	
11	Staffing	1					1			
12	Risk Management	3		5	1	1				
	Unit-III									
13	Requirement Gathering and Analysis	2		3	1	1				
14	SRS Document - Functional Requirements & Characteristics	6		13	3	1		1		1
	Unit-IV									
15	Good Software Design	1		3		1				
16	Cohesion and Coupling	2		5		1			1	
17	Software design approaches	3		13	1			1		
18	User Interface Design	5								
19	Software coding and testing	5		10		1	1		1	
20	Debugging	4		8	1	1		1		
	Unit-V									
21	Software Reliability,	2		3	2					
22	Statistical Testing	1		5				1		
23	Software Quality - Management System - SEI CMM	2		5				2		
	Total	60		110	15	12	3	8	6	2

OBJECTIVES

On completion of the study of the subject the student should be able to comprehend the following

1.0 Understand the basics of Software Engineering Designs & Life Cycle Models

1.1 Know the Evolution and Impact of the Software Engineering

1.1.1 Evolution of an Art to an Engineering Discipline

1.1.2 A Solution to the Software Crisis?

1.2 Know the difference between Programs and Software Products

1.3 Understand the evolution of Software Engineering Design

1.3.1 Early Computer Programming

1.3.2 High Level Language Programming

1.3.3 Control Flow-Based Design

1.3.4 Data Structure-Oriented Design

1.3.5 Data Flow-Oriented Design

1.3.6 Object Oriented Design

1.3.7 Other Developments

1.4 Explain the Software Life Cycle Models

1.4.1 Classical Waterfall Model

1.4.2 Iterative Water fall Model

1.4.3 Prototyping Model

1.4.4 Evolutionary Model

1.4.5 Spiral Model

1.4.6 Comparison of Different Life Cycle Models

2.0 Understand the Software Project Management

2.1 Know the Responsibilities of a Software Project Manager

2.1.1 Job Responsibilities of a Software Project Manager

2.1.2 Skills Necessary for Software Project Management

2.2 Know about Software Project Planning

2.2.1 The SPMP Document

2.3 State the Metrics for Project Size Estimation

2.3.1 Lines of Code

2.3.2 Function Point Metric

2.4 Explain the three Project Estimation Techniques

2.4.1 Empirical Estimation Technique

2.4.2 Heuristic Technique

2.4.3 Analytical Estimation Technique

2.5 Explain the two different works of Staffing Level Estimations

2.5.1 Nordens Work

2.5.2 Putnam's Work

2.6 Understand the four ways of Scheduling

2.6.1 Work Break Down Structure

2.6.2 Activity Networks and Critical Path Method

2.6.3 Gantt Charts

2.6.4 PERT Charts

2.7 Learn how to do Staffing – " Who is a Good Software Engineer?"

2.9 Explain Risk Management

2.9.1 Risk Identification

2.9.2 Risk Assessment

2.9.3 Risk Containment

3.0 Understand the concepts in Requirement Analysis & Specifications

3.1 Requirements Gathering and Analysis

3.2 Software Requirement Specifications(SRS)

3.2.1 Contents of the SRS Document

3.2.2 Functional Requirements

3.2.3 How to identify the Functional Requirements

3.2.4 How to Document the Functional Requirements Traceability

3.2.5 Characteristics of a Good SRS Document

3.2.6 Examples of Bad SRS Document

3.2.7 Organization of the SRS Document

4.0 Learn and understand the concept of Software Design, Coding & Testing

4.1 What is a good Software Design?

4.2 Define and Classify Cohesion and Coupling

4.2.1 Classification of Cohesiveness

4.2.2 Classification of Coupling

4.3 Know the two approaches of Software Design

4.3.1 Function-Oriented Design

4.3.2 Object-Oriented Design

4.3.3 Function-Oriented vs Object-Oriented Design

4.4. Understand the concept of User Interface Design

4.4.1 List the Characteristics of a good User Interface.

4.4.2 Understand the Basic Concepts - User Guidance and Online Help - Mode Based vs Modeless Interface -Graphical User Interface (GUI) vs Text-Based User Interface.

4.4.3 List the two types of User Interfaces - Command Language Based Interface - Menu Based Interface - Direct Manipulation Interfaces.

4.4.4 Know about Component Based GUI Development Window System and Types of Widgets.

4.5 Understand the concept of Software Coding and Testing

4.5.1 Coding Standards and Guidelines - Code Review- Code Walk-

Throughs - Code Inspection.

4.5.2 Clean Room Testing - Software Documentation- Software Testing

4.5.3 Know What is Testing?

4.5.4 Differentiate Verification and Validation -

4.5.5 List 3 Designs of Test Cases –

4.5.6 Differentiate Testing in the Large vs Testing in the Small-

4.5.7 Understand Unit Testing - Driver and Stub Modules-

4.5.8 Understand box Testing and White Box Testing.

4.6 Explain the concept of Debugging

4.6.1 Explain the Debugging Approaches.

4.6.2 List the Debugging Guidelines.

4.6.3 Program Analysis Tools - Static Analysis Tools - Dynamic Analysis Tools.

4.6.4 List and Explain the four Integration Testings - Phases vs Incremental Integration Testing- System Testing - Performance Testing.

5.0 Reliability, Quality Management & Maintenance

5.1 Understand the concept of Software Reliability

5.1.1 Differentiate Hardware Reliability and Software Reliability

5.1.2 List the different Reliability Metrics

5.1.3 Understand the Reliability Growth Modeling

5.2 Define Statistical Testing

5.3 Define Software Quality

5.4 Software Quality Management System

5.4.1 Understand the Evolution of Quality Systems

5.5 Define SEI Capability Maturity Model

COURSE CONTENTS

1. Introduction to Software Engineering- Life Cycle Models.

2. Software Project Management- Responsibilities of a Software Project

Manager- Project planning – Metrics-Project Estimation Techniques- Staffing Level Estimation - Scheduling – Risk Management

3. Requirement Analysis and Specification: Requirement Gathering and Analysis - SRS document

4. Software Design , Coding and Testing: Good software design, Cohesion and Coupling, Software Design Approaches, User interface Design, Software Coding and Testing, Debugging

5. Software Reliability, Quality Management and maintenance – software Reliability- Statistical Testing, Software Quality, Software Quality Management System, SEI capability Maturity Model

REFERENCE BOOKS

1. Fundamentals of Software Engineering – Rajib Mall (PHI) Second Edition.
2. Software Engineering - Jawadekar (TMH)
3. Software Engineering Concepts - Fairley (TMH)
4. Pankaj Jalote international approach to software engineering ":2nd edition

Narosal publishing house 1997

ADVANCED DATABASE SYSTEMS

Subject Title : Advanced Database Systems
Subject Code : CM– 503
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE AND BLUEPRINT

S. No.	Major Topic	No. of Periods		Weightage of Marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
	UNIT I - Advanced Database Concepts	**5**		**16**						
1	Transaction - properties, management with SQL, log	2	0		3	0	0	1	0	0
2	Concurrency Control	3	0		2	0	0	1	0	0
	UNIT II - Distributed Database Management Systems	**20**		**29**						
1	DDBMS, advantages & disadvantages, twelve commandments	8	0		3	0	0	4	0	0
2	Distributed processing, transparency features, Distributed Database Design	12	0		8	0	0	4	0	0
	UNIT III - Object Oriented Database Systems	**15**		**26**						
1	Protocol, Inheritance	5	0		2	0	0	1	0	0
2	Object Classification, Characteristics	5	0		2	0	0	2	0	0
3	OOD management Systems	5	0		1	0	0	2	0	0
	UNIT IV - Data Warehousing	**15**		**26**						
1	DSS, Data Warehouse	8	0		3	0	0	3	0	0
2	OLAP, Star Schemes	7	0		4	0	0	5	0	0
	UNIT V - Data Mining	**5**		**13**						
1	Data Mining, On what data	2	0		2	0	0	1	0	0
2	Data mining functionalities	3	0		2	0	0	3	0	0
	TOTAL	60	0	110	10			8		

OBJECTIVES:

On completion of the study of the course the student shall be able to:

1.0 Understand Advanced Database Concepts

1.1 Define Transaction.
1.2 Explain Transaction properties.
1.3 Explain Transaction management with SQL.

1.4 Explain Transaction log.
1.5 Describe Concurrency Control
1.5.1 Lost updates.
1.5.2 Uncommitted data.
1.5.3 Inconsistent retrievals.
1.5.4 The scheduler.

2.0 Know Distributed database management Systems

2.1 Define DDBMS.
2.2 Explain the Advantages and disadvantages.
2.3 Explain Components of DDBMS.
2.4 Explain C J Date's Twelve commandments.
2.5 Describe Distributed processing
2.6 Write the difference between distributed databases & distributed processing.
2.7 Explain the Levels of data and process distribution.
2.8 Describe Distributed database transparency features
2.6.1 Distributed transparency.
2.6.2 Transaction transparency.
2.6.3 Performance transparency.
2.7 Describe Distributed database design
2.7.1 Explain Data fragmentation.
2.7.2 Horizontal Fragmentation.
2.7.3 Vertical fragmentation.
2.7.4 Mixed fragmentation.
2.8 Describe Data replication.
2.9 Describe Data allocation.

3.0 Know Object Oriented Database Systems

3.1 Write about Class Protocol.
3.2 Define Superclasses, subclasses, inheritance.
3.3 Describe Object classification.
3.4 Write the Characteristics of an object oriented data model
3.5 Describe Object schemas.
3.6 Describe Class-subclass relationships.
3.7 Describe Interobject relationships.
3.8 Define Late and early binding.
3.9 Describe Support for versioning.
3.10 Explain OOD management systems
3.11 Write the features of an OODBMS.
3.12 Write the advantages and disadvantages of OODBMS.

4.0 Know Data warehousing

4.1 Explain Decision support systems (DSS)
4.1.1 Write the need for Data analysis.

4.1.2 Differentiate Operator data, Decision support Data.
4.1.3 Explain DSS Database requirements.

4.2 Define data warehouse
4.2.1 Explain DSS architectural styles.
4.2.2 Explain the twelve rules that define a data warehouse.

4.3 Define Online analytical processing (OLAP)
4.4 Explain OLAP architecture.
4.5 Explain Relational OLAP.
4.6 Explain Multi Dimentional OLAP.
4.7 Differentiate ROLAP, MDOLAP.
4.8 Describe Star Schemas
4.4.1 Facts.
4.4.2 Dimensions.
4.4.3 Attributes
4.4.4 Hierarchies.

5.0 Understand Data Mining

5.1 Define data mining.
5.2 Explain Data Mining – On what kind of data.
5.3 Explain The following Data Mining functionalities.
5.3.1 Concept/ Class description : Characterization and discrimination.
5.3.2 Mining frequent patterns, Associations and correlations.
5.3.3 Classification and prediction.
5.3.4 Cluster Analysis.
5.3.5 Describe Outlier Analysis.
5.3.6 Evolution Analysis.

COURSE CONTENTS:

1**. Transactions**

Transaction, Transaction properties, Transaction management with SQL, Transaction log, Concurrency control, Lost updates, uncommitted data and scheduler.

2 Distributed database Management Systems

DDBMS, Advantages and disadvantages, Components of DDBMS, Twelve commandments, concept of Distributed processing, Levels of data and process distribution, Distribution transparency, Transaction transparency, Performance transparency, Data fragmentation, Horizontal fragmentation, Vertical fragmentation, Mixed fragmentation, Data replication, Data allocation.

3. Object oriented Database systems

Object schemas, Class subclass relationships, Interobject relationships, Late and early binding, Support for versioning, Features of an OODBMS, Advantages and disadvantages, Distinguish between OODBM vs. RDBM.

4. Data warehousing

Analyze The need for Data analysis, Distinguish between Operational data and Decision support Data, DSS Database requirements, DSS architectural styles, the Twelve rules that define a data warehouse, OLAP architecture, Relational OLAP, Star Schemes.

5. Data Mining

What is data mining, Data Mining – On what kind of data, Data Mining functionalities, Concept/ Class description : Characterization and discrimination, Mining frequent patterns, Associations and correlations, Classification and prediction, Cluster Analysis, Outlier Analysis, Evolution Analysis.

References :

1. Database Systems – Design , implementation and Management by Rob – Cornel IV edition Thomson publications

2. Data mining : Concepts and Techniques – Jiawei Han and Michelin Khamber

3. Data warehousing concepts, techniques, products and applications – CSR Prabhu II PHI

4. Data warehousing – Amitesh Sinha Thomson publications

5. “Principles of Distributed Database Systems”

-M. Timer, Ozsu and Patrick Valduriez, II edition Pearson education

6. “Object Oriented Databases” – Setrag Khos Shafian,

John Wiley &Sons Inc., 1993

7. Data warehousing, Data mining and OLAP – Tata McGraw Hill Alex Berson and Stephen J Smith.

WEB DESIGNING

Subject Title : Web Designing
Subject Code : CM – 504
Periods per Week : 04
Periods per Semester : 60

TIME SCHEDULE & BLUE PRINT

S.No	Major Topic	No. of Periods		Weightage of Marks	Short Type			Essay Type		
		Theory	Practice		R	U	App	R	U	App
	Unit - 1 : Principles of Web design			**3**						
1	Anatomy of Web page	2	0		0	1	0	0	0	0
2	Building and maintaining web site	2	0		0	1	0	0	0	0
	Unit - 2 : HTML & CSS			**29**						
3	Tags and Attributes	7	7		0	0	1	0	0	1
4	Presentation formats	2	3		0	1	0	0	0	1
5	Controls	5	4		0	0	1	0	0	1
6	Creating and linking style sheets	3	1		0	1	0	0	0	1
	Unit - 3 : XML & Web Servers			**16**						
7	Structuring data in XML	1	1		0	1	0	0	0	1/2
8	Parsing and Validating XML	2	0		1	0	0	1/2	0	0
9	Applications of XML	1	0		1	0	0	0	1/2	0
10	Client-Side versus Server-Side Scripting	1	0		0	1	0	0	1/2	0
11	Architecture of Web Server	1	0		0	1	0	0	1/2	0
12	Web Server examples	1	1		0	1	0	0	0	1/2
	Unit - 4 : JavaScript			**31**						
13	Introduction	1	0		1	0	0	0	0	0
14	Operators	1	2		0	0	1	0	0	1/2
15	Conditional and Iterative statements	6	4		0	0	1	0	0	1
16	Functions	2	2		0	1	0	0	0	1
17	Arrays	2	2		0	0	1	0	0	1
18	Objects	1	1		1	0	0	1/2	0	0
	Unit - 5 : PHP			**31**						
19	Fundamentals	1	0		0	1	0	0	0	0
20	Loops, Strings, Statements	8	6		0	0	1	0	0	1
21	Arrays	2	2		0	0	1	0	0	1
22	Functions	2	2		0	1	0	0	0	1
23	Databases	5	6		0	1	0	0	0	1
24	Cookies and Sessions	1	1		0	1	0	0	1/2	0
	TOTAL	60	45	110	10			08		

OBJECTIVES

On completion of the study of the course the student shall be able to:

1. Explain the principles of Web Designing.

1.1 Describe the anatomy of web page.
1.2 Illustrate the format of web page.
1.3 Identify various Web page elements.
1.4 Explain the process of navigation through web pages
1.5 State the steps in building a web site
1.6 State the steps in launching a web site.
1.7 State the steps in maintaining a web site.

2. Use various HTML tags and apply style sheets.

2.1 Describe the importance of HTML.
2.2 Use the basic tags <html>, <head>, <title>, <body>.
2.3 Use the following tags with attributes,
- <h1> to <h6>
- <q>
-
- <cite>
- <big>
- <small>
- <ins>
- <del>

2.4 Use the following presentation tags with attributes,
- <b>
- <i>
- <u>
- <strike>
- <sub>
- <sup>
-
- <font>
- <marquee>.

2.5 Use the hyperlink and imaging tags with attributes.
2.6 Use the <object> tag with all important attributes.
2.7 Use the listing tags along with attributes.
2.8 Use colors to various HTML elements.
2.9 Use the following table creation tags with attributes,
- <table>
- <col>
- <colgroup>.
- <tr>
- <td>
- <th>
- <tbody>
- <thead>
- <tfoot>

2.10 Use the following control tags with attributes,

- <form>
- <input>
- <button>
- <label>
- <select>
- <options>
- <textarea>
- <legend>.

2.11 Use the following frame tags with attributes,

- <frame>
- <frameset>
- <noframe>
- <iframe>.

2.12 Apply cascading style sheets

2.12.1 Create Inline styles.
2.12.2 Create embedded style sheets.
2.12.3 Resolve style conflicts.
2.12.4 Link external style sheets to a HTML page.
2.12.5 Place HTML elements at required position.
2.12.6 Change background colors, images etc.
2.12.7 Set the properties margin, padding, height, width to an element.

2.13 List the applications of HTML.

3. Create XML file and explain about web servers.

3.1 Create XML file

3.1.1 Describe the organization of data in the form of XML.
3.1.2 State the significance of Namespace
3.1.3 Compare and Contrast DTD and Schema
3.1.4 Understand the parsing process of XML by DOM and SAX.
3.1.5 List the applications of XML

3.2 Explain about Web servers

3.2.1 Distinguish Client-side and Server-side scripting.
3.2.2 Illustrate the architecture of Web server.
3.2.3 Identify various HTTP request types and their difference.
3.2.4 Understand the installation process of IIS, PWS and Apache web servers.
3.2.5 Compare/Contrast IIS, PWS and Apache.
3.2.6 Describe the steps to place and request HTML, PHP documents from web servers.

4. Implement client side scripting using Java Script.

4.1 Describe the need for client side scripting.
4.2 List various client side scripting languages.
4.3 Use various operators.
4.4 Use **if, if/else** and **switch** conditional statements.
4.5 Use **while**, **do/while** and **for** iterative statements.
4.6 Write small programs using conditional and iterative statements.
4.7 Understand the process of debugging JavaScript code.
4.8 Implement functions

4.8.1 Define and call a function.

4.8.2 Illustrate parameter passing.
4.8.3 List and explain global functions provided by JavaScript.
4.8.4 Explain the scope and lifetime of variables.
4.8.5 Write small programs using recursion.

4.9 Implement arrays
4.9.1 Understand single and multi dimensional arrays.
4.9.2 Declare an array.
4.9.3 Manipulate an array.
4.9.4 Write small programs using arrays.

4.10 List various Objects provided by JavaScript.

5. Implement Server side scripting using PHP.

5.1 Understand the installation of PHP

5.2 Explain the fundamentals of PHP
5.2.1 Combine HTML and PHP.
5.2.2 List and explain various Data types with examples.
5.2.3 Declare variables and constants.
5.2.4 Use various Operators.

5.3 Implement various loop statements with examples

5.4 Implement various conditional statements with examples

5.5 Understand string manipulation using string functions

5.6 Write small programs using loops and conditional statements

5.7 Implement arrays
5.7.1 Understand single and multi dimensional arrays.
5.7.2 Declare an array.
5.7.3 Manipulate an array.
5.7.4 Write small programs using arrays.

5.8 Implement functions
5.8.1 Define user defined function.
5.8.2 State the importance of user defined function.
5.8.3 Describe the process of passing arguments.
5.8.4 Explain the scope and lifetime of variables.
5.8.5 Write small programs using functions.

5.9 Implement the concept of accessing databases
5.9.1 Understand basic database concepts.
5.9.2 Explain the steps for connecting to a database
5.9.3 List and explain the steps to do the following,
5.9.3.1 Retrieving data from a table.
5.9.3.2 Inserting data into a table.
5.9.3.3 Updating the data in a table.
5.9.3.4 Deleting data from a table.
5.9.4 Write some simple programs to insert, delete, update and retrieve data from database.

5.10 Describe the significance cookie and session
5.10.1 Define Session and Cookie.
5.10.2 State the importance of Session and Cookie.
5.10.3 Create and delete a cookie.
5.10.4 Use query string to pass data.
5.10.5 Understand Session function.
5.10.6 Use session variables.

5.11 Explain the process of debugging PHP code.

COURSE CONTENTS

1. PRINCIPLES OF WEB DESIGN

Anatomy of Web page, Format, Elements, Navigation, Building, Launching and maintaining web site

2. HTML & CSS

HTML – Introduction, Format of web page, Tags and attributes, Formatting text, Adding images, Positioning. Lists, Colors, Connecting to hyperlinks, Tables, Forms, Frames

CSS – Introduction, Inline styles, Embedded style sheets, Conflicting styles, Linking external style sheets, Positioning elements, Backgrounds, Element dimensions

3. XML & Web Servers

XML – Introduction, Structuring Data, XML Namespaces, DTD and Schemas, Document Object Model (DOM), Simple API for XML (SAX), Applications of XML

Web Servers – Introduction, HTTP Request Types, System Architecture, Client-Side versus Server-Side Scripting, Accessing Web Servers, IIS, PWS, Apache, Requesting HTML, PHP documents

4. JAVA SCRIPT

Introduction to Scripting, Operators, Conditional Statements, Iterative Statements, Debugging

Functions – Function definitions, Duration of Identifiers, Scope rules, Global functions, Recursion

Arrays – Declaring and allocating arrays, References and reference parameters, Passing arrays to functions, Sorting and Searching arrays, Multiple-Subscripted arrays

Objects – **Math** object, **String** object, **Date** object, **Boolean** and **Number** object.

4. PHP

Fundamentals of PHP, Loops, Strings, Statements, Arrays, Functions, Databases, Cookies, Sessions, Debugging

REFERENCE BOOKS

1) Principles of Web Design, Sklar, TMH
2) HTML complete reference, Powell, THH
3) Internet & World Wide Web , Dietel and Dietel, Pearson education Asia.
4) Straight to the point PHP, Laxmi Publications
5) Basics of Web Site Design, NIIT – PHI
6) WWW Design with HTML, Xavier (TMH)

MOBILE COMMUNICATIONS

Subject Title ***:*** **Mobile Communications**
Subject Code **: CM – 505**
Periods per Week **: 04**
Periods per Semester **: 60**

TIME SCHEDULE & BLUE PRINT

S.No	Major topic	No.of Periods		Weightage of marks	Short type			Essay type		
		Theory	Practice		R	U	A	R	U	A
	Unit-I									
1	Applications, History of wireless communication, A simplified reference model	2		3	1	1				
2	Cellular systems	1		3		1				
3	Protocol and the TCP/IP suite	1			1	1				
4	Internet working, Internet protocol, Transmission control protocol, User datagram protocol	2		10	2	2				
5	Medium access control Motivation for specialized MAC Hidden & exposed terminals Near & far terminals	2			1	2				
	Unit-II									
6	Introduction, Mobile services	4		3	1					
7	System architecture			5					1	
8	Radio interface	2		5					1	
9	Protocols	2							1	
10	Localization & calling	2		5	1				1	
11	Handover	3		5	1				1	
12	Security				1				1	
13	New data services	2		3	1					
	Unit-III									
14	Satellite Systems	5		13	4	0		1	3	
15	Broadcast Systems	5		13	4	0		1	3	
	Unit-IV									
21	Infrared versus radio transmission	1		10					1	
22	Infrastructure & adhoc network	1							1	
23	IEEE 802.11	7		8	3	1			2	
24	Bluetooth: Applications & Standards	8		8	1					

	Unit-V Network Management									
25	Mobile IP	5		5	3	2			3	
26	IPV6			5					1	
27	DHCP	1							1	
28	Mobile Transport Layer	3		3	3					
29	Generations of Wireless Technology	1		3	4					
	Total	60		110	32	10	0	2	21	0

OBJECTIVES

On completion of the study of the subject the student should be able to comprehend the following

1.0 Understand the basic concepts of Mobile Communications

1.1 Application
1.2 History of wireless communication
1.3 A simplified reference model
1.4 Cellular systems
1.5 Protocol and the TCP/IP suite
  1.5.1 The need for a protocol architecture
  1.5.2 The TCP/IP protocol architecture
  1.5.3 Internet working
  1.5.4 Internet protocol
  1.5.5 Transmission control protocol
  1.5.6 User datagram protocol
1.6 Medium access control
  1.6.1 Motivation for specialized MAC
  1.6.2 Hidden & exposed terminals
  1.6.3 Near & far terminals

2.0 Understand the Concept of GSM technology in TELECOMMUNICATIONS SYSTEMS

2.1 GSM
2.2 Mobile services
2.3 System architecture
2.4 Radio interface
2.5 Protocols
2.6 Localization & calling
2.7 Handover
2.8 Security
2.9 New data services

3.0 Understand the concepts of SATELLITE SYSTEMS & BROADCASTING SYSTEMS

3.1 Satellite Systems

3.1.1 Applications
3.1.2 Basics
3.1.3 GEO
3.1.4 LEO
3.1.5 MEO
3.1.6 Routing
3.1.7 Localization
3.1.8 Handover

3.6 Broadcast systems
3.6.1 Over view
3.6.2 Cyclic repetition of data
3.6.3 Digital audio broadcasting
3.6.4 Multimedia object transport protocol
3.6.5 Digital video broadcasting

4.0 Understand the WIRELESS LAN technology

4.1 Differentiate Infrared and radio transmission
4.2 Explain Infrastructure network & ad hoc network
4.3 Explain IEEE 802.11
4.3.1 System architecture
4.3.2 Protocol architecture
4.3.3 Physical layer
4.3.4 Medium access control layer
4.3.5 Mac management
4.3.6 Future development
4.4 Explain Bluetooth
4.4.1 Bluetooth application
4.4.2 Bluetooth standards documents
4.4.3 Protocol architecture
4.4.4 Usage models
4.4.5 Piconets & Scatternets
4.4.6 Radio specification
4.4.7 Base band specification
4.4.8 Frequency hopping
4.4.9 Physical links
4.4.10 Packets (outline)
4.4.11 Error Correction
4.4.12 Logical channels
4.4.13 Channel control
4.4.14 Bluetooth Security
4.4.15 Link manager specification (outline)
4.4.16 Logical link control and adaptation protocol (outline)
4.4.17 L2CAP Channels
4.4.18 L2CAP packets
4.4.19 Signaling commands

4.4.20 Quality of service

5.0 Mobile network layer

5.1 Explain about Mobile IP
- 5.1.1 List the Goals, assumptions & requirements of Mobile IP
- 5.1.2 Define the Entities & terminology used in Mobile IP
- 5.1.3 Explain the process of IP packet delivery
- 5.1.4 Explain about Agent advertisement & discovery
- 5.1.5 Explain Registration
- 5.1.6 Explain Tunneling & encapsulation
- 5.1.7 List the Optimizations
- 5.1.8 Explain the process of Reverse tunneling
- 5.1.9 Understand Ipv6

5.2 Explain Dynamic host configuration protocol

5.3 Understand the following transmission techniques in Mobile transport layer
- 5.3.1 Traditional TCP
- 5.3.2 Congestion control
- 5.3.3 Slow start
- 5.3.4 Fast retransmit & fast recovery
- 5.3.5 Transmission / time out freezing
- 5.3.6 Selective retransmission
- 5.3.7 Transaction oriented TCP

5.4 List the features of 1G, 2G, 3G and 4G

COURSE CONTENTS :

1.0 INTRODUCTION

Application History of wireless communication A simplified reference model Cellular systems Protocol and the TCP/IP suite . The need for a protocol architecture The TCP/IP protocol architecture

Internet working Internet protocol Transmission control protocol User datagram protocol Medium access control Motivation for specialized MAC Hidden & exposed terminals Near & far terminals

2.0 Telecommunication Systems

GSM: Mobile services System architecture Radio interface Protocols Localization & calling Handover Security New data services

3.0 Satellite Systems & Broadcasting Systems

Satellite Systems:Applications, Basics: GEO LEO MEO, Routing, Localization, Handover Broadcast systems: Over view, Cyclic repetition of data, Digital audio broadcasting, Multimedia object transport protocol, Digital video broadcasting

4.0 Wireless LAN

Infrared versus radio transmission Infrastructure & adhoc network
IEEE802.11: System architecture, Protocol architecture, Physical layer, Medium access control layer, Mac management, Future development
Bluetooth: Bluetooth application, Bluetooth standards documents, Protocol architecture Usage models Piconets & Scatternets, Radio specification Baseband specification, Frequency hopping, Physical links Packets(outline), Error Correction, Logical channels Channel control, Bluetooth Security, Link manager specification (outline), Logical link control and adaptation protocol (outline), L2CAP Channels, L2CAP packets, Signaling commands, Quality of service

5.0 Mobile network layer

Mobile IP: Goals, assumptions & requirements, Entities & terminology, IP packet delivery, Agent advertisement & discovery, Registration, Tunneling & encapsulation, Optimizations, Reverse tunneling, Ipv6
Dynamic host configuration protocol,
Mobile transport layer: Traditional TCP, Congestion control, Slow start, Fast retransmit & fast recovery, Transmission / time out freezing, Selective retransmission, Transaction oriented TCP
Generations of Wireless Technology - 1G, 2G, 3G and 4 G

REFERENCE BOOKS

1. Mobile communications -----Jochen schiller, Pearson pub.

2. Wireless communications & networks ----- William stallings PHI

CLOUD COMPUTING

Subject : Cloud Computing
Subject Code : CM-506
Periods/Week : 4
Periods/Semester : 60

TIME SCHEDULE & BLUE PRINT

S.No	Major topic	No.of Periods		Weightage of marks	Short type			Essay type		
		Theory	Practice		R	U	A	R	U	A
	Unit-I Introduction to Cloud Computing									
1	Recent trends in Computing	1	0	3	0	1	0	0	0	0
2	Cloud Computing - Definition, History, Features, Principles & Challenges, Cloud Service Providers	5	0	6	4	2	0	0	0	0
3	Advantages and disadvantages of Cloud Computing, Comparison among recent trends of computing	2	0	5	0	0	0	0	2	0
	Unit-II Parallel and Distributed Computing									
4	Eras of Computing Concepts of Parallel Computing	5	0	13	3	0	0	0	3	0
5	Concepts of Distributed Computing	7	0	10	3	0	0	0	2	0
6	Parallel Vs Distributed Computing	1	0	3	1	0	0	0	0	0
	Unit-III Virtualization									
7	Introduction, Characteristics of Virtualized environments	1	0	3	1	0	0	0	0	0
8	Classification of Virtualization Techniques - Machine Level, Hardware Level, Operating system level, Programming Level, Application level	10	0	15	0	0	0	0	6	0
9	Virtualization and Cloud Computing, Pros and Cons of Virtualization,Virtualization Technologies – Examples	3	0	8	1	0	0	0	2	0
	Unit-IV Cloud Computing Architecture									

10	Cloud Reference Model – Architecture,Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS)	8	0	13	1	0	0	0	4	0
11	Types of Clouds– Public Clouds, Private Clouds, Hybrid Clouds and Community Clouds. Economics of Cloud	5	0	10	1	1	0	0	1	0
	Unit-V Cloud Security and Applications									
12	Security, Privacy and Trust	1	0	3	1	0	0	0	0	0
13	Infrastructure Security	5	0	10	0	0	0	0	3	0
14	Data Security	5	0	5	0	0	0	0	2	0
15	cloud applications	1	0	3	2	0	1	0	0	2
	Total	60		110	18	4	1	0	25	2

OBJECTIVES:

On completion of the study of the subject, the student should be able to

1.0 **Understand the basics of Cloud Computing:**

- 1.1 Define the following terms related to recent trends in Computing
  - 1.1.1 Cluster Computing
  - 1.1.2 Grid Computing
  - 1.1.3 Distributed Computing
  - 1.1.4 Utility Computing
- 1.2 Define Cloud Computing
- 1.3 State the history of Cloud Computing
- 1.4 List the features of Cloud Computing
- 1.5 State the basic principles of Cloud Computing
- 1.6 List the challenges of Cloud Computing
- 1.7 List the Cloud Service Providers
- 1.8 State the advantages and disadvantages of Cloud Computing
- 1.9 Compare Cluster Computing, Grid Computing, Distributed Computing, Utility Computing and Cloud Computing

2.0 Understand the concepts of Parallel and Distributed Computing

- 2.1 Know the eras of Computing
- 2.2 Understand the concepts of Parallel Computing
  - 2.2.1 Parallel Computing
  - 2.2.2 Hardware architecture for parallel processing
  - 2.2.3 Approaches to parallel processing
  - 2.2.4 Levels of Parallelism
  - 2.2.5 Laws of Cautions
- 2.3 Understand the concepts of Distributed Computing
  - 2.3.1 General Concepts and Definitions,
  - 2.3.2 Components of a Distributed System,
  - 2.3.3 Architectural Styles for Distributed Computing
    - 2.3.3.1 Software architectural Styles
    - 2.3.3.2 System Architectural Styles

2.3.4 Explain the models for Inter Process Communication
2.3.5 Know the technologies for Distributed Computing
2.3.5.1 Remote Procedure Call,
2.3.5.2 Distributed Object Frame Work
2.3.5.3 Service Oriented Computing
2.4 Differentiate Parallel and Distributed Computing

3.0 Understand the concepts of Virtualization
3.1 Define the term Virtualization
3.2 State the different characteristics of Virtualization
3.3 Classify and explain Virtualization Techniques
3.3.1 Machine Reference Model
3.3.2 Hardware Level Virtualization
3.3.3 Hardware Virtualization Techniques
3.3.4 Operating System Level Virtualization
3.3.5 Programming Language Level Virtualization
3.3.6 Application Level Virtualization
3.4 Explain the role of virtualization in Cloud Computing
3.5 State the Pros and Cons of Virtualization
3.6 Know the Virtualization Technologies – Examples
3.6.1 Xen
3.6.2 VM ware
3.6.3 Microsoft Hyper – V

4.0 Understand the Architecture of Cloud Computing
4.1 Describe the Cloud Reference Model –
4.1.1 Architecture
4.1.2 Infrastructure as a Service (IaaS)
4.1.3 Platform as a Service (PaaS)
4.1.4 Software as a Service (SaaS)
4.2 Explain the different types of Clouds (Deployment Models)
4.2.1 Public Clouds
4.2.2 Private Clouds
4.2.3 Hybrid Clouds
4.2.4 Community Clouds
4.3 Know the economics of Cloud

5.0 Cloud Security and Applications
5.1 Define Security, Privacy and Trust
5.2 Explain Infrastructure Security
5.2.1 Network Level Security
5.2.2 Host Level Security
5.2.3 Application Level Security
5.3 Explain Data Security
5.3.1 Aspects of Data Security
5.3.2 Data Security Mitigation
5.4 Applications of cloud computing
5.4.1 Scientific Applications
5.4.1.1 Health Care
5.4.1.2 Biology
5.4.1.3 Geo-Science – Satellite Image Processing
5.4.2 Business and Consumer Applications,

5.4.2.1 Social Networking
5.4.2.2 Media Applications
5.4.2.3 Multiplayer Online Gaming
5.4.2.4 CRM and ERP

COURSE CONTENTS

1. **Introduction to Cloud Computing**
   Recent Trends in Computing, History of Cloud Computing,
   Features, Principles and Challenges of Cloud Computing, Cloud Service Providers
   Advantages and Disadvantages of Cloud Computing, Compare Cluster Computing, Grid Computing, Distributed Computing, Utility Computing and Cloud Computing

2. **Parallel and Distributed Computing**
   Eras of Computing, Concepts of Parallel Computing, Concepts of Distributed Computing, Parallel Vs Distributed Computing

3. **Virtualization**
   Introduction, Characteristics of Virtualized environments, Classification of Virtualization Techniques, Role of Virtualization in Cloud Computing, Pros and Cons of Virtualization
   Virtualization Technologies – Examples (Xen, VM ware, Microsoft Hyper-V)

4. **Cloud Computing Architecture**
   Cloud Reference Model – Architecture, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS)
   Types of Clouds(Deployment models)– Public Clouds, Private Clouds, Hybrid Clouds and Community Clouds.
   Economics of Cloud

5. **Cloud Security and Applications**
   Security, Privacy and Trust
   Infrastructure Security, Data Security, Cloud applications.

REFERENCES

1. Cloud Computing : Principles and Paradigms – Rajkumar Buyya, James Broberg and Andrzej Goscinski
2. Mastering Cloud Computing – Rajkumar Buyya, Christian Vecchiola, S.Thamarai Selvi
3. Cloud Security and Privacy – Tim Mather, Subra Kumaraswamy, Shahed Latif
4. First Steps in Cloud Computing – Navin Sabharwal, Ravi Shankar

JAVA PROGRAMMING LAB PRACTICE

Subject Title	**:**	**Java Programming lab**
Subject Code	**:**	**CM – 507**
Periods per Week	**:**	**04**
Periods per Semester	**:**	**60**

List of Exercises

1. Write programs using Java built-in functions using all data types.
2. Write programs using conditional statements and loop statements.
3. Write a program to read data from keyboard.
4. Write a program to create class and objects.
5. Write programs using constructors.
6. Write a program to illustrate usage of command line arguments.
7. Write programs using concept of overloading methods.
8. Exercise on inheritance.
9. Write a program using the concept of method overriding.
10. Exercise on importing packages.
11. Exercise on interfaces.
12. Exercise on exception handling.
13. Exercise on multithreading and thread priorities.
14. Exercise on applets.

Objectives and key competencies.

Exp. No.	Name of the experiment	Objectives	Key Competencies
1	Write programs using Java built-in functions using all data types.	(a) Write programs using the primitive data types. (b) Display the data.	(a) Identify the data types. (b) Use println() method. (c) Compile the program. (d) Rectify the errors. (e) Observe the output.
2	Write programs using conditional statements and loop	(a) Write program using if statement. (b) Write program using	(a) Identify the differences between C, C++ and Java. (b) Compile the program and rectify the

	statements.	while, do and for constructs.	errors. (c) Observe the output.
3	Write a program to read data from keyboard.	(a) Write a program to give values to variables interactively through the keyboard. (b) Write program using different data types.	(a) Use different data types. (b) Use readLine() method. (c) Use println() method. (d) Observe the output.
4	Write a program to create class and objects.	(a) Write a program to create a class and create objects. (b) Write a program to create class and access class members.	(a) Create class. (b) Declare methods. (c) Create objects. (d) Write main method. (e) Access class members.
5	Write programs using constructors.	(a) Write a program using default constructor. (b) Write a program using parameterized constructor.	(a) Declare and define constructor. (b) Call default constructor. (c) Call parameterized constructor.
6	Write a program to illustrate usage of command line arguments.	Write a program to illustrate usage of command line arguments.	(a) Use command line arguments. (b) Run the program. (c) Observe the output.
7	Write programs using concept of overloading methods.	(a) Write a program to illustrate method overloading. (b) Write a program to illustrate method overloading using constructors.	(a) Observe method overloading. (b) Overload constructor methods.
8	Exercise on inheritance.	Write a program to illustrate single inheritance.	(a) Create base class. (b) Write base class constructor. (c) Create derived class. (d) Use *extends* keyword. (e) Use *super* keyword. (f) Write derived class constructor.
9	Write a program using the concept of method overriding.	Write a program using the concept of method overriding.	(a) Use method overriding. (b) Use *this* keyword.
10	Exercise on importing packages.	Write a program to create and use a package.	(a) Create package. (b) Use of access specifiers. (b) Use package. (c) Use *import* keyword.
11	Exercise on interfaces.	Write a program to illustrate multiple inheritance using interfaces.	(a) Define interface. (b) Use *extends* keyword. (c) Use *implements* keyword. (d) Access interface variables.
12	Exercise on	(a) Write a program to	(a) Use try – catch.

	exception handling	illustrate exception handling. (b) Write a program to illustrate exception handling using multiple catch statements.	(b) Use multiple catch blocks. (c) Use finally statement.
13	Exercise on multithreading and thread priorities.	(a) Write a program to create a thread by extending the thread class. (b) Write a program to create a thread by implementing the runnable interface. (c) Write a program to illustrate thread priorities.	(a) Use *extends, new*. (b) Use run() and start() methods. (c) Observe thread execution. (d) Use *implements runnable* interface. (e) Use setPriority() and getPriority() methods.
14	Exercise on applets.	Write a program to create an applet.	(a) Use <applet>…</applet> tag. (b) Add applet to html file. (c) Run the applet.

LIFE SKILLS
(Common to all Branches)

Subject Title : Life skills
Subject Code : CM- 508
Periods per week : 03
Period per semester : 45

TIME SCHEDULE

Sl No.	Major Topics	No. of periods		
		Theory	Practical	Total
1.	Concept of life skills	03	00	03
2.	Enhancing self esteem	01	02	03
3.	Goal setting	01	02	03
4.	Positive attitude	01	02	03
5.	Managing emotions	1 1/2	4 1/2	06
6.	Stress management	1 1/2	4 1/2	06
7.	Time management	1/2	2 1/2	03
8.	Interpersonal skills	01	02	03
9.	Creativity	01	02	03
10.	Problem solving and Decision making skills	01	02	03
11.	Assertiveness	1 1/2	4 1/2	06
12.	Leadership skills &Team spirit	1 1/2	11/2	03
TOTAL		15 1/2	29 1/2	45

Note: No Written Examination
The students may be asked to Demonstrate 1 or 2 skills from unit 2 to unit 12.
Marks: Internal – 40; External - 60

OBJECTIVES

Upon the completion of the course the student shall be able to

1.0 Understand the concept of life skills
- 1.1 Define Life skills
- 1.2 Explain need and impact of Life skills programme

1.3 List the elements of Life skills
1.4 Identify the sources of Life skills

2.0 Understand the concept of Self esteem

2.1 Define the term self esteem
2.2 Explain the concept of self esteem
2.3 List the characteristics of High self esteem
2.4 List the characteristics of Low self esteem
2.5 Explain the advantages of High self esteem
2.6 Explain the behavior patterns of low self esteem
2.7 Explain the causes of Low self esteem
2.8 List the steps to build a positive self esteem

Practicals

Exp No	Exercise	Activity (Questionnaire / Game and Role play)
1.	Identifying the Behavior	• Identifying the behavior patterns of low self-esteem people.
2.	Practice Positive Self Esteem	• Steps to build a positive self esteem

3.0 Understand the concept of Goal setting

3.1 Define the term Goal
3.2 Explain the significance of Goal setting
3.3 Explain the following concepts
a) Wish b) Dream c) Goal
3.4 Explain the reasons for not setting goals
3.5 Explain the effective goal setting process
3.6 List the barriers to reach goals

Practicals

Exp No	Exercise	Activity
1	Differentiate among Wish, Dream and Goal	• Drawing a picture of Your Self/ Your Country/ Your Society after 10yrs. • Discussion: Setting Personal Goals • Story Telling • Identifying of barriers • Analysis of barriers • Overcoming Barriers

4.0 Practice positive attitude

4.1 Define Attitude
4.2 Explain the concept of positive attitude
4.3 Explain the concept of negative attitude
4.4 Explain the affects of negative attitude
4.4 Identify the attitude of self and peers
4.5 Explain the effect of peers on self and vice-versa.
4.6 List the steps to enhance positive attitude
4.7 Explain the strategies to enhance positive attitude

Practicals

Exp No	Exercise	**Activity** (Psychological Instrument/ Game & Role play**)**
1.	Identify Positive attitude	• To study & to identify the attitude of self and peers. • List & practice the strategies to enhance positive attitude.
2	Observe	• Positive attitudes of self and Peers • Negative attitudes of self and Peers
3	Practice Strategies to enhance Positive attitude	• Celebrating the success • Listing the successes

5.0 Practice managing emotions

5.1 Explain the concept of emotion
5.2 List the different types of emotions
5.3 Differentiate between positive and negative emotions
5.4 Identify the type of emotion
5.5 Explain the causes of different types of emotions.
5.6 Implement the methods to manage major emotions (anger / depression)
5.7 Define Emotional Intelligence.
5.8 Explain the method to enhance emotional Intelligence.

Practicals

Exp No	Exercise	**Activity** (Story / simulated situational act /GD & Role play)
1.	Identify the Type of Emotion	• To identify the type and to study the cause of the emotion.
2	Managing Emotions	• Managing major emotions -Anger and Depression

6.0 Practice stress management skills

6.1 Define Stress
6.2 Explain the concept of stress
6.3 List the Types of stress
6.4 Explain the causes of stress
6.5 Comprehend the reactions of stress
a) Physical b) Cognitive c) Emotional d) Behavioral
6.6 Explain the steps involved in coping with the stress by
a) Relaxation b) Meditation c) Yoga
6.7 Practice the stress relaxing techniques by the 3 methods.
a) Relaxation b) Meditation c) Yoga
6.8 Comprehend the changing personality and cognitive patterns.
6.9 Observe the changing personality and cognitive patterns.

Practicals

Exp No	Exercise	**Activity**(Questionnaire /Interview and practice)
1	Identify the type of stress	• To study & to identify the type and causes of stress.
2	Stress –Relaxation Techniques	• Practice some simple Stress –Relaxation Techniques, Meditation, Yoga.

7.0 Practice Time management skills

7.1 Define Time management.
7.2 Comprehend the significance of Time management.
7.3 Explain the strategies to set priorities.
7.4 List the steps to overcome barriers to effective Time management.
7.5 Identify the various Time stealers.
7.6 Explain the Time-Management skills.
7.7 List different Time-Management skills.
7.8 Comprehend the advantages of Time-Management skills.

Practicals

Exp No	Exercise	**Activity** (Group work and Games)
1	Identify Time stealers	• Assign a activity to different Groups –Observe the time of accomplishing the task, Identify the time stealers.
2.	Practice Time-Management skills	• Perform the given tasks- Games

8.0 Practice Interpersonal skills

8.1 Explain the significance of Interpersonal skills.
8.2 List the factors that prevent building and maintaining positive relationships.
8.3 Advantages of positive relationships.
8.4 Disadvantages of negative relationships

Practicals

Exp No	Exercise	**Activity**
1	Identify Relationships	• Positive Relationships, Negative Relationships – Factors that affect them- Through a story
2.	Practice Rapport building	• Exercises on Rapport building • Developing Correct Body Language

9.0 Understand Creativity skills

9.1 Define Creativity
9.2 List the synonyms like Invention , Innovatioin, Novelty
9.3 Distinguish between Creativity , Invention, innovation, and novelty
9.4 Discuss the factors that lead to creative thinking like observation and imitation , improvement etc.
9.5 Distinguish between Convergent thinking and divergent Thinking
9.6 Explain various steps involved in Scientific approach to creative thinking namely a) Idea generation b) Curiosity c) Imagination d)Elaboration e) Complexity

f). Abstract ion and simplification g). Divergent Thinking h) Fluency i). Flexibilty j).Persistance k).Intrinsic Motivation l).Risk taking m).Projection/empathy n).Originality o). Story telling p). Flow.
List the Factors affecting the creativity in Individuals.

9.7 Give the concept of Vertical thinking and lateral thinking.
9.8 Explain the importance of Lateral thinking.
9.9 Compare lateral thinking and Vertical thinking

Practicals

Exp No	**Exercise**	**Activity** (Games and Group work)
1	Observe any given object	• Identifying finer details in an object
2.	Imagine	• Imagining a scene • Modifying a story (introduce a twist) • Improving a product • Finding different uses for a product
3	Skills	• Making paper craft
4	Product development	• Brain storming session
5	Developing originality	• Come up with original solutions for a given problem

10.0 Understand Problem solving and decision making skills

10.1 Define a Problem
10.2 Analyze the performance problems
10.3 Categorize the problems
10.4 List the barriers to the solutions to problems.

Practicals

Exp No	**Exercise**	**Activity** (Brainstorming – checklist technique free association, attribute listing)
1	Gather the facts and Data and Organizing the information.	• Information gathering and organizing • Identifying the solutions to the problem • Identifying the barriers to the solutions • Zeroing on Optimum solution
2.	Problem solving	• Games on Problem solving

11.0 Understand Assertive and non Assertive behavior

11.1 List the 3 types of Behaviors 1. Assertive 2. Non assertive (passive) 3. Aggressive Behaviour 4.Submissive behaiviors
11.2 Discuss the personality of a person having above behaviours
11.3 Explain the usefulness of assertive behavior in practical situations.
11.4 Explain the role of effective communication in reflecting assertive attitude
11.5 Give examples of Assertive statements a) Assertive request b) assertive NO
11.6 Explain the importance of goal setting
11.7 Explain the method of Conflict resolution.
11.8 Discuss the methods of controlling fear and coping up with criticism.

Practicals

Exp No	**Exercise**	**Activity** (Simulated situational act)
1	Observation of behavior	• Identifying different personality traits from the body language
2.	Practicing assertiveness	• Write statements • Reaction of individuals in a tricky situation • Facing a Mock interview • Detailing the characteristics of peers • setting goals – Games like throwing a coin in a circle • Giving a feedback on a)Successful program b) Failed project • Self disclosure
3	Skills	• Dealing with a critic • Saying NO • Dealing with an aggressive person
4	Simulation	• Role play- skit 1. Assertive statements 2. goal setting 3. self disclosure

12.0 Practice Leadership skills

12.1 Explain the concept of leadership
12.2 List the Traits of effective leader
12.3 Distinguish between Managing and leading
12.4 List the 3 leadership styles
12.5 Compare the above styles of leadership styles
12.6 Discuss choice of leadership style
12.7 Explain the strategies to develop effective leadership.
12.8 Explain the importance of Decision making
12.9 Explain the procedure for making effective decisions.

Practicals

Exp No	**Exercise**	**Activity** (Games and Group work)
1	Observation	• Questionnaire
2.	Identification of a Leader	• Give a task and observe the leader • Discuss the qualities and his /her leadership style • Ask the other members to identify the leadership qualities • Reflection on the self
3	Skills	• Decision making – followed by discussion
4	Building Team spirit	• Motivation – Intrinsic and Extrinsic Training- Communication- Challenge

Competencies for Practical Exercises

S.No	Title	Competency
1.	Concept of life skills	• Explain need and impact of Life skills
2.	Enhancing self esteem	• Follow the steps to build a positive self esteem
3.	Goal setting	• Practice the effective goal setting process
4.	Positive attitude	• Practice the steps to enhance positive attitude. • Observe the effects of peers on self and vice-versa.
5.	Managing emotions	• Practice the steps to manage emotional intelligence • Identify different types of emotions • Exercise control over Emotions
6.	Stress management	• Practice stress management techniques
7.	Time management	• Practice Time management techniques
8.	Interpersonal skills	• Identify positive and Negative Relations
9.	Creativity	• Lead a small group for accomplishment of a given task. • Build positive relationships.
10.	Problem solving and decision making skills	• Identify the various Problem solving and decision making skills • Make appropriate Decision
11.	Assertive and non Assertive behavior	• Practice Assertive and non Assertive behavior
12.	Leadership skills	• Exhibit Leadership skills

COURSE CONTENT

1.0 Concept of life skills

Definition of life skills, Need and impact of life skills programme

2.0 Enhancing self esteem

Concept, Characteristics of high and low self esteem people, Advantages of high self esteem, Causes of low esteem- Identification of behavior patterns of low self esteem – Practice session of Questionnaire / Game -Steps to build a positive self esteem – Practice session of Role play

3.0 Goal setting

Significance of goal setting,Concepts of Wish, Dream, and Goal Identify Wish, Dream, and Goal and differentiate among them Reasons for not setting the goals, Barriers to reach goals,Identify Barriers Effective goal setting process & Practice Effective goal setting

4.0 Positive attitude

concept ,affects of negative attitude,attitude of self and peers,effect of peers on self and vice-versa, steps to enhance positive attitude,strategies to enhance positive attitude

5.0 Managing emotions

Problem-definition, performance problems ,Categorize the problems, barriers to the solutions to problems.

6.0 Stress management

concept of stress, Types of stress, causes of stress, reactions of stress, coping with the stress, stress relaxing techniques, changing personality and cognitive patterns

7.0 Time management

Definition, significance of various Time stealers, Time management, strategies to set priorities, steps to overcome barriers, Time-Management skills- its advantages.

8.0 Interpersonal skills

Significance of Interpersonal skills,positive relationships- Advantages, negative relationships- Disadvantages

9.0 Creativity

Definition, Invention, Innovation, Novelty,creative thinking , observation and imitation , improvement,Expertise ,skill, and motivation, components of Creativity ,Convergent thinking and divergent Thinking, various steps involved in Scientific approach to creative thinking namely , Factors affecting the creativity in Individuals, Vertical thinking and lateral thinking.

10.0 Problem solving and decision making skills

Definition, performance problems –analysis, categorizing,barriers to the solutions to problems.

11.0 Assertive and non Assertive behavior

Types of Behaviors – their characteristics, need for controlling and avoiding aggressive behaviors, making and refusing an assertive request – their evaluation, importance of goal setting, method of giving feed back.

12.0 Leadership skills

Concept , importance, Role of a Leader in an Organization, Traits of effective leader, Managing and leading, leadership styles-their Comparison, theories of leadership, strategies to develop effective leadership, importance of Decision making, concept of ethical leadership and moral development.

REFERENCES

1.Robert NLussier, Christopher F. Achua Leadership: Theory, Application, & Skill development: Theory, Application.

WEB DESIGNING LAB PRACTICE

Subject Title	**:**	**Web Designing Lab**
Subject Code	**:**	**CM - 509**
Periods per Week	**:**	**03**
Periods per Semester	**:**	**45**

LIST OF EXPERIMENTS

1. Create a HTML page that uses the tags like head, title, body etc.
2. Create a HTML page that uses frames and different presentation formats, colors.
3. Create a HTML page with a table consisting of a header, body and footer.
4. Create a HTML page with a form containing various controls.
5. Create a style sheet to set the background color, position and dimensions of a HTML element.
6. Create a simple XML file that contains student data.
7. Write JavaScript code using arithmetic operators.
8. Write JavaScript code to implement sorting.
9. Write JavaScript code that uses recursion.
10. Write JavaScript code that displays date in various formats.
11. Write PHP program using arithmetic operators.
12. Write PHP program to implement searching.
13. Write PHP program to perform various operations on a database table using functions.
14. Write a PHP program to set a cookie.

OBJECTIVES AND KEY COMPETENCIES

Exp. No.	Name of the experiment	Objectives	Key Competencies
1	Create a HTML page that uses the tags like head, title, body etc.	Create the HTML page with a title and some content in the body.	1) Identify the editor required for writing HTML 2) Add the tags with relevant content 3) Save the file 4) Open the file in a browser 5) Test the results
2	Create a HTML page that uses frames and different presentation formats, colors.	Create the HTML page with multiple frames so that content in each frame will have different format and colors.	1) Identify the tags for creating multiple frames 2) Add some content to the frames and use different formats, colors for each frame. 3) Save the file 4) Open the file in a browser 5) Test the results
3	Create a HTML page with a table consisting of a header, body and footer.	Create the HTML page with a table and that table should have a header, body and footer.	1) Identify the tags for creating the table 2) Add header, body and footer to the table. 3) Put some content in each section of table 4) Save the file 5) Open the file in a browser 6) Test the results
4	Create a HTML page with a form containing various controls.	Create the HTML page with a form and add some controls like textbox, label to the form.	1) Identify the tags to add a form and controls 2) Add the form and put some controls in it. 3) Save the file 4) Open the file in a browser 5) Test the results
5	Create a style sheet to set the background color, position and dimensions of a HTML element.	Create a style sheet which contains selectors to set the background color, position and dimensions of a HTML element.	1) Identify the editor required for creating CSS 2) Add selectors to set the background color, position and dimensions of an element. 3) Save the CSS file 4) Link the CSS file to a valid HTML page. 5) Save the HTML page 6) Open the HTML page in a browser 7) Test the results
6	Create a simple XML file that contains student data.	Create an XML file with some student information.	1) Identify the information to put in the XML file 2) Identify the editor for creating XML file 3) Add relevant tags and put the content 4) Save the XML file. 5) Open the XML file in a browser which had XML parsing capability. 6) Test the result and verify the information.

7	Write JavaScript code using arithmetic operators.	Write JavaScript code using arithmetic operators like calculation of simple interest.	1) Understand the significance of Client-side scripting. 2) Understand the process of combining JavaScript and HTML. 3) Create a HTML file. 4) Add HTML elements to read Principal, Rate of interest, Time period and to calculate Simple interest. 5) Write the logic for calculating Simple interest 6) Save the HTML file. 7) Open the HTML page in a browser 8) Test the results 9) Resolve the errors if any through debugging
8	Write JavaScript code to implement sorting.	Write JavaScript code to implement sorting like reading an array of 'n' numbers and sorting them in ascending order.	1) Create a HTML file 2) Add elements to read array and to sort. 3) Write the logic for sorting using iterative and conditional statements. 4) Save the HTML file. 5) Open the HTML page in a browser 6) Test the results 7) Resolve the errors if any through debugging
9	Write JavaScript code that uses recursion	Write JavaScript code that uses recursion like calculation of the factorial.	1) Create a HTML file 2) Add elements to read number and to calculate factorial. 3) Write the logic using recursion 4) Save the HTML file. 5) Open the HTML page in a browser 6) Test the results 7) Resolve the errors if any through debugging
10	Write JavaScript code that displays date in various formats.	Write JavaScript code that display date in various formats like DD-MM-YYYY, DD/MM/YYYY etc.	1) Create a HTML file 2) Write the logic to display date information 3) Save the HTML file. 4) Open the HTML page in a browser 5) Test the results
11	Write PHP program using arithmetic operators.	Write PHP program using arithmetic operators like calculation of radius of a circle	1) Understand the differences between server side and client side scripting. 2) Understand the process of installing PHP and requesting documents from web server. 3) Understand the process of combining PHP and HTML. 4) Create a PHP file 5) Add elements to read radius and to calculate area. 6) Write the logic using operators. 7) Save and Run the page. 8) Test the results 9) Resolve the errors if any through debugging
12	Write PHP program to implement searching.	Write PHP program to implement searching like reading an array of 'n' numbers and finding smallest among them.	1) Create a PHP file. 2) Add elements to read array and to find the smallest number. 3) Write the logic for sorting using iterative and conditional statements. 4) Save and Run the page. 5) Test the result

13	Write PHP code to perform various operations on a database table using functions.	Write PHP code to perform retrieval, insertion, modification and deletion of data in a database table using functions	1) Understand the process of connecting to database and execute commands. 2) Create a PHP file. 3) Add required elements to the page. 4) Write the logic to retrieve, insert, update and delete data in the table using functions. 5) Save and Run the page. 6) Test the result
14	Write a PHP program to set a cookie.	Write PHP code to create a cookie and put some information in it.	1) Understand the significance of cookies. 2) Create a PHP file. 3) Write the logic to create and set a cookie 4) Save and Run the page. 5) Test the result.

VI SEMESTER

FIELD PRACTICES

Subject title : Field Practices
Subject code : CM-510
Periods/week : 07
Periods/semester : 105

Rationale: Field practices subject is introduced as a substitute for industrial training. This course is aimed at imparting same skills a student would acquire in the industry during the initial training period. In other words, industry like environment is simulated in the institution during this course to prepare the students for industry.

TIME SCHEDULE

S.No.	Major Topics	Periods / week
1	Identification and familiarization of various components of computer system	7
2	Disassemble and Assemble a system as a whole	7
3	3.1 Installation and un-installation of various hardware devices 3.2 Video Conferencing using Skype	7
4	Installation of operating systems and other applications	7
5	Maintenance of computer system & UPS	7
6	Troubleshooting a PC	7
7	Networking – practice	7
8	Implementation of DOS commands in C language	7
9	Debugging a program – Expect the output for a given program before execution	7
10	Selection of appropriate programming language for solving a given problem	7
11	Enhancement of programming skills	7
12	Designing a web site – Requirement gathering and Analysis	7
13	Designing a website – Design and Coding	7
14	Designing a website – Test and Debug	7
15	Practicing Software project development activities	7

Every student should do the following professional tasks on daily basis

- Monitoring the performance of system regularly
- Turnoff the systems properly
- Should follow the ethics such as usage of pen drives without prior permission, misplacing of peripherals etc.,
- Backup of hard disk on a regular basis
- Use of hard disk cleanup and defragmentation utilities regularly
- Setup weekly updates for systems
- Setup a firewall and parental controls
- Updation of antivirus and antispyware software

Objectives:

On completion of the practice the student shall be able to practice and perform/implement at the institution/hostel/ nearby establishment along with the staff

1.0 Identification and familiarization of various components of computer system

1.1 Note down the system configuration.
1.2 Identification of various power and data cables.
1.3 Identification of mother board components.
1.4 Identification of SMPS, RAM, ROM, Processor and hard disk.
1.5 Note down the power specifications of mother board components.
1.6 Identification of different types of cards.
- Networking card
- Internal modem
- Video graphics card

1.7 Identification of different types of cables within a computer –
- IDE
- SATA
- PATA
- USB
- Ethernet cables

1.8 Identification of different types of ports within a computer –
- Serial port
- Parallel port
- HDMI port
- VGA port
- PS/2 port
- Games port
- Different types of USB ports
- Audio sockets
- Ethernet port
- IEC power connector

2.0 Disassemble and Assemble a system as a whole
2.1 List out all the parts inside a system in detail.
2.2 Disassemble all the parts of a system in a proper manner.
2.3 Assemble all the parts to a system as a whole.
2.4 Note down the time taken to do the above tasks and Repeat the above tasks twice..

3.0 Installation and uninstallation
3.1 Installation and un-installation of various hardware devices.
3.1.1 Modem
3.1.2 Printer
3.1.3 Scanner
3.1.4 Web Cam
3.2 Set up of video conferencing using Skype.

4.0 Installation of operating systems and other applications.
4.1 CMOS set up.
4.2 Formatting and partitioning hard drives in different formats.

4.3 Installation of Unix/Linux.
4.4 Installation of windows OS.
4.5 Creation and management of user accounts in windows XP / windows 7.
4.6 Installation of Anti-Virus Software and Removal of Virus.

5.0 Maintenance of computer system and UPS.
5.1 Installation of OS within a OS using virtual machine.
5.2 Cloning of hard disk.
5.3 Observing the operation of UPS
5.3.1 Observing the front panel of UPS.
5.3.2 Familiarization of different operating modes in UPS.
5.3.3 Record the voltage of each battery using multi-meter.

6.0 Troubleshooting a PC
6.1 Troubleshooting keyboard
6.1.1 Dead keys.
6.1.2 Keyboard doesn't work at all.
6.1.3 Continuous display of a character even after the key is released.
6.1.4 Display of wrong character.
6.2 Troubleshooting monitor
6.2.1 Adjusting the display settings.
6.2.2 Power LED does not go ON and no display.
6.2.3 Power LED is ON but no display.
6.2.4 Power LED is ON but monitor displays wrong character.
6.2.5 Rid of monitor screen flickering wavy lines.
6.3 Troubleshooting printer
6.3.1 Printer never leaves warm-up mode.
6.3.2 Paper jam message is displayed.
6.3.3 Printed data are distorted.
6.3.4 Cartridge / toner related issues.
6.3.5 DMP – print head moves back and forth but nothing prints.
6.3.6 Print self test works but printing from a computer application does not work.
6.4 Troubleshooting optical drives.
6.5 Troubleshooting LAN Problems.
6.6 Upgradation of ram and processor.
6.7 Recover of lost data on hard drive.

7.0 Networking – practice
7.1 Using crimping tool – student should be able to crimp the given UTP cable
7.2 Peer to peer connections –
7.2.1 Student should be able to connect two computer systems using a UTP cable.
7.2.2 Student should check for successful establishment of peer to peer connection.
7.2.3 Student should be able to transmit/receive a file.
7.3 LAN establishment
7.3.1 Student should be able to establish a LAN connection for a group of systems.
7.3.2 Student should be able to provide IP addresses for systems in a LAN.
7.3.3 Student should be able to connect all the systems in a LAN to the internet.
7.4 Sharing of resources through network
7.4.1 Student should be able to share a printer / scanner in a network.
7.4.2 Student should be able to share files in a network.
7.5 FTP for downloading and uploading files.

7.6 Installation and configuring proxy server.

8.0 Implementation of DOS commands in C language

8.1 Student should learn about DOS commands.

8.2 Student should develop a C program for implementing a given DOS command.

9.0 Debugging a program - Expect the output for a given program before execution

9.1 Find out the syntax and logical errors in the given program.

9.2 Correction of the code to meet the objectives of a program.

9.3 Expect the output for a given program.

10.0 Selection of appropriate programming language for solving a given problem

10.1 Student should be able to design an algorithm/flowchart for the given problem.

10.2 Student should be able to implement a program in C language.

10.3 Student should be able to implement a program in C++ language.

10.4 Student should be able to implement a program in Java language.

10.5 Student should prepare a report on time and space complexity for the programs developed in each language.

10.6 Student should be able to choose and justify the appropriate language for solving the given problem.

11.0 Enhancement of programming skills

11.1 Student should be able to analyze the given program.

11.2 Student should be able to reduce the lines of code if possible.

11.3 Student should be able to write alternate method, if any.

11.4 Student should be able to improve the efficiency of program choosing appropriate data types and data structure.

11.5 Student should give comments wherever required.

11.6 Student should prepare a report on changes made to the given program.

12.0 Designing a web site – Requirement gathering and Analysis

12.1 Student should collect the required data about the problem

12.2 Student should prepare a detailed “SRS document” and identify the functional and non-functional requirements.

12.3 Students should perform requirement validation and understand the problem.

12.4 Student should identify the data objects required for the website.

13.0 Designing a website – Design and Coding

13.1 Student should prepare a report stating the different tables to be created. and the relations to be established among them by referring to the data objects.

13.2 Student should normalize the tables and create the resultant tables in the database.

13.3 Design the work flow of web pages.

13.4 Design the layout of web pages.

13.5 Student should identify the best technology to develop the website with the given requirements.

13.6 Write code for designed web pages and provide appropriate links.

14.0 Designing a website – Test and Debug

14.1 Student should deploy the website created.

14.2 Student should connect the front end with back end.

14.3 Student should test and debug the project.

14.4 Student should prepare a report on errors encountered while implementing.

15.0 Practicing software project development activities

15.1 Interaction with client (mock drill) to collect requirements and note down the requirements of the project.

15.2 Discussion among skilled and experienced software engineers to analyze the scope of the project (preparation of scope document) (mock drill) and to recognize functional and non-functional requirements –preparation of SRS document.

15.3 Preparation of project schedule, risk analysis , task list and data flow diagrams.

15.4 Documenting internal design of software for the purpose of future maintenance.

15.5 Write the final project report and present seminar on the project.

INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP

Subject Title :INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP
Subject Code :CM-601
Periods/Week :04
Periods/Semester :60

Rationale: Industrial management Entrepreneurship subject is aimed at giving the concepts of Industry , its functioning and management to encourage the students to set up their own enterprise. including quality management.

TIME SCHEDULE and BLUE PRINT

Sl	Major Topics	No. of periods		Weightage of Marks	Short Answer Questions			Essay Questions		
		Theory	Practice		R	U	A	R	U	A
1	Principles of Management, Organisation structure and behaviour	10	5	26	1	1	0	1	1	0
2	Production, Materials Management, Marketing & Sales.	20	5	38	2	2	0	1	1	1
3	Introduction to ISO 9000 & T.Q.M.	8	2	26	1	1	0	1	1	0
4	Role of Entrepreneur and Entrepreneurial Development	7	3	16	1	1	0	1	0	0
	Total	**45**	**15**	**110**	**5**	**5**	**0**	**4**	**3**	**1**
				MARKS	**15**	**15**	**0**	**40**	**30**	**10**

R:Remembering type - 55 marks
U: Explaining type -45 marks
A: Application type - 10 marks
Total marks weightage- 110

OBJECTIVES

On completion of the study of the subject a student should be able to comprehend the following:

1.0 Explain the principles of management as applied to industry.

1.1 Define industry, commerce (Trade) and business.
1.2 Discuss the need for management.
1.3 Explain the evolution of management
1.4 Explain the principles of scientific management.
1.5 Explain functions of Management.
1.6 Differentiate between management and administration.
1.7 Explain types of ownerships
1.8 Differentiate types of ownerships.
1.9 Explain salient features of joint stock companies.
1.10 Explain the philosophy and need of organisation structure of an industry.
1.11 List types of organisation structures.
1.12 Explain line organisation and its advantages and disadvantages.
1.13 Explain the line and staff organisation.
1.14 List the advantages and limitations of line and staff organisation.
1.15 Explain functional organisation and its advantages & disadvantages.
1.16 Explain organisational behaviour.
1.17 Conduct job analysis.
1.18 Assess the incurring applicants.
1.19 Outline the selection process.
1.20 Explain the sources of manpower.
1.21 State motivation theories.
1.22 Explain Maslow's theory.

2.0 Explain the different aspects of production, Materials Management and Marketing & Sales

2.1 Differentiate and integrate production, planning and control.
2.2 Relate the production department with other departments.
2.3 State the need for planning and it's advantages.
2.4 Explain the stages of Production, planning and control.
2.5 Explain routing methods.
2.6 Explain scheduling methods.
2.7 Explain dispatching.
2.8 Draw PERT/CPM networks.
2.9 Identify the critical path.

3.0 Explain the concepts of materials and Market management

3.1 Explain the role of the materials in Industry.
3.2 Derive expression for inventory control.
3.3 Explain ABC analysis.
3.4 Define safety stock.
3.5 Define reorder level.
3.6 Derive an expression for economic ordering quantity.
3.7 Study Stores layout and duties of store keeper

3.8 List various material handling equipment
3.9 Explain the concept of cost.
3.10 List out the elements of cost.
3.11 Explain the concept of contribution.
3.12 Explain break-even analysis.
3.13 Explain marketing functions.
Explain the principles of Marketing management.

3.14 Explain Sales function.
3.15 List out market conditions.
3.16 Differentiate Sellers and Buyers' market.
3.17 Differentiate monopoly, oligarchy, and perfect competition.
3.18 Conduct market and demand surveys.
3.19 Differentiate product and production analysis.

4.0 Explain ISO 9000 & TQM.

4.1 Explain the concept of quality.
4.2 Describe the quality systems and elements of quality systems.
4.3 Discuss the principles of quality Assurance.
4.4 Discuss the Indian Standards on quality systems.
4.5 Discuss the evolution of ISO standards.
4.6 Discuss ISO standards and ISO 9000 series of quality systems.
4.7 State the constituents of ISO 9000 series of standards for quality systems.
4.8 State the outstanding features and drawbacks of ISO 9000 series of standards.
4.9 List the beneficiaries of ISO 9000.
4.10 Explain 5-S principles and ZERO DEFECT.

5.0 Explain the role of entrepreneur in economic development and in improving the quality of life.

5.1 Outline the concepts of Entrepreneurship.
5.2 Define the word entrepreneur.
5.3 Determine the role of Entrepreneurship.
5.4 Describe the profile of an entrepreneur.
5.5 Explain the requirements of an entrepreneur.
5.6 Outline the expectations of Entrepreneurship.
5.7 Determine the role of entrepreneurs in promoting Small Scale Industries.
5.8 Describe the details of current self-employment schemes.
5.9 Explain the method of product selection.
5.10 Explain the factors influencing the site selection.
5.11 Outline the methods of plant layout.
5.12 State the needs for a planned and co-ordinated effort.
5.13 State the importance of follow up.
5.14 List the financial assistance programmes.
5.15 List out the organisations that help an entrepreneur.
5.16 List features of demand survey.
5.17 List features of market survey.

COURSE CONTENTS

1. Principles of management, Organisation structure and Behaviour

Definitions of Industry, Commerce and Business. Evolution of - Types of ownership – Sole proprietorship, Partnership management theories. Principles of Scientific Management, functions of management. Difference of administration and managemen, Private limited, Public limited company, Industrial Cooperatives, Philosophy, types of Organisations, Line and Staff and functional organisations. Advantages and limitations - Effective organisation. Job analysis, Assessing applicants, selection, motivation, different theories – Maslow's theory.

2. Production, Materials Management and Marketing & Sales

Production, planning and control, relation with other departments, need for planning and advantages Routing, scheduling, despatching - PERT and CPM, - simple problems. Materials in industry, inventory control model, ABC Analysis - Safety stock, re-order, level, Economic ordering quantity – Cost, Elements of Cost, Contribution, Break even analysis, Stores layout, stores equipment, Stores records, purchasing procedures, purchase records,Sellers and Buyers markets - Marketing, Sales, Market conditions, monopoly, oligarchy, perfect competition, Pricing Policies. Market Survey, Product and production.

3. Introduction to ISO 9000 and TQM.

Concept of quality discussed by B. Crosby W. Edward, Deming, Joseph M. Jura Kooru Ishikawa, Genichi Taguchi, Shigco Shingo.Quality systems – Definitions of the terms used in quality systems like, quality policy, quality management, quality systems, quality control and quality assurance.Elements quality systems : Management responsibility, Quality system, contract review, design control, document control, purchasing, purchaser – supplied product, product identification and traceability, process control, Inspection and testing.Principles of quality assurance – Definition of quality assurance.Indian standards
on quality systems – Main features of IS 13999 : 1990, IS 14000 : 1990, IS 14004 : 1990, IS 14001: 1990, IS 14002 : 1990, IS 14003: 1990.Discuss the necessity of International standards – Evolution of ISO. **5-S** principles – importance – meaning – approach – benefits Various standards under ISO – Outstanding features of ISO 9000 series of standards – ISO 9000 Phenomenon ISO 9000 series of quality systems – Constituents of ISO 9000 series of standards for quality systems.Drawbacks of ISO 9000 series of standards, list the beneficiaries of ISO 9000 (Whom does ISO 9000 help).

4. Role of Entrepreneur & Entrepreneurial Development.

Concept, definition, role, expectation, entrepreneurship Vs Management, promotion of S.S.I. Self – employment schemes. Product selection, site selection, plant layout, profile and requirement, need for a planned and co-coordinated effort, following, Institutional support needed, Financial assistance programmes, Demand survey, Market survey.

REFERENCE BOOKS

1. Industrial Engineering and Management - by O.P Khanna
2. Production Management- by Buffa.
3. Engineering Economics and Management Science - by Banga & Sharma.
4. S.S.I Hand Book by S.B.P. Publishers.
5. Personnel Management by Flippo.
6. Industrial Management and Entrepreneruship by Zakria Baig.
7. Entrepreneurship – by NITTT&R, Chennai.

Advanced Java Programming

Subject Title **:Advanced Java Programming**
Subject Code **:CM – 602**
Periods per Week **:04**
Periods per Semester **:60**

Rationale: Advanced Java Programming subject is aimed at giving the concepts of advanced Java , to encourage the students to learn new features.

TIME SCHEDULE and BLUE PRINT

S.No	Major Topics	Periods		Weightage Of Marks	Short Questions			Essay Questions		
		Theory	Practice		R	U	A	R	U	A
1.	Concepts of AWT	03	02	13	1	0	0	0	0	1
2.	Event Handling	10	08	34	0	1	2	1	1	½
3.	Servlets	10	05	26	1	1	0	0	1	1
4.	Java Database Connectivity	06	04	16	1	1	0	0	0	1
5.	Java Server Pages	06	06	21	1	0	1	0	0	1½
	Total	**35**	**25**	**110**	**4**	**3**	**3**	**1**	**2**	**5**
				MARKS	**12**	**09**	**09**	**10**	**20**	**50**

R:Remembering type - 22 marks
U: Explaining type - 29 marks
A: Application type - 59 marks
Total marks weightage- 110

Objectives:

On completion of the study of the subject the student should be able to comprehend the following

1. Concepts of AWT

1.1 List and discuss AWT classes
1.2 Discuss about Window fundamentals-Container .Panel. Window. Frame. Canvas
1.3 Discuss working with frame windows-
1.4 Distinguish different Graphics controls.
1.5 Discuss working with color
1.6 Discuss Working with Fonts
1.7 Explain AWT controls and handlings -labels. buttons. checkboxes. lists. scrollbars. Text fields. text area. menus. dialog boxes.

2. Event Handling

2.1 Explain the Two event handling mechanisms.
2.2 Discuss about The Delegation event model- events. event sources and event Listeners.
2.3 List and explain event Classes
2.4 Explain various sources of events.
2.5 Describe event listener interfaces.
2.6 Explain mouse and keyboard events.
2.7 Differentiate between Adapter classes. Inner classes.

3. Servlets

3.1 Explain about The life cycle of a servlet.
3.2 Discuss about Java Servlet Development Kit
3.3 create a simple servlet.
3.4 Discuss Javax.servlet package.
3.5 Working with Reading Servlet Parameters.
3.6 Handling HTTP requests and responses

4. Java Database Connectivity:

4.1 Discuss about Loading driver
4.2 Explain how to establish a connection.
4.3 Discuss how to create statement
4.4 Implement Simple Application and execution query.
4.5 Discuss about Scrollable ResultSet.
4.6 Describe various transactions.
4.7 Discuss about Advanced JDBC.

5. Java Server Pages

5.1 Explain about JSP life cycle.
5.2 Learn about JSP Scripting Elements .
5.3 Steps in JSP page execution.
5.4 Directives and Actions.
5.5 Discuss about Implicit Objects .
5.6 Analyze the steps to Develop Forms.
5.7 Discuss JavaBeans.

COURSE CONTENTS

1. **Concepts of AWT:**
   AWT classes, Window fundamentals , working with frame windows, working with graphics, working with color, Fonts-AWT controls-labels, buttons, checkboxes, lists, scrollbars, Text fields, text area, menus, dialog boxes.

2. **Event Handling**
   Two event handling mechanisms, The Deligation event model, event Classes, Sources of events, event listener interfacse-Handling mouse and keyboard events, Adapter classes, Inner classes.

3. **Servlets**
   The life cycle of a servlet, Java Servlet Development Kit -create a simple servlet. Javax.servlet package, Reading Servlet Parameters, Handling HTTP requests and responses.

4. **Java Database Connectivity:**
   Simple Application ,Core Concepts , Drivers and Connections , Statements,, ResultSet, Advanced JDBC.

5. **Java Server Pages**
   Simple Application ,Core Concepts , JSP Scripting Elements , Directives and Actions, Implicit Objects , Forms, JavaBeans.

Reference Books:

01 “Programming in Java”, Sachin Malhotra, Sourab Choudary, Oxford
02 “The Complete reference Java”, Herbert Schilidt, Tata McGraw-Hill
03 Java Servlet & JSP Cookbook by Bruce W.Perry ,O’Reilly series.
04 “Professional Java Server Programming”, Wrox
05 “Code notes for J2EE EJB, JDBC, JSP, and Servlets”- Gregory Brill

SYSTEM ADMINISTRATION

Subject Title **:System Administration**
Subject Code **:CM – 603**
Periods per Week **:04**
Periods per Semester **:60**

Rationale: System Administration subject is aimed at giving the concepts of software administration, to encourage the students to learn new features.

TIME SCHEDULE and BLUE PRINT

S.No	Major Topics	Periods		Weightage Of Marks	Short Questions			Essay Questions		
		Theory	Practice		R	U	A	R	U	A
1.	Introduction to system administration	04	01	13	1	0	0	1	0	0
2.	Windows-2008 server environment	08	02	21	1	1	0	0	1	0.5
3.	Windows-2008 server administration	10	05	26	1	1	0	1	1	0
4.	Introduction to LINUX	06	04	16	1	1	0	1	0	0
5.	LINUX Administration	15	05	34	1	1	1	1	1	0.5
	Total	**43**	**17**	**110**	**5**	**4**	**1**	**4**	**3**	**1**
				MARKS	**15**	**12**	**03**	**40**	**30**	**10**

R:Remembering type - 55 marks
U: Explaining type - 42 marks
A: Application type - 13 marks
Total marks weightage- 110

Objectives:

On completion of the study of the subject the student should be able to comprehend the following

1.0 Introduction to system administration
1.1 Need for System Administration.
1.2 History of System Administration,.

1.2.1 Responsibilities of System Administrator
1.3 History of Windows and Unix/Linux
1.3.1 Comparison between Windows and Linux
1.4 Implement Hard drives portioning
1.5 Discuss about various configurations like TCP/IP, DNS, DHCP, Domain, NetBEUI
1.6 Explain System security through firewalls, anti-virus software, passwords.

2.0 Windows-2008 server environment

2.1 Need for Windows server 2008
2.2 Different editions of windows 2008
2.3 Comparison between Windows NT and windows 2008
2.4 Comparison between various versions of Windows 2008server
2.5 List and explain Windows 2008 Server components
2.6 List various Hardware requirements.
2.7 List Major optional services available in Windows 2008 server.

3.0 Windows-2008 server administration

3.1 Analyze the Installation & Configuration of Windows 2008 Server
3.2 Discuss User & Group Managements.
3.3 Analyze the working of Device Manager, Drivers Signing & Signature
3.4 analyze Verification & Managing Ports.
3.5 Implement the Installing & Managing & Configuration Printers,
3.6 Discuss Disk Management Tools & Tasks,
3.7 Describe File Systems User Management.
3.8 Implementing Files and Folder NTFS & Share Permissions.
3.9 Explain Managing Servers Remotely Using Terminal Services (Remote Desktop).
3.10 Describe Remote Access and VPN Overview, Configuring & Implementing RemoteAccess Server.
3.11 Implementing & Configuring VPN.
3.12 Implementing & Configuring Active Directory Services Forest.
3.13 Implementing Server Roles, Restoring Active Directory.

4.0 Introduction to LINUX

4.1 Introduction to Linux, pre-Installation.
4.2 Analyze Installation of Linux.
4.3 Discuss Desktop Environments, Shells & their Types.
4.4 Familiarization with LINUX editors and commands
4.5 Discuss basic filtering techniques in LINUX
4.5.1 Give the working of filter commands
4.5.2 Discuss the usage of grep, egrep, fgrep.

5.0 LINUX Administration

5.1 Discuss about Managing Users and Groups
5.2 Explain the process of Managing Printers and print job.
5.3 Explaining Browsers, PPP & Time Management using TCP/IP with LINUX.
5.4 Analyze the process of Configuring DHCP in LINUX

5.5 Describe Configuring DNS in LINUX.
5.6 Discuss Samba, NFS, Network Services, Proxies, Configuring Firewall.
5.7 Configuring internet access, sending mail
5.8 Configuring web server.
5.9 Describe Linux Security
5.10 explain the process of Backup of data in Linux

COURSE CONTENTS

1. **Introduction to system administration:**
   Introduction, System Administration, History of System Administration, System Administrator Roles, History of Windows and Unix/Linux, Hard drives (types/partitioning), Networking (TCP/IP, DNS, DHCP, Domain, NetBEUI), System Security (firewalls, anti-virus software, passwords).

2. **Windows-2008 server environment:**
   Need for Windows 2003, Comparison between NT and windows 2003, Server Components, Hardware requirements, Optional services

3. **Windows-2008 server administration:**
   Installation & Configuration of Windows 2008 Server, User group Management, Disk Management, Active Directory, Distributed File system, Remote Terminal Services, Networking with Windows 2008 Server, Domain Name system (DNS), DHCP, Installation of IIS, VPN, Restoring, Domain Security.

4. **Introduction to LINUX:**
   Installation of LINUX, Desktop Environment, Linux editors and commands, filtering techniques.

5. **LINUX Administration:**
   Managing users and groups, managing printers, configuring DHCP , DNS, Network services, Firewalls, Security, backup

Reference Books

1. "Teach Yourself MCS TCP/IP", James F. Causey, Techmedia
2. "Introduction to UNIX and LINUX ",John Muster, TMH Pubs
3. "Linux Administration : a Beginner's Guide", Wale Soyinka, *McGraw Hill.*

DATA COMMUNUCATION

Subject Title : DATA COMMUNICATION
Subject Code :CM – 604
Periods per Week :04
Periods per Semester :60

Rationale: Data Communication subject is aimed at giving the concepts of communication , to encourage the students to learn new features.

TIME SCHEDULE and BLUE PRINT

S.No	Major Topics	Periods		Weightage Of Marks	Short Questions			Essay Questions		
		Theory	Practice		R	U	A	R	U	A
1.	Basics of data communication	08	02	16	1	1	0	1	0	0
2.	Communication hardware Data	06	02	13	1	0	0	1	0	0
3.	Transmission and Media	10	02	26	1	1	0	1	1	0
4.	Signal Encoding Techniques	12	03	29	1	1	1	1	0	1
5.	Multiplexing and Switching techniques	10	05	26	1	0	1	1	1	0
	Total	**35**	**25**	**110**	**5**	**3**	**2**	**5**	**2**	**1**
				MARKS	**15**	**09**	**06**	**50**	**20**	**10**

R:Remembering type - 65 marks
U: Explaining type - 29 marks
A: Application type - 16 marks
Total marks weightage- 110

Objectives:

On completion of the study of the subject the student should be able to comprehend the following

1.0 Basics of data communication

1.1 Discuss information, data, need for data communication
1.2 Study about data communication model along with block diagram and basic components
1.3 Discuss about band width, communication rate, and maximum data rate of transmission media
1.4 List and explain about modes of data transmission.

1.5 Discuss about point-to-point, multipoint and broad casting communication
1.6 Differentiate point-to multipoint-non broadcasting and point-to-multipoint-broadcasting

2.0 Communication hardware Data

2.1 Differentiate t adapter, modem and their functions.
2.2 Discuss about internal modem and external modem.
2.3 Explain the working principle of modem.
2.4 Describe the operation of direct connect modem.
2.5 Discuss the operation of acoustical modem connection to the telephone line.

3.0 Transmission and Media

3.1 List the types of data representations and communication
3.2 Describe transmission Impairments.
3.3 Define Channel Capacity.
3.4 Differentiate between an analog and a digital electromagnetic signal.
3.5 List three important characteristics of a periodic signal.
3.6 How many radians are there in a complete circle of 360 degrees.
3.7 Define the relationship between the wavelength and frequency of a sine wave.
3.8 Define fundamental frequency
3.9 Differentiate the relationship between a signal's spectrum and its bandwidth.
3.10 Define attenuation.
3.11 List the key factors affect channel capacity.
3.12 List and explain different data transmission media.
3.13 Differentiate between guided media and unguided media.
3.14 Discuss about Wireless Propagation-Line-of-Sight Transmission.

4.0 **Signal Encoding Techniques**

4.1 Discuss about modulation and demodulation
4.2 Define differential encoding.
4.3 Differentiate between NRZ-L and NRZI including the signals
4.4 Describe two multilevel binary digital-to-digital encoding techniques.
4.5 Analyze the modulation techniques for transforming digital-data into digital signals.
4.6 Explain modulation techniques for transforming digital-data into analog signals.
4.7 Explain modulation techniques for transforming analog-data into digital signals.
4.8 Explain modulation techniques for transforming analog-data into analog signals.
4.9 Define a parity bit.
4.10 Describe synchronous and asynchronous transmission with frame formats.
4.11 List the disadvantage of asynchronous transmission.

4.12 Discuss about types of errors
4.13 Explain error detection techniques like CRC, Parity check
4.14 Explain error correction process.

5.0 **Multiplexing and Switching techniques**
5.1 Define Multiplexing,
5.2 Discuss about Frequency-Division Multiplexing(FDM),
5.3 Discuss about Synchronous Time-Division Multiplexing,
5.4 Discuss about Statistical Time-Division Multiplexing.
5.5 Define upstream and downstream with respect to subscriber lines.
5.6 Discuss why is a statistical time division multiplexer more efficient than a synchronous time division multiplexer.
5.7 Discuss about switched communication network.
5.8 List and explain about of switching network techniques.
5.9 List the advantages of packet switching compared to circuit switching.
5.10 Compare circuit switching and packet switching
5.11 Define frame relay.

COURSE CONTENTS

1. **Basics of data communication**
   Define Information and data, **Data** communication, need of data communication. Elements of data communication model -source, transmitter, transmission media, receiver and destination. Band width and communication rate of transmission media, Calculating maximum data rate of a of transmission media. Modes of transmission- simplex, half-duplex and full-duplex, Transmission paths - point-to-point, multipoint, broad casting.

2. **Communication hardware**
   Function of communication adapter and modem, features of internal and external modem, Operation of direct connect modem & acoustical modem connection to the telephone line.

3. **Data Transmission and Media-** Types of data and communications - digital and analog, serial and parallel communications, Transmission Impairments, Channel Capacity. Transmission Media**-**Guided Transmission Media, Wireless Transmission, Wireless Propagation-Line-of-Sight Transmission.
4. **Signal Encoding Techniques- -** Digital Data-Digital Signals(NRZ-L,NRZI, Bipolar-AMI, Manchester)-, Digital Data- Analog Signals(ASK,PSK,FSK and QAM), Analog Data-Digital Signals(PCM,DM), Analog Data- Analog Signals(AM,FM and PM). Digital Data Communication Techniques - Asynchronous and Synchronous Transmission, Types of Errors, Error Detection, Error Correction.

5. **Multiplexing and Switching techniques -**Frequency-Division Multiplexing(FDM), Synchronous Time-Division Multiplexing, Statistical Time-Division Multiplexing(TDM), Asymmetric Digital Subscriber Line. Circuit Switching Networks, Packet-Switching Principles, Frame Relay.

Reference Books:

1. Data and Computer Communications - William Stallings
2. Data and computer communications - Behrouz a. Forouzan
3. Computer netweorks - tannenbaum

.NET PROGRAMMING

Subject Title : .NET PROGRAMMING
Subject Code :CM – 605
Periods per Week :04
Periods per Semester :60

Rationale: .Net Programming subject is aimed at giving the concepts of .Net , to encourage the students to learn new features..

TIME SCHEDULE and BLUE PRINT

S.No	Major Topics	Periods		Weightage Of Marks	Short Questions			Essay Questions		
		Theory	Practice		R	U	A	R	U	A
1.	Basics of .NET Framework.	05	02	16	1	0	1	1	0	0
2.	C# Fundamentals	10	10	34	1	1	1	1	0.5	1
3.	ADO.NET	10	05	21	1	1	0	1	0.5	0
4.	Window Applications	06	04	23	0	0	1	0	1	1
5.	Web Applications	06	02	16	1	0	1	1	0	0
	Total	**37**	**23**	**110**	**4**	**2**	**4**	**4**	**2**	**2**
				MARKS	**12**	**06**	**12**	**40**	**20**	**20**

R:Remembering type - 52marks
U: Explaining type - 26marks
A: Application type - 32 marks
Total marks weightage- 110

Objectives:

On completion of the study of the subject the student should be able to comprehend the following

1 **Basics of .NET Framework.**
1.1 Define .NET Framework.
1.2 List the features of .net framework.
1.3 Draw and explain CLR architecture
1.4 Discuss about frame work class Library .
1.5 Define Microsoft intermediate language
1.6 Discuss Common type system CTS, common type language CTL.
1.7 List .NET languages.
1.8 List the Advantages of .net over C, C++, Java.
1.9 Introduction to C#.NET .

1.10 Describe Integrated development environment in c#.net.
1.11 Describe C#.NET working Environment and browse through menus on the menu bar.
1.12 Explain the help system.
1.13 List the applications of .net.

2 C# Fundamentals:
2.1 Analyze variables, constants declarations and their types.
2.2 Discuss various operators.
2.3 Describe classes and objects.
2.4 Discuss user defined data types, scope of variables, life of variables.
2.5 Discuss various type conversions,
2.6 Define array and Develop small projects using Arrays .
2.7 Describe control flow statements like two directional, multi directional flow statements.
2.8 List various loop statements and explain.
2.9 Develop small projects using control flow statements.
2.10 Implement OOPs concepts.
2.11 Discuss recursion concept.
2.12 Explain Exception Handling.
2.13 Analyze debugging and execution.

3 ADO.NET.
3.1 Introduction to ADO.NET
3.2 Discuss data objects.
3.3 Describe how to connect data base to c# application through server explorer.
3.4 Explain the process of Accessing data with data adapters and data sets.
3.5 Explain Multiple Table Connection.
3.6 List the features and advantages with ADO.NET.

4 Window Applications.
4.1 Discuss the designing aspects of C#.NET windows application forms.
4.2 List the steps for creating a windows application
4.3 List various elements of user interface.
4.4 Discuss the properties of controls like text box, label , button, check box, radio button, combo box, list box, data grid.
4.5 Explain the design process of a simple form and display the messages using the above controls.
4.6 List and discuss the common properties of above controls.
4.7 Describe how to enable, disable the controls and run the applications.
4.8 Explain the steps to creation of Menus at design time using the menu design window.
4.9 Develop a project to control menus at run time.
4.10 Explain how to create short cut keys for pull down menus.
4.11 Describe common dialogue control.
4.12 Discuss about fundamentals of graphics controls like line and shape.
4.13 Explain the process of connecting database.
4.14 Describe navigating data source.
4.15 Discuss about Data Grid View,
4.16 Define Data validation.
4.17 Explain about designing and coding simple form.
4.18 Discuss about the deploying and distribution of windows application.

5 Web Applications.

5.1 Introduction to Web Forms.
5.2 Discuss the steps for creating a web application
5.3 Describe the usage of text box, label, button, check box, radio button, drop down list, list box, data grid, hyperlink, images, panel, hidden field.
5.4 Discuss about Data Grid View,
5.5 List and describe various Data validation controls.
5.6 Explain the process of passing data between two web forms.
5.7 Explain the process of designing and coding simple form.
5.8 Explain how to deploy and distribute a web application.

COURSE CONTENTS

1. **Basics of .NET Framework:**
   Introduction to .NET Framework, Features of .net, Common Language Runtime, Framework Class Library, Name space, common type system, common language specification, execution process of . net program, JIT, MSIL, assembly, Garbage Collection, Advantages of .net over C, C++, Java. Understanding Visual Studio IDE. Know about the help system, applications of .net.

2. **C# fundamentals:**
   Introduction to C# , Features, Advantages, data types, value type, reference type, variables, constants, operators, data type conversions, Classes & Objects, interface, Arrays & Collections , oops features, conditional statements, iterative statements, exception handling, writing C# console program, debugging and executing program.

3. **ADO.NET :**
   Overview of ADO.NET model , Data objects : Connection Object, Command Object, Data Readers, Data Sets & Data Adapters , working with MS-Acess and Oracle Database. Features and Advantages of ADO.NET

4. **Window Applications:**
   Steps for creating a window application, working with various controls- text box, label , button, check box, radio button, combo box, list box, data grid, common dialog controls, creating and working with menus, distributing the windows application, database connecting, fundamentals of graphics and Graphic controls, simple designing and coding**.**

5. **Web Applications:**
   Steps for creating a web application, working with various controls- text box, label , button, check box, radio button, drop down list, list box, data grid, hyperlink, images, panel, hidden field, data validation controls, passing data between two web forms, deploying and distributing a web application.

REFERENCE BOOKS:

1. Programming in C#: A Primer",Balaguruswamy, McGraw-Hill.
2. C# A Beginner's Guide",Herbert Schildt, McGraw-Hill.
3. Learning C#",Jesse Liberty and Brian MacDonald, O'Reilly
4. Pro C# and the .NET Framework",Andrew Troelsen, Apress
5. Mastering Visual C# .NET",Jason Price & Mike Gunderloy, Publisher: Wiley

CRYPTOGRAPHY AND NETWORK SECURITY

Subject Title : CRYPTOGRAPHY AND NETWORK SECURITY
Subject Code :CM – 606
Periods per Week :04
Periods per Semester :60

Rationale: Cryptography and network security subject is aimed at giving the concepts of Security levels , to encourage the students to learn new features.

TIME SCHEDULE and BLUE PRINT

S.No	Major Topics	Periods		Weightage Of Marks	Short Questions			Essay Questions		
		Theory	Practice		R	U	A	R	U	A
1.	Introduction to Network security	08	02	21	1	1	0	1	0.5	0
2.	Classical Encryption Techniques	10	10	34	1	1	1	1	1	0.5
3.	Cryptographic integrity techniques	10	05	26	1	1	0	1	1	0
4.	System security	06	02	16	1	1	0	1	0	0
5.	Firewalls and Ethical Issues	05	02	13	1	0	0	1	0	0
	Total	**39**	**21**	**110**	**5**	**4**	**1**	**5**	**2.5**	**0.5**
				MARKS	**15**	**12**	**03**	**50**	**25**	**5**

R:Remembering type - 65 marks
U: Explaining type - 37 marks
A: Application type - 08 marks
Total marks weightage- 110

Objectives:

On completion of the study of the subject the student should be able to comprehend the following

1. Introduction to Network security
1.1 Define security and network security.
1.2 Describe OSI security architecture.
1.3 Discuss about different security goals.
1.4 Define cryptography.
1.5 Discuss about crypto system.
1.6 Discuss about authentication, Confidentiality, integrity w.r.t data.

1.7 Differentiate passive and active security threats.
1.8 List and explain categories of passive and active security attacks.
1.9 List and explain categories of security services.
1.10 List and explain categories of security mechanisms.
1.11 Draw the Model for network security and explain.

2. Classical Encryption Techniques
2.1 Define encryption and decryption
2.2 List the essential ingredients of a symmetric cipher.
2.3 Describe two basic functions used in encryption algorithms.
2.4 List keys required for two people to communicate via a cipher.
2.5 Describe the general approaches to attacking a cipher.
2.6 Discuss the Caesar cipher.
2.7 Discuss the monoalphabetic cipher.
2.8 Describe Playfair and Hill ciphers.
2.9 Discuss One-Time-Pad.
2.10 Differentiate mono and polyalphabetic ciphers.
2.11 Discuss the problems with the one-time pad.
2.12 Define a transposition cipher.
2.13 Defne steganography.
2.14 Exercise all the ciphers with examples.

3. Cryptographic integrity techniques
3.1 List the principal elements of a public-key cryptosystem.
3.2 List the roles of the public and private key.
3.3 Discuss about message authentication.
3.4 List and explain message authentication requirements.
3.5 List the message authentication functions.
3.6 Discuss about the message authentication code.
3.7 Differentiate between hash function and cryptography Hash function.
3.8 List the applications of cryptographic hash functions.
3.9 Define digital signature.
3.10 List the properties of a digital signature should have.
3.11 List the digital signature requirements.

4. System security
4.1 Discuss about Intruders, intrusion detection, password management
4.2 Discuss about malicious software like Backdoor, Logic Bomb, Trojan Horses, Mobile Code, Multiple-Threat Malware
4.3 Define virus and warm.
4.4 Discuss about Virus, Virus Nature,Virus Classification,Macro Viruses, Virus Kits,E-Mail Viruses
4.5 Discuss about Virus Countermeasures: Antivirus Approaches, Advanced Antivirus Techniques
4.6 Discuss about Morries worm, worm attacks, worm technologies, mobile phone worms,
4.7 Describe how does a worm propagate.

4.8 Discuss about worm Countermeasures

5. Firewalls and Ethical Issues

5.1 Define Firewall.
5.2 List types of firewalls.
5.3 Discuss about firewall characteristics
5.4 Analyze the importance of firewall
5.5 Discuss about cyber crime and computer crime,
5.6 Discuss the classification of computer crime based on the role that the computer plays in the criminal activity.
5.7 Explain digital rights management
5.8 List the basic conditions that must be fulfilled to claim a copyright.
5.9 Describe the principal categories of users of digital rights management systems.

COURSE CONTENTS

1. **Introduction to Network security: S**ecurity, Need of Network security, security goals, cryptography, Attacks, Mechanisms and Services, The OSI Security Architecture: Security Services, Availability Services, Security Mechanisms and Security Attacks, A model for Network Security.

2. **Classical Encryption Techniques :** Symmetric Cipher Model, Substitution Techniques : Caesar Cipher, Monoalphabetic Cipher, Playfair Cipher, Hill Cipher, Monoalphabetic cipher, One-Time Pad, Transposition Techniques, Steganography.

3. **Cryptographic integrity techniques :** Principles of Public Key Cryptosystems, Authentication Requirements, Authentication Functions, Message Authentication Codes, Discussledge on Hash Functions and Digital Signatures.

4. **System security:** Intruders**,** Intrusion Detection, Password Management, Backdoor, Logic Bomb, Trojan Horses, Mobile Code, and Multiple-Threat Malware. Viruses: The Nature of Viruses, Viruses Classification, Virus Kits, Macro Viruses, E-Mail Viruses. Virus Countermeasures: Antivirus Approaches, Advanced Antivirus Techniques. Worms: Difference between virus and worm. The Morris Worm, Worm Propagation Model, Recent Worm Attacks, State of Worm Technology, Mobile Phone Worms, Worm Countermeasures, back-up and data recovery.

5. **Firewalls and Ethical Issues :** The Need for Firewalls**,** Firewall Characteristics, Types of Firewalls and their advantages. Legal and Ethical issues: Cybercrime and Computer Crime, Ethical Issues Related to Computers and Information Systems

REFERENCE BOOKS:

1. Cryptography and Network Security: Principles and Practices,- William Stallings - Pearson Education.
2. Cryptography and Network Security –Atul Kahate : Mc Graw Hill
3. Network Security Essentials (Applications and Standards)- William Stallings, Pearson Education.
4. Cryptography and Network Security : 2nd Edition - Behrouz a. Forouzan.
5. computer networking a top-down approach- James F. kurose & Keith W. Ross, Pearson Education.

Advanced JAVA Programming LAB

Subject Title : Advanced JAVA Programming LAB
Subject Code : CM – 607
Periods per Week : 04
Periods per Semester : 60

LIST OF EXCERCISES:

1. Menus using AWT
2. Create Applets.
3. Write a program in Java for handling Mouse events.
4. Write a program in Java for handling Keyboard events.
5. Write a program in Java to create and manipulate Text Area, Canvas, Scroll Bars, Frames
6. Exercise on database connectivity using JDBC
7. Exercise on simple servlet programs.
8. Write a java servlet program to read servlet parameters and send them into client page using HTTP requests and responses objects.
9. Server-side Scripting using Java Server Pages (JSP)
10. Web Page designing using database as a Back and JSP as front end.

Advanced Java Programming LAB		
Name of the Experiment	Objectives	Key Competencies
Exercises on AWT and Event Handling	Write a program for vii. Menus using AWT viii. Simple applets ix. event handling on Mouse events x. event handling on keyboard events	❖ Rectify syntactical errors ❖ Debug logical errors ❖ Study AWT structure ❖ Validate the memory allocation ❖ Study EVENT HANDLING in proper order
Write programs to implement Servlets	Write program for iv. Creation of servlets v. Servlet parameters.	❖ Correct syntactical errors ❖ Debug logical errors ❖ Validate whether the memory allocation is done ❖ Study servlets
Exercises on JDBC and JSP	Write a program for vi. Database connectivity JDBC vii. Client side scripting using JavaScript viii. Server side scripting using JSP ix. Webpage designing	❖ Correct syntactical errors ❖ Debug logical errors ❖ Observe JDBC connectivity ❖ Accessing server from client ❖ Study JSP ❖ Layout of Web page

SYSTEM ADMINISTRATION LAB

Subject Title	: System Administration LAB
Subject Code	: CM – 608
Periods per Week	: 04
Periods per Semester	: 60

LIST OF EXCERCISES:

1. Installing Linux/Windows-2008 server.
2. Practice on Linux commands.
3. Creating and managing user accounts in LINUX/Windows-2008 server.
4. Write and execute at shell programs in Linux using numbers.
5. Write and execute at shell programs in Linux using strings.
6. Write and execute at shell programs in Linux using arrays.
7. Lower case to upper case, string length, concatenating strings.
8. Installation of device drivers in LINUX/Windows-2008 server.
9. Configuration of DHCP in LINUX/Windows-2008 server.
10. Configuration of DNS in LINUX/Windows-2008 server.

SYSTEM ADMINISTRATION LAB		
Name of the Experiment	Objectives	Key Competencies
Exercises on Installation of Windows 2008 server and Linux	Learning Software Installing of i. Windows 2008 server ii. Linux	❖ Study software installation procedures ❖ Validate whether the memory allocation done ❖ Study problems of software installation
Exercises on System Administration of Creating and managing user accounts	Write procedure for Creation of user accounts Managing user accounts	Validate whether the memory allocation is done Study System Administration manuals Discuss user accessing rights.
Exercises on Linux Shell Programming, JDBC and JSP	Write a program for i. Shell programming ii. Database connectivity JDBC iii. Client side scripting using JavaScript iv. Server side scripting using JSP v. Webpage designing	❖ Analysis of Memory availability ❖ Study the syntax of Linux shell programming commands and control statements ❖ Study the concepts of JDBC ❖ Observe JDBC connectivity Study JSP ❖ Designing a client side web page ❖ Designing a server side web page ❖ Interacting client with server

.NET Programming Lab

Subject Title : .NET Programming Lab
Subject Code : CM – 609
Periods per Week : 03
Periods per Semester : 45

LIST OF EXCERCISES using C# :

1. Exercise on all basic controls in designing forms.
2. Design a calculator using appropriate commands.
3. Exercise on menus at design time and run time.
4. Exercise on modifying and deleting menu items.
5. Develop a project using arrays and control statements.
6. Develop a project using recursive concept.
7. Exercise on Line and Shape Controls.
8. Exercise on web forms using appropriate control elements.
9. Exercise on web forms using images , hyperlinks.
10. Exercise on data accessing in ADO.NET with multiple tables.

11.

.NET Programming Lab		
Name of the Experiment	Objectives	Key Competencies
Exercises on designing forms	Learning forms of i. .NET Framework ii. Visual Studio IDE iii. Help System	❖ Study the creation of forms ❖ Validate whether the memory allocation ❖ Study the basics of IDE and help system ❖ Familiar with Framework.
Exercises on menu items	Write procedure for i. Creation of Menus ii. Managing Menus	❖ Validate whether the memory allocation is done ❖ Study of Menu items ❖ Analysis of menus at designing time and run time
Exercises on C# Programming, Graphical controls Web forms ADO.NET	Write a program for i. Using C# control statements ii. Grapical controls iii. Web Forms iv. ADO.NET	❖ Analysis of Memory availability ❖ Study the syntax of C# programming commands and control statements. ❖ Study the concepts of various line and shape controls ❖ Study data accessing in ADO.NET with multiple tables. ❖ Familiar in developing websites using web forms, images and hyperlinks. ❖ Learning data base connection to the .net application.

PROJECT WORK

Subject Title : PROJECT WORK
Subject Code : CM – 6*10*
Periods per Week : 07
Periods per Semester : 105

SHOULD BE IN THE FOLLOWING AREAS:

1. SOFTWARE PROJECTS
    a. Web site designing
    b. Banking
    c. Income tax calculation package
    d. Examinations cell.
    e. Student database management
    f. Library management
    g. Stores Management
    h. Staff data management
    i. Payrolls
    j. Inventory Control
    k. Hostel management
    l. Tourism package
    m. Institution management softwares
    n. Anti-Virus software development.
    o. Folder-locking.
    p. Terminate stay resident systems.

2. HARDWARE and NETWORKING PROJECTS
    a. LAN establishing
    b. Using interfacing devices
    c. Voice synthesizer
    d. Voice recognizer
    e. Printer sharer
    f. ADD ON cards or any relevant

3. SOFTWARE AND HARDWARE PROJECTS
    b. Using interfaces, microcontrollers. Microprocessors and PCs
    c. Inter-cum
    d. Assembling computer along with peripherals.
    e. Traffic light controller
    f. Stepper motor related
    g. Lift controllers
    h. Level controllers
    i. Temperature controllers