



**GOVERNMENT OF KERALA
DEPARTMENT OF TECHNICAL EDUCATION**

**CURRICULUM DEVELOPMENT CENTRE
KALAMASSERY**

**CURRICULUM OF
DIPLOMA COURSE**

IN

COMPUTER ENGINEERING

**SEMESTER SYSTEM
(Revision 2006)**

**Prepared at
CURRICULUM DEVELOPMENT CENTRE, KALAMASSERY**

RULES AND REGULATIONS OF THE DIPLOMA COURSES
IN ENGINEERING/TECHNOLOGY/COMMERCIAL PRACTICE
UNDER THE STATE BOARD OF TECHNICAL EDUCATION,
KERALA STATE. (SEMESTER SYSTEM)

01. Duration of the Diploma Course

The duration of the regular Diploma courses will be of three academic years, consisting of Six (6) consecutive semesters. The first 2 Semesters are combined and run on an year pattern, and called “Combined First and Second Semesters”.

02. Medium of Instruction

The medium of instruction in all the theory and practical subjects shall be English.

03. Eligibility for Selection to the Diploma Course

Candidates for admission shall be required to have passed Xth class examination (S.S.L.C.) conducted by the Board of Public Examinations, Kerala State or any other equivalent examinations already recognized by the Board of Public Examinations, of Kerala State, with the eligibility for Higher Education.

04. Instructional duration in an academic year

- a) The academic year shall consist of 2 Semesters, each consisting of a minimum of 16 weeks of instruction, including intervening holidays, but excluding the period of examinations and study holidays.
- b) The course will follow Semester pattern, with an End semester examinations, conducted by the Board of Technical Examinations, Kerala State. The examinations for first year (Semester I & II Combined) will be conducted at the end of second semester.
- c) There will be 7 Instructional periods of 55 Minutes duration per Day, and there shall be 5 working days in a week from Monday to Friday, and thereby 35 Periods per Week.

05. Minimum attendance required for obtaining eligibility to appear for the Examination.

- a) A candidate must secure a minimum of 80% attendance in the combined First and Second Semester and in each subsequent Semester, in order to secure the eligibility to appear for each End Semester examinations.
- b) In the case of those students with 65% or more attendance but could not attain 80% attendance due to Medical reasons, the Principal of the Polytechnic, at his/her discretion, may grant the eligibility to appear for the examination, subject to the remittance of “Condonation fee”, fixed by the Government from time to time.
- c) Students who have secured less than 65% attendance are not eligible to apply for “condonation”, and will not be allowed to appear for the examination under any circumstances.

- d) Students who have shortage of attendance, but not condoned, in any of the semesters including first year, are not eligible to appear for the end Semester Examinations, and therefore not eligible to be promoted to the higher semesters. They may seek readmission. Application for readmission may be entertained only for genuine cases on medical grounds and in doubtful cases the Principal may seek report from medical board for verification.
- e) Condonation of attendance is permitted only once in the entire course of study both in the case of regular and part time courses.

06. Scheme of Evaluation.

- a) The scheme of evaluation shall consist of (1) Internal assessment (Sessional) and (2) End Semester examinations in Theory and Practical Subjects. The maximum marks for End Semester Examinations, and Internal Assessment, both for the Theory and Practical papers will be 75 and 25 respectively except for the Combined I & II Semesters. However, for some exceptional subjects, this may vary. Details of break up of marks are given in the Curricula of each discipline.
- b) The Total marks (Internal and End Semester Examinations) will be as follows:
 - Combined I &II Semesters: 1000 Marks
 - III to VI Semesters: 700 Marks/ Semester
- c) All the end examination including the drawing examination will normally be of 180 Minutes duration. In certain specialized disciplines this requirement may not be adhered to strictly and the End Semester Examination of a longer duration may be permitted.

07. Award of internal assessment marks.

- a) In respect of theory subjects the award of sessional mark will be on a Continuous Evaluation method, based on tests, assignments and attendance in the proportion of 40% for tests, 40% for assignments and 20% for attendance. There will be a minimum of three tests and Three Assignments, and all the 3 Test papers and 3 Assignments are taken into account for the calculation of Final Internal Assessment Marks.
- b) Split up of Internal Assessment Marks :

A. Attendance:

Sl.No.	Percentage of Attendance*	Marks to be awarded (computed for 5 Marks)
1	Below 65	Zero
2	65 to 79	1
3	80 to 84	2
4	85 to 89	3
5	90 to 94	4
6	95 and above	5

B. Practical:

Sl.No.	Criteria component	Marks to be awarded
1	Observation Note/ Rough Record	20%
2	Fair Record (Timely submission, Accuracy and Neatness)	20%
3	Attendance*	20%
4	Test	40%

C. Drawing

Sl.No.	Criteria component	Marks to be awarded
1	Submission of Completed Drawing Sheets (Timely submission, Accuracy and Neatness)	40%
2	Attendance*	20%
3	Test	40%

*Percentage of attendance for that particular subject only is counted here.

D. Seminar

Sl. No.	Criteria component	Marks to be awarded
1	Relevance of Topic	10%
2	Collection of materials	20%
3	Presentation (Presentation slides, Delivery)	40%
4	Question-Answer,/Discussion	20%
5	Seminar Report	10%

E. Project Work

Sl. No.	Criteria component	Marks to be awarded
1	Relevance of Topic & Selection of	10%
2	Knowledge in the Tool	20%
3	Selection of Tool	20%
4	Fabrication & Final product	20%
4	Role of the individual in the Team	20%
5	Project Report	10%

- c) The Faculty concerned will maintain a record of all details regarding Attendance and Internal Assessment marks awarded in the prescribed log book. The students can represent their grievances, if any, in respect of marks awarded, to the concerned Head of Section for clarification.
- d) The students are required to keep a record of all their laboratory exercises performed by them in the form of a laboratory record. This record has to be authenticated by the teacher-in-charge of the laboratory and certified as the record of the bonafide work done by the student by the Head of Section before he is allowed to take the practical examinations. No student will be permitted to take any practical examinations without the bonafide Record.

08. End Examination

- a) In each theory subject and in the drawing subject there will be an end examination in each Semester conducted by the Board of Technical Examination, Kerala State as per the pre-announced notification of examinations. The Timetable for the examination will also be informed to the students ahead of their conduct.
- b) Regular/Supplementary examination for all semesters will be held at the end of each semester as the case may be.
- c) The question paper for each Theory paper (excluding the Drawing papers) will consist of Two parts:
Part A – is for a maximum of 15 marks consisting of 10 short answer type questions of 1½ (One and a half) marks each (to be answered in one or two sentences) covering the whole subjects area. There will be no choice in Part A.
Part B – consists of 10 structured essay type questions of 12 marks each with two question from each of the five units in a subject. Students will have to attempt one question from each unit to score the prescribed maximum of 60 marks.
The part A and Part B will be given together in one question paper.
- d) For drawing subjects, the design of question paper will be according to the needs of that particular drawing. There will not be any short answer type question in drawing.
- e) For practical end examinations, the Board of Technical Examination, Kerala State will appoint examiners who will set a question paper consisting of practical exercises. This will be used for that practical subject.

09. Minimum marks for a pass

- a) A candidate must secure a minimum of 40% marks in the End Semester examination in Theory and Practical for a Pass in each subject. There will be no separate minimum for a pass in the internal assessment but the total marks of End Semester examination and Internal assessment should not be less than 40% for a pass each subject.

10. Rules for promotion to the Higher Semesters.

- a) A candidate will be allowed to go to the next higher Semester, if he/she attended the Combined I & II Semester/ Previous Semester, and has fulfilled the conditions of attendance requirement. However,
- b) A candidate will be permitted to register for the Fifth Semester Examination if and only if he/she has passed all the subjects of the Combined I & II Semester, and
- c) A candidate will be permitted to register for the Sixth Semester Examination only if he/she has passed all the subjects of Combined I & II, and III Semesters.

11. Classification of successful candidates

- a) Candidates shall be declared to have passed the diploma course only if he/she has secured a Pass in all the theory and practical subjects in all the Six Semesters of study.
- b) There will be 3 classifications of passed candidates namely.
 - First class with distinction
 - First class and
 - Second class
- c) The total marks of the Semesters from 3 to 6 shall be considered to classify the successful candidates. That is all these marks will be added and the percentage of marks out of 2800 worked out.

First Class with Distinction

A candidate will be declared to have passed the Diploma Course in First Class with Distinction if he/she secures not less than 75% of the aggregate marks in all Semesters put together except First Year (Combined I & II Semesters) and passes all the above semesters including the Combined I & II Semesters in the first appearance itself, within the stipulated period of normal study, i.e., Three Years of Six Consecutive Semesters, without any break.

First Class

A candidate will be declared to have passed the Diploma Course in First Class if he/she secures not less than 60% of the aggregate marks in all Semesters put together except First Year (Combined I & II Semesters) and passes all the above semesters including the Combined I & II Semesters, within three consecutive chances including his regular chance offered by the Board of Technical Examination.

Second Class

All other successful candidates will be declared to have passed in the Second Class

12. Provision for Improvement/Betterment:

- a). A candidate, if he desires, may improve his/her marks in any subject, in the immediate chance that follow his regular chance/attempt, in the 3rd, 4th and 5th Semesters. A “regular attempt/chance” is defined as the examination chance of the current semester of his/her study.
- b) A candidate, if he/she desires, will be permitted to better his/her marks of the 6th Semester Subjects by reappearing for the entire subjects of that semester together, by taking the next available chance only. (Betterment can be done only for the 6th Semester)
- c) Improvement/betterment will not be reckoned as another chance/attempt. Candidates appearing for betterment will not be considered for the purpose of ranking.

13. **Award of Rank:** Rank Holder in each Discipline will be selected from among the successful candidates who have passed the Diploma course in “FIRST CLASS WITH DISTINCTION” only. “Grace mark” awarded for the performance in arts/sports/similar extra or co- curricular

activities will not be considered for determining the rank holders subject to rules 11 and 12 above.

14. Maximum duration of the Diploma Course:

Normal duration of the diploma course is 6 consecutive Semesters, spanned in 3 Academic Years, as stated in para 01. However, in the case of those who have not acquired Diploma within the stipulated minimum duration of 3 Years, he/she may acquire the Diploma taking a maximum duration of another 3 Years. However, the maximum number of chances to appear for the End Semester examination is limited to 4, including his/her regular chance.

15. Cancellation of Candidature in the Diploma Examination:

If a candidate desires to cancel his candidature for end semester Examination he/she should forward the duly filled in Application Form, recommended by the Principal of the Polytechnics so as to reach the office of the Controller of Technical Examinations within 10 days after the completion of the last theory Examination of that particular Semester examination. For those who have applied for the examination and absent without canceling their candidature, it will be treated as an attempt/ chance. Cancellation of candidature in any Semester Examination is allowed only once. Candidates reported for malpractice will not be eligible for cancellation of examination.

16. Defaulters of fee:

Defaulters of fee will not be permitted to register for the End Semester examination

17. General Information:

Norms for transfer of students:

- a) Application for transfer from one institution to another will be entertained only at the second year (3rd Semester) of the Diploma course. Candidates who desire to get transfer to another institution in the second year (3rd Semester) should submit the application in the prescribed “format for transfer” to the Principal of the Institution to which transfer is requested, through the Principal of the institution where the candidate is studying within 10 days from the date of re-opening of the institution after midsummer vacation.
- b) All applications received within the stipulated time will be processed and the list of candidates selected for transfer on the basis of the index marks secured by the candidates for admission to Polytechnics to the first year (Combined I and II semester) will be published by the concerned principals of the polytechnics to which transfer is requested for, and the selected candidates will be informed accordingly.
- c) Principals of Polytechnics should intimate the names of candidates transferred with branch of study to other institution to the Joint Controller of Technical examinations with details such as name of institutions to which transferred, date of transfer, and Diploma Examinations Register Number within ten days from the last date of admission.

NOTE

The syllabus for the diploma courses in Engineering/Technology are being updated in the semester pattern from the academic year 2006-07. The Government of Kerala in its draft IT policy have stressed the importance of Free & Open Source Software (FOSS). More over the students have completed their schooling using FOSS.

The revision of the Polytechnic Curriculum was in such a way that the use of FOSS can be utilized. It can be observed that in the following subjects the use of FOSS can be promoted,

1. CT 102 / CHM 102/INF102	Software Lab 1
2. CT 306 / CM 306/ IF 306	Software Lab II (C++ & Java) / (C ++)
3. CT 406 / IF 405	Software Lab IV(RDBMS)
4. CT 506 / CM506 / IF 506	Software Lab VII / Software Lab III / Software Lab VIII (Operating Systems)
5. CT 604 /IF 604	Software Lab IX (Web Technology)
6. IF 406	Software Lab V (Java)

The following Software may be downloaded free and used,

- | | |
|--------------------------------|----------|
| a. gcc compiler | Language |
| b. g++ | C++ |
| c. GNU/Linux | |
| d. MySQL, Postgress, PHP, Java | |

The students will get adequate familiarity with Microsoft's windows environment in the other subjects like,

1. CT 307 /CM 507/IF 307	Software Lab III / Software Lab IV / Software Lab III (VB)
2. CT 507 / IF 605	Software Lab VIII (VC++)
3. IF 507	Software Lab IX (Multi Media)

Hence the students will be in a position to handle both the environments smoothly.

It is requested that in tune with the Govt. IT policy, FOSS be promoted to the maximum extent for practical classes with in the framework of the curriculum and facilities available.

SUBJECTS OF STUDY AND SCHEME OF EVALUATION

**Branch: (i) Computer Engineering
(ii) Computer Hardware Maintenance
(iii) Information Technology**

Semester : Combined I and 2

Code	Subject	Periods Per Week			Evaluation (Marks)			
		Theory	Practical	Total	Theory	Practical	Internal	Total
	THEORY:							
GE101	English	4	----	4	100	----	25	125
GE102	Technical Mathematics	6	----	6	100	----	25	125
GE103	Applied Science							
A	Physics	3	----	3	50	----	12.5	62.5
B	Chemistry	3	----	3	50	----	12.5	62.5
GE104	Engineering Graphics	1	3	4	100	----	50	150
GE 105	Computer Fundamentals & Programming in C	3	----	3	100	----	25	125
CT 101 / CM 101/EL 101/EC 101/IF 101	Basic Electrical & Electronics	4	----	4	100	----	25	125
	PRACTICAL:							
GE106	Applied Science Lab							
A	Physics	----	1	1	----	25	12.5	75
B	Chemistry	----	1	1	----	25	12.5	
CT102/ CM102 / IF102	Software Lab-I	----	3	3	----	50	25	75
CT103/ CM103 /IF 103	Electronics Lab	----	3	3	----	50	25	75
TOTAL		24	11	35	600	150	250	1000

SUBJECT TITLE	:	ENGLISH
SUBJECT CODE	:	GE 101
PERIODS PER WEEK	:	4
PERIODS PER YEAR	:	128
TOTAL MARKS	:	100 (YEARLY EXAMINATION FOR I AND II SEMESTERS)

TIME SCHEDULE

UNIT	TOPICS	PERIODS
I	a) Lessons – From Ignited minds The dream and the message Give us a role model	10 10
II	a) Lessons – From Ignited minds Visionary teachers and scientists	15
III	a) Phonetics and Grammar Introducing speech sounds Consonants, Vowels, Syllables, Stress etc. Tense, Nouns, Verbs, Articles, Active voice and Passive voice Prepositions, Adverbs, Auxiliaries, Direct and Indirect Speech Formation of Questions & Question tags	29
IV	a) Lessons – from Ignited minds Learning from Saints & Seers Patriotism Beyond Politics and Religion To My Country Men Epilogue	15 15 5 5
V	a) Composition Essay writing Comprehension Precise writing Note making Application for Jobs Preparation of bio – data	24
	Total Periods	128

AIM :

The special needs of the technical students in English language require a curriculum that enables them to handle the language as an effective tool for communication. An integration of the four – fold language abilities namely listening, speaking, reading and writing aims at developing the ability to correctly and effectively use the language for specific technical requirements. Thus the teaching of English language to Technical students will definitely help them for their performance in their professional needs.

OBJECTIVES :

1. Comprehension

- 1.1 Discriminate words and derive ideas in a speech/writing
- 1.2 Express the main ideas in a summary
- 1.3 Organise logically the piece of information provided.
- 1.4 Comprehend written English available in the prescribed text.

2. Vocabulary

- 2.1 Identify the key words
- 2.2 Relate the correct meaning to the terms used
- 2.3 Extend the vocabulary
- 2.4 Use a thesaurus
- 2.5 Study the arrangement of words in sentences
- 2.6 Identify the structural functions of words in sentences.

3. Grammar

- 3.1 Use of tense forms
- 3.2 Nouns, Verbs, Articles
- 3.3 Identify sentence types
- 3.4 Analyse the different types of sentences
- 3.5 Study the ways of negation
- 3.6 Convert direct speech into Indirect speech
- 3.7 Realise active and Passive Voice constructions.

4. Composition

- 4.1 Practice writing essays, précis, note making
- 4.2 Preparation of Application for Jobs and Bio – data

5. Spoken Communication

- 5.1 Distinguish between formal and informal speech situations
- 5.2 Simulate model conversations
- 5.3 Converse within the peer group
- 5.4 Conduct seminars on topics learned in the text.
- 5.5 Conduct model Interviews
- 5.6 Arrange group discussions on General topics

6. Pronunciation

- 6.1 Introduce speech sounds
- 6.2 Consonants, Vowels, Syllables, Stress etc.
- 6.3 Find out pronunciation of words from dictionary
- 6.4 Transcribe words and short passages in broad phonemic script

STUDY MATERIALS

1. Ignited Minds by A.P.J. Abdul Kalam Published by Penguin Books
Chapters : The Dream and the message, Give us a role model, Visionary teachers and scientists. Learning from Saints and seers, Patriotism beyond politics and religion, To my country men, Epilogue.
2. Essential English Grammar by Raymond Murphy Published by Cambridge University Press.
3. Intermediate English Grammar by Raymond Murphy published by Cambridge University Press.
4. Phonetics – A Text Book of English Phonetics for Indian Students by T. Balasubramaniam Published by Macmillan India (P) Ltd.
5. Composition – A Text Book of Two way Communication Techniques by Prof. P.P. John Published by Publication Division, University of Calicut.
6. English Pronouncing dictionary by Daniel Jones Published by Cambridge University Press.

SCHEME FOR SETTING QUESTION PAPERS

TOTAL MARKS : 100
DURATION 3 HOURS

I	Short answer questions	7 Numbers	Answer any 5 (5X2)	10 marks
II	Paragraph questions	7 Numbers	Answer any 4 (4X5)	20 marks
III	Essay questions	3 Numbers	Answer any 1 (1X10)	10 marks
IV	Grammar			30 marks
V	Phonetics			10 marks
VI	Composition			20 marks
			Total	<hr/> 100 marks

SUBJECT TITLE : TECHNICAL MATHEMATICS
SUBJECT CODE : GE 102
PERIODS/WEEK : 6
TOTAL PERIODS : 6 x 32 = 192

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	1.1 Matrices	8
	1.2 Determinants	6
	1.3 Binomial Series	6
	1.4 Trigonometric Functions	8
	Tutorials	4
	Test on Topics 1.1 to 1.4	3
II	2.1 Properties of Trigonometric functions	7
	2.2 Properties of triangles	6
	2.3 Solutions of a triangle	7
	2.4 Co-ordinate Geometry	8
	Tutorials	4
	Test on Topics 2.1 to 2.4	3
III	3.1 Functions and Limits	8
	3.2 Methods of Differentiation – I	10
	3.3 Methods of Differentiation – II	10
	Tutorials	4
	Test on Topics 3.1 to 3.3	3
IV	4.1 Application of differentiation	10
	4.2 Maxima and minima	8
	4.3 Indefinite Integral	10
	Tutorials	4
	Test on Topics 4.1 to 4.3	3
V	5.1 Integration by parts	6
	5.2 Definite Integral	6
	5.3 Application of integration	8
	5.4 Differential Equations	8
	Tutorials	4
	Test on Topics 5.1 to 5.4	3
	Revision	10
	Model test and feed back	7

192

OBJECTIVES

On completion of the units, the student will be able to

UNIT – I

1.1 Matrices

- 1.1.0 Understand operations on matrices such as addition, subtraction, transpose, adjoint, inverse and multiplication
- 1.1.1 Define a matrix
- 1.1.2 Identify the type of a given matrix (Square, Unit, Singular etc)
- 1.1.3 Perform operations of addition and multiplication of a given matrix
- 1.1.4 Define – transpose, adjoint and inverse of a matrix
- 1.1.5 Find the inverse of 2 x 2 and 3 x 3 matrices
- 1.1.6 Solve linear equations by using the inverse of the coefficient matrix

1.2 Determinants

- 1.2.0 Solve simultaneous linear equations using determinants
- 1.2.1 Evaluate determinants of second and third order
- 1.2.3 Find the minors and cofactors of the elements in a determinant
- 1.2.4 Solve simultaneous linear equations in 3 unknowns using Cramer's rule.
- 1.2.5 Elimination of three linear equations in to unknowns.

1.3 Binomial series

- 1.3.0 Understand the binomial theorem for positive integers
- 1.3.1 State the meaning of nC_r
- 1.3.2 Derive formula for nC_r and the proof of $nC_r = nC_{n-r}$
- 1.3.3 State the Binomial theorem for positive integers
- 1.3.4 Find a given term in a binomial expansion

1.4 Trigonometric functions

- 1.4.0 Understand the concept of trigonometric functions of any angle
- 1.4.1 Define trigonometric functions
- 1.4.2 Describe signs of trigonometric functions in each quadrant
- 1.4.3 Find other functions, given a trigonometric function and its quadrant
- 1.4.4 Find the trigonometric values of the angle between 0° and 360° .
- 1.4.5 Find the value of trigonometric functions by using tables.

UNIT – II

2.1 Properties of Trigonometric Functions

- 2.1.0 Apply properties of trigonometric functions of compound angles, multiple and submultiple, sum and product formulae
- 2.1.1 State the identities for $\sin(A \pm B)$, $\cos(A \pm B)$, $\tan(A \pm B)$.
- 2.1.2 Solve the problems of the types
 - (1) Prove that $\frac{\cos A - \sin A}{\cos A + \sin A} = \tan(45^\circ - A)$
- 2.1.3 Prove the formulas for $\sin 2A$, $\cos 2A$, $\tan 2A$, $\sin 3A$ and $\cos 3A$
- 2.1.4 State the identities for $\sin A$, $\cos A$, $\tan A$ in terms of $A/2$.
- 2.1.5 Solve the problems of the type: if $\sin A = 0.6$ and A is acute, find $\sin 2A$ and $\cos A/2$
- 2.1.6 Express sum or difference of two sines or two cosines as a product and vice versa.
- 2.1.7 Apply sum and product formulae to do the problems of the type
 - (1) $\frac{\sin A + \sin 3A + \sin 5A}{\cos A + \cos 3A + \cos 5A} = \tan 3A$
 - (2) $\sin 10^\circ \sin 50^\circ \sin 70^\circ = 1/8$

2.2 Properties of Triangles

2.2.0 Understand the properties of triangles

2.2.1 State and prove the following identities

1) $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} = 2R$

2) $a^2 = b^2 + c^2 - 2bc \cos A$

3) $a = b \cos C + c \cos B$

2.2.2 State and prove

1) Napier's formula

$$\tan\left(\frac{B-C}{2}\right) = \frac{b-c}{b+c} \cot\left(\frac{A}{2}\right)$$

2) $(b-c) \cos\left(\frac{A}{2}\right) = a \sin\left(\frac{B-C}{2}\right)$

2.3 Solution of triangles

2.3.0 Solve a triangle given necessary data

2.3.1 Solve a triangle, given

1) Three sides

2) Two sides and the included angle by using Napier's formula.

2.4 Co-ordinate Geometry

2.4.0 Understand various forms of the equation of a straight line

2.4.1 Define slope of a straight line

2.4.2 Find the slope of a line joining two points (x_1, y_1) and (x_2, y_2)

2.4.3 Derive the equation of a straight line of the form

1) $y = mx + c$

2) $y - y_1 = m(x - x_1)$

3) $\frac{y - y_1}{y_1 - y_2} = \frac{x - x_1}{x_1 - x_2}$

4) $\frac{x}{a} + \frac{y}{b} = 1$

2.4.4 Find the equation of a line given suitable data using any of the above form.

2.4.5 Find the slope and intercepts on the axes, given a linear equation in 'x' and 'y'.

2.4.6 Find the point of intersection of two lines whose equations are given

2.4.7 Find the angle between two lines

2.4.8 Find the condition for two lines are

1) Parallel

2) Perpendicular

2.4.9 Find the equation of the line

1) Parallel and

2) Perpendicular to a given line and passing through a given point.

UNIT – III

3.1 Functions and Limits

3.1.0 Understand the concepts of functions and limits

3.1.1 Give example for functions

3.1.2 Explain the meaning of limit of the following type

1) $\lim_{x \rightarrow a} f(x) = l$

2) $\lim_{x \rightarrow \alpha} \frac{1}{x} = 0$

3.1.3 Find the limit of the following type

1) $\lim_{x \rightarrow 1} \frac{2x+1}{3x-2}$

2) $\lim_{x \rightarrow \alpha} \frac{2x^2+3x}{5x^2+4x+1}$

3) $\lim_{x \rightarrow \alpha} \frac{x^2-3x}{x^2-3x}$

- $x \rightarrow 3 \quad x^2 - 9$
- 3.1.4 verify the following results
- 1) limit $\frac{x^n - a^n}{x - a} = n a^{n-1}$, when n is rational
 - 2) limit $\frac{\sin \theta}{\theta} = 1$, $\theta \rightarrow 0$, θ is in radian
- 3.1.5 Solve problems of the type
- 1) Limit $\frac{\sqrt{x} - \sqrt{a}}{x - a}$
 - 2) limit $\frac{\sin m\theta}{\theta}$, $\theta \rightarrow 0$
- 3.1.6 Describe the general definition of continuous functions

3.2 Methods of Differentiation – I

- 3.2.0 Apply the methods of differentiation
- 3.2.1 Define the derivative of a function $y = f(x)$ as $\lim_{\Delta x \rightarrow 0} \frac{\Delta y}{\Delta x}$
- 3.2.2 Show the geometrical concept of derivatives
- 3.2.3 Find the derivatives of x^n , $\sin x$, and $\cos x$ from first principles
- 3.2.4 State the rules of differentiation
- 1) Sum or difference
 - 2) Product
 - 3) Quotient
- 3.2.5 Find derivatives of e^x and $\log n$. State all the fundamental formulae
- 3.2.6 Apply the rules and differentiate simple functions of the type
- 1) $x^2 \sec x$
 - 2) $\frac{\tan x}{x^2 + 1}$
 - 3) $\frac{x \operatorname{Cosec} x}{3x - 2}$

3.3 Methods of Differentiation – II

- 3.3.0 Apply different methods of differentiation
- 3.3.1 Find the derivatives if the functions of the form $[f(x)]^n$, $\sin f(x)$, $\cos f(x)$, with respect to x.
- 3.3.2 Find the derivatives of $e^{\sin x}$, $\log \sin x$, $(x^2+1)^{10}$, $\sec 5x$, $\frac{\sin 2x}{1+\cos 2x}$, $\cot^5(x^3)$, $\log(\sec x + \tan x)$
- 3.3.3 Find the derivative of the implicit functions of the form $ax^2 + 2hxy + by^2 = 0$
- 3.3.4 Differentiate parametric functions of the type $x = f(t)$, $y = g(t)$
- 3.3.5 Find the second derivative of the functions $y = \frac{x}{x-2}$, $y = x^2 \sin x$
- 3.3.6 Solve the problem of the type
If $y = x^2 \cos x$, show that $x^2 \frac{d^2y}{dx^2} - 4x \frac{dy}{dx} + (x^2+6)y = 0$

UNIT – IV

4.1 Applications of Differentiation

- 4.1.0 Apply the theories of differentiation in different problems
- 4.1.1 State geometrical meaning of derivatives
- 4.1.2 Find the slope of the curve
 $y = x^2 - 3x + 2$ at (3,2)
 $y = \tan x$ at $x = \pi/3$
- 4.1.3 Find the equation of the tangent and normal to the semi circle
 $y = \sqrt{25-x^2}$ at (4,3) on it
- 4.1.4 Solve problems of the type: The radius of a circular plate is increasing in length at 0.1 cm per second. What is the rate at which the area is increasing when the radius is 12 cm.
- 4.1.5 Solve problems of the type: A spherical balloon is inflated with air such that its volume increases at the rate 5.c.c per second. Find the rate at which its curved surface is increasing when its radius is 7 cm.
- 4.1.6 Solve problems of the type: The displacement 'S' in time 't' is given by $S = 2/3t + \text{Cost}$ at $t = \pi/4$; find the velocity and acceleration

4.2 Maxima and Minima

- 4.2.0 Apply the concept of derivative to find maxima and minima
- 4.2.1 State the conditions for a function
 $y = f(x)$ to be (1) increasing (2) decreasing
- 4.2.2 State the conditions for maximum and minimum values of a function
- 4.2.3 Solve the problem of the type:
 - 1) Find the maximum and minimum values of $y = x^3 - 18x^2 + 96x$
 - 2) Prove that a rectangular of fixed perimeter has its maximum area when it becomes a square.

4.3 Indefinite integral

- 4.3.0 Apply various methods of integration
- 4.3.1 Explain that $\int f(x)dx = f(x) + c$ means $\frac{d}{dx}[f(x)+c] = f(x)$, c being an arbitrary constant
- 4.3.2 State the standard formulas of integral $x^n, \sin x, \cos x, e^x$, etc
- 4.3.3 Find the integrals using the rules
 - 1) $(u \pm v) dx = \int u du \pm \int v dx$
 - 2) $k u dx = k \int u dx$
- 4.3.4 Evaluate the integrals of the form
 - 1) $\int f(ax+b) dx$
 - 2) $\int \sin^2 x dx$
- 4.3.5 Evaluate the integrals of the form
 - 1) $\int x \sin(x^2) dx$
 - 2) $\int \frac{2x^4}{1+x^{10}} dx$
 - 3) $\int \cos^3 x \sin x dx$
 - 4) $\int e^{x^2} x dx$

UNIT – V

5.1 Integration by parts

5.1.0 Solve the problems of the type

- 1) $\int x \cos x \, dx$
- 2) $\int x^2 e^{-x} \, dx$
- 3) $\int x \log x \, dx$
- 4) $\int \log x \, dx$

5.2 Definite Integrals

5.2.0 Understand the concept of definite integral

5.2.1 Define the definite integral

$$\int_a^b f(x) \, dx = f(b) - f(a) \text{ where } F'(x) = f(x)$$

5.2.2 Evaluate the definite integral

1) $\int_0^1 x(1-x)^2 \, dx$

2) $\int_0^{\pi} \sin^2 x \, dx$

3) $\int_0^1 x\sqrt{1+x^2} \, dx$

4) $\int_0^{\pi} \frac{1-\sin x}{x+\cos x} \, dx$

5) $\int_0^{\pi/2} x \cos x \, dx$

5.3 Application of Integration

5.3.0 Apply the concept of definite integral to solve problems of the following

5.3.1 Find the area bounded by a curve, two ordinates (abscissa) and x – axis (y axis)

5.3.2 Find Volume of a solid of revolution about x or y axis

5.4 Differential equations

5.4.0 Solve simple differential equations of first order

5.4.1 Solve the differential equation of the variable separable type

5.4.2 Solve the differential equation of the form $dy/dx + Py = Q$ where P and Q are simple functions of x

CONTENT DETAILS

UNIT – I

1.1 Matrices

Matrix notation, order of a matrix, and type of matrices: - Square matrix, unit matrix, Zero matrix, and Singular matrix. Transpose of a matrix, symmetric and skew-symmetric matrices, sum and product of matrices, Adjoint of a matrix, inverse of a matrix (definition only) and problems.

1.2 Determinants

Determinants of second and third order matrices, minors and cofactors, Cramer's rule, solution of simultaneous linear equations in three unknowns by Cramer's rule. Elimination of three linear equations in two unknowns.

1.3 Binomial series

Idea of nC_r , Value of nC_r (no derivation). Binomial theorem for positive integers (no proof), finding a given term in a Binomial Expansion.

1.4 Trigonometric functions

Definition of trigonometric functions of an angle in any quadrant, Signs of trigonometric functions of related angles, Given a trigonometric functions of an angle and its quadrant find others. Find the values of the trigonometric functions between 0° and 360° .

UNIT – II

2.1 Properties of trigonometric functions

Addition formulae, Multiple and Sub-multiple formulae, Sum and Product formulae, simple problems.

2.2 Properties of triangles

State and prove Sine rule, Cosine rule and projection formula. State and prove Napier's formula and simple problems relating to this.

2.3 Solution of triangle

Solve the triangle given

1. Three sides
2. Two sides and the included angle (use Napier's formula)

2.4 Co-ordinate geometry

Straight line-Slope, Equations of a straight line in the forms

- 1) $Y = mx + C,$
- 2) $y - y_1 = m(x - x_1),$
- 3) $\frac{y - y_1}{y_1 - y_2} = \frac{x - x_1}{x_1 - x_2}$
- 4) $\frac{x}{a} + \frac{y}{b} = 1$

Points of Intersection of two lines, Angle between two lines, Conditions for two lines, Conditions for two lines to be parallel and predictor.

UNIT – III

3.1 Function and Limits

Definition, some problems for finding limits, Properties

Limit $\frac{x^n - a^n}{x - a} = na^{n-1}$ and limit $\frac{\sin \phi}{\phi} = 1$ (statements only),
 $x \rightarrow a$ $x - a$ $\phi \rightarrow 0$ ϕ

General definition of continuous functions.

3.2 Methods of Differentiation I

Definition of derivative of x^n , $\sin x$, $\cos x$ etc by using first principle, find derivatives of e^x and $\log x$, Fundamental formulas, product and Quotient rules (statement only). Derivatives of other trigonometric functions, Simple problems.

3.3 Methods of Differentiation II

Function of a function rule, Differentiation of implicit and parametric equations, problems on differentiation of functions involving these forms, second order derivatives, Simple problems.

UNIT – IV

4.1 Application of Differentiation

Geometrical meaning of derivatives, Slope, Tangent, Normal and Equation of a straight line, Rate of change.

Problems connecting Area and Volume, Velocity and Accelerations.

4.2 Maxima and Minima

Increasing and Decreasing functions, Turning points, Finding Maximum and Minimum values of a function by using derivatives, Conditions for Maximum and Minimum, Simple problems.

4.3 Indefinite Integral

Definition of integration, Fundamental formulas, Problems, Integration by substitution, function of the form $\int f(g(x))g'(x) dx$, $\int f(ax + b)^n dx$

UNIT – V

5.1 Integrates by parts

Integral of the product of two functions, formula (without proof) and simple problems.

5.2 Definite Integral

Definitions, simple problems, $\int_0^{\pi/2} \sin^2 x dx$, $\int_0^{\pi/2} \frac{\sin x}{\sqrt{1-\cos x}} dx$

5.3 Application of integration

Finding areas between the curve $y = f(x)$ and the axes, Volume of the solid, Problems

5.4 Differential equations:

Solutions of equations of the form Variable separable, Linear equations.

REFERENCE BOOKS

1. Washington A.J. : Basic Technical Mathematics, Addison Wesley
2. Green John. R : Calculus with Analytic Geometry, McGraw Hill Book Co.,
3. Karuppanan. T.C. : Mathematics for Technical Students, Macmillan and Co.,
4. T.T.T.I. Madras : Mathematics for Technicians Vol. I and II,
Sehgal Educational Consultants (P) Ltd, Faridabad
5. Shanti Narayanan : Algebra

SUBJECT TITLE : APPLIED SCIENCE – A - PHYSICS
SUBJECT CODE : GE 103 A
PERIOD/WEEK : 3
PERIODS/YEAR : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	1.1 Units And Dimensions	5
	1.2 Dynamics	14
	1.3 Work, Power and Energy	5
	1.4 Rotational Dynamics	6
	Test – I	2
II	2.1 Statics	10
	2.2 Elasticity	4
	2.3 Fluid Flow	5
	2.4 Viscosity	3
	2.5 Surface Tension	3
	2.6 Simple Harmonic Motion	5
	Test – 2	2
III	3.1 Optics	7
	3.2 Electricity	12
	3.3 Semiconductors	6
	3.4 Laser	2
	3.5 Photoelectric Effect	3
	Test – 3	2
	Total	96

OBJECTIVES

On Completion of the unit, the student will be able to

UNIT – I

1.1 Units And Dimensions

- 1.1.0 Understand the concept of units and measurements with a basic knowledge about dimensions
- 1.1.1 Define Unit of a physical quantity.
- 1.1.2 Explain the principle of measurement.
- 1.1.3 Identify fundamental and derived units.
- 1.1.4 Define dimension of a physical quantity.
- 1.1.5 Derive dimensional formula for physical quantities.

1.2 Dynamics

- 1.2.0 Apply the dynamics of a particle in practical situations.
- 1.2.1 Identify vector and scalar quantities.
- 1.2.2 Derive the expression $S_n = u + a(n - \frac{1}{2})$
- 1.2.3 Solve Problems related to gravity with equations of motion.
- 1.2.4 Derive the expressions for time of flight, horizontal range and maximum height for a projectile.
- 1.2.5 Solve the problems based on the above expression
- 1.2.6 State the Newton's laws of motion
- 1.2.7 Define the terms:
 - 1. Force
 - 2. Inertia
 - 3. Momentum
- 1.2.8 Derive the relation $F = ma$
- 1.2.9 State Law of conservation of momentum and prove it in the case of two bodies making a collision.
- 1.2.10 Explain the principle behind recoil of gun and derive an expression for recoil velocity.
- 1.2.11 Solve Problems related to Laws of motion.
- 1.2.12 Define angular displacement, angular velocity and angular acceleration.
- 1.2.13 Derive relation between linear velocity and angular velocity.
- 1.2.14 Derive expression for centripetal acceleration.
- 1.2.15 Apply the principle of centripetal force in the case of banking of roads and rails.
- 1.2.16 Solve problems related to centripetal force.

1.3 Work, Power and Energy

- 1.3.0 Understand the concepts of work, power and energy and their applications
 - 1.3.1 Define 1. Work 2. Power 3. Energy
 - 1.3.2 Distinguish between Potential Energy and Kinetic Energy and mention the expressions for them.
 - 1.3.3 Solve problems using the above expressions.

1.4 Rotational Dynamics

- 1.4.0 Understand the dynamics of a rotating body.
- 1.4.1 Define Moment of Inertia of a rigid body
- 1.4.2 Define Radius of gyration
- 1.4.3 State theorems of parallel and perpendicular axes.
- 1.4.4 Define Torque
- 1.4.5 Mention relation between torque and angular momentum.
- 1.4.6 Mention the expression for kinetic energy of rotation.
- 1.4.7 Derive an expression for moment of inertia of a uniform circular disc about an axis passing through its center and perpendicular to its plane.
- 1.4.8 Derive expression for kinetic energy of a disc rotating on a horizontal plane.
- 1.4.9 Solve problems using the above expressions.

UNIT – II

2.1 Statics

2.1.0 Understand the principles of statics and its applications

- 2.1.1 Add Vectors using triangle method.
- 2.1.2 Define Resultant and Equilibrant of vectors.
- 2.1.3 State Parallelogram law of forces.
- 2.1.4 Derive expression for resultant using Parallelogram law.
- 2.1.5 State the law of triangle of forces.
- 2.1.6 State Lami's theorem.
- 2.1.7 Explain moment of a force.
- 2.1.8 State the conditions of equilibrium of a rigid body acted upon by a large number of coplanar parallel forces.
- 2.1.9 Derive expression for work done by a couple.

2.2 Elasticity

- 2.2.0 Comprehend the concept of elasticity
- 2.2.1 Define Stress, Strain and Elastic limit.
- 2.2.2 State Hooke's law.
 - 2.2.3 Derive expression for Young's modulus, rigidity modulus and bulk modulus.
 - 2.2.4 Solve Problems related to modulus of elasticity.

2.3 Fluid Flow

- 2.3.0 Understand the principle of fluid flow
- 2.3.1 Distinguish between Streamline and Turbulent flow.
- 2.3.2 Explain Pressure energy, Kinetic energy and Potential energy of a liquid.
- 2.3.3 Mention equation of continuity.
- 2.3.4 State Bernouille's theorem.
- 2.3.5 Explain the working of airfoil and atomizer.

2.4 Viscosity

- 2.4.0 Apply the principle of viscosity in solving problems.
- 2.4.1 Define coefficient of viscosity.
- 2.4.2 Give the Poiseuille's formula.
- 2.4.3 Explain terminal velocity.
- 2.4.4 Mention Stoke's formula.
- 2.4.5 Explain the effect of temperature on viscosity
- 2.4.6 Solve problems using Poiseuille's formula.

2.5 Surface Tension

- 2.5.0 Comprehend the phenomenon of surface tension and its applications.
- 2.5.1 Define surface tension.
- 2.5.2 Define surface energy.
- 2.5.3 Derive the relation between surface tension and surface energy.
- 2.5.4 Mention the expression for the excess of pressure issued a spherical drop and bubble.
- 2.5.5 Solve problems related to surface tension.

2.6 Simple Harmonic Motion

- 2.6.0 Comprehend the concept of wave motion
- 2.6.1 Define Simple Harmonic motion.
- 2.6.2 Derive equation for S.H. motion.
- 2.6.3 Explain period, frequency, amplitude and phase.
- 2.6.4 Distinguish between transverse and longitudinal waves.
- 2.6.5 Define wavelength.
- 2.6.6 Derive the relation $V = n\lambda$
- 2.6.7 Explain resonance.
- 2.6.8 Explain ultrasonic frequency.
- 2.6.9 Mention applications of ultrasonic.

UNIT – III

3.1 Optics

- 3.1 Understand the concept of optical phenomena
 - 3.1.1 State Snell's law of refraction.
 - 3.1.2 Explain critical angle and total internal reflection.
 - 3.1.3 Explain the propagation of light through optic fiber.
 - 3.1.4 Convex and concave mirror- focus, image formation.
 - 3.1.5 Mention the formula $1/u + 1/v = 1/f$ (No derivation)
 - 3.1.6 Convex and concave lens - focus, image formation.
 - 3.1.7 Mention the formula $1/f = (n-1)(1/R_1 - 1/R_2)$, No derivation
 - 3.1.8 Simple microscope, Magnifying power $m = 1 + D/f$, No derivation.

3.2 Electricity

3.2 Understand the fundamentals of electricity and its magnetic effect

- 3.2.1 State Kirchoff's law.
- 3.2.2 Derive expression for balancing condition of wheat Stone's Bridge.
- 3.2.3 State Biots and Savarts law.
- 3.2.4 Mention the expression for magnetic field due to current through a circular cuf.
- 3.2.5 State Fleming's left hand rule.
- 3.2.6 Describe the principle and construction of a moving coil galvanometer.
- 3.2.7 Explain the conversion of galvanometer into ammeter and voltmeter
- 3.2.8 Solves problems based on the above laws.

3.3 Semiconductors

3.3 Comprehend the working of semiconductor devices

- 3.3.1 Explain P.N. Junction.
- 3.3.2 Describe a junction transistor PNP and NPN.
- 3.3.3 Explain transistor configuration.
- 3.3.4 Describe a common emitter amplifier.
- 3.3.5 Represent Logic gates symbolically.
- 3.3.6 Explain with the help of truth table.

3.4 Laser

3.4 Understand laser action and its application

- 3.4.1 Explain population inversion, spontaneous emission, stimulated emission and optical pumping.
- 3.4.2 Write down the characteristics of LASER.
- 3.4.3 Describe various applications of Laser.

3.5 Photoelectric Effect

- 3.5.0 Comprehend the theories of photoelectric effect
- 3.5.1 Describe Max planks quantum theory.
- 3.5.2 Explain Photoelectric effect and its application.
- 3.5.3 State Laws of Photoelectric emission.
- 3.5.4 Device Einstein's photoelectric equation.
- 3.5.5 Solve problems using the above equation.

CONTENT DETAILS

UNIT – I

1.1 Units and dimensions

Units – fundamental and derived units. Systems of units – S.I. Dimensions – Application – Derivation of expression of period of a simple pendulum using dimension.

1.2 Dynamics

Equation of motion (re-capitulation only) - Derivation of $S_n = U + a (n - \frac{1}{2})$ - Acceleration due to gravity – equation of motion under gravity. Numerical problems.

Projectile motion – Derivation of expressions for Time of flight, Horizontal range, Maximum height Problems.

Linear Momentum, Newton's laws of motion – Definition of force and inertia – Derivation of $F = ma$ – Unit of force. Law of conservation of momentum – Derivation – Recoil of gun. Numerical Problems.

Circular motion – definitions for angular displacement angular velocity and angular acceleration – relation between linear velocity and angular velocity (deviation). Centripetal acceleration and centripetal force-derivation-examples Banking of roads and rails (qualitative) centrifugal force – Numerical problems.

1.3 Work, power and energy

Definitions for Work, Power, Energy – Units of work – Power and energy, Potential energy and Kinetic energy – Expression for P.E and K.E. (no derivation). Numerical problems.

1.4 Rotational Dynamics

Moment of inertia of a rigid body – Radius of gyration. Theorems of Parallel and Perpendicular axis (only statement) – Angular momentum Torque – Relation between Torque and angular momentum

(no derivation) expression for K.E. of rotation (no derivation). Moment of Inertia of a uniform circular disc about an axis passing through its center and Perpendicular to its Plane (derivation) – K.E. of disc rolling on a horizontal Plane. Numerical problems.

UNIT – II

2.1 Statics

Vectors and Scalars – Triangle Method of vector addition – Concurrent forces – Resultant and equilibrant – Parallelogram law – Derivation of the resultant in Magnitude and direction – Law of triangle of forces – Lami’s theorem – Resolution of forces – Parallel forces – Like and unlike Parallel forces – moment of force- Conditions of equilibrium of body under the action of a number of coplanar parallel forces couples – Moment of a couple – work done by a couple – Numerical problems.

2.2 Elasticity

Elastic and plastic bodies – Stress – Strain – units - Hooke’s law – Young’s Modulus Rigidity modulus, Bulk modulus – Numerical problems.

2.3 Fluid flow

Stream line and turbulent flow – Pressure energy, Potential energy and kinetic energy of a liquid – Equation of continuity – Bernoulli’s theorem – Applications – Air foil and Atomizer.

2.4 Viscosity

Viscous force – Coefficient of viscosity – Unit dimension - Poiseuille’s formula (no derivation). Stokes formula - Variation of viscosity with temperature - Numerical problems.

2.5 Surface tension

Surface tension - Surface energy – Relation between S.T and Surface energy (Proof) – Expression for excess of Pressure inside a spherical drop and bubble (no derivation) – Problems.

2.6 Simple Harmonic Motion

Definition of Simple Harmonic Motion – Examples – SHM as projection of uniform circular motion on any diameter of a circle – Equation of SHM – Period, frequency, amplitude, phase motion – Transverse and longitudinal waves. Definition of wavelength and frequency – Derivation of relation $V + f\lambda$ - free vibration – forced vibration – Resonance – Ultrasonic Applications.

UNIT – III

3.1 Optics

Snell’s law of refraction – Critical angle – Total internal reflection – Optical fiber Convex and concave mirror – Focus, image formed by mirror (Qualitative idea only), Mention the formula $1/u + 1/v = 1/f$, (no derivation) – Convex and concave lens, focus image formed by lenses(qualitative idea only), mention the formula $1/f = (n-1)[1/R_1 - 1/R_2]$, no derivation. Simple microscope – magnifying power $m=1+d/f$, No derivation.

3.2 Electricity

Kirchoff’s Laws – WheatStone’s bridge - Condition for balancing – Magnetic effect of Electricity – Biot and Savart Law – Right hand palm rule – Magnetic field due to current through circular coil at a point on the axial line and at the center (no derivation) – Fleming’s Left hand rule – Force on a current carrying Conductor placed in a magnetic field – moving coil galvanometer – theory and construction – Conversion of a galvanometer into ammeter and voltmeter – Numerical problems.

3.3 Semiconductors

PN Junction – Junction transistor – Transistor configuration, α and β – Common emitter amplifier. Logic gates (symbolic representation and truth task only) – AND, OR, NOT gates – universal gates NAND, NOR, XOR gates.

3.4 Laser

Population inversion, Spontaneous emission, stimulated emission, optical pumping – characteristics – applications.

3.5 Photoelectric Effect

Quantum theory – Photoelectric effect – Laws of photoelectric effect – Einstein’s photoelectric equation – Numerical problems.

REFERENCE BOOKS

- | | |
|------------------------------------|------------------------|
| 1. Physics | - Halliday and Resnick |
| 2. Mechanics | - D.S. Mathur |
| 3. Optics | - Jenkins and White |
| 4. Digital and Computer Principles | - Malvino |

SUBJECT TITLE : APPLIED SCIENCE – B. CHEMISTRY
SUBJECT CODE : GE 103 B
PERIODS/WEEK : 3
PERIODS/YEAR : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	INORGANIC AND THEORETICAL CHEMISTRY	
	1.1 Introduction	9
	1.2 Acid Base & Redox Reactions	9
	1.3 Water	8
	Test – I	1
II	PHYSICAL CHEMISTRY	
	2.1 Electrochemistry	10
	2.2 Corrosion	7
	2.3 Energetics	10
	2.4 Colloids	5
	Test – II	1
III	ORGANIC CHEMISTRY	
	3.1 Introduction	4
	3.2 Polymers	9
	3.3 Paints, Varnishes & Adhesives	6
	3.4 Fuels	9
	3.5 Environmental Pollution	5
	3.6 Chemistry In Action	2
	Test – III	1
	Total	96

OBJECTIVES

UNIT - I INORGANIC AND THEORETICAL CHEMISTRY

Formulae and Equations

- 1.1.1 Review the fundamental ideas in chemistry
- 1.1.2 Explain the terms atom, molecule, valency, radical, molecular formula
- 1.1.3 Compute molecular weight from molecular formula
- 1.1.4 Do the calculations based on simple stoichiometric equations – weight(s)/volume(s) of product(s)/reactant(s)

Structure of Atom

- 1.1.5 Understand the basic ideas related to modern approach to the structure of atom
- 1.1.6 State the fundamental particles – proton, electron, neutron – their charge & mass
- 1.1.7 Differentiate atomic number & mass number
- 1.1.8 Explain the concept of isotopes
- 1.1.9 Describe the dual nature of matter
- 1.1.10 Outline de-Broglie equation
- 1.1.11 State Heisenberg's uncertainty principle
- 1.1.12 Explain the concept of uncertainty
- 1.1.13 Distinguish between orbit & Orbital
- 1.1.14 Illustrate the Hund's rule & Aufbau principle
- 1.1.15 Illustrate the electronic configuration of first 20 elements
- 1.1.16 State modern periodic law
- 1.1.17 Classify elements based on electronic configuration

Chemical Bonding

- 1.1.18 Understand the different types of chemical bonds – how & why they are formed
- 1.1.19 Explain the reason for inactivity of zero group elements
- 1.1.20 Illustrate ionic, covalent & co-ordinate bond
- 1.1.21 Define electro-negativity
- 1.1.22 Explain the polar character of covalent bond & significance of Hydrogen Bonding
- 1.1.23 Illustrate the application of hydrogen bonding – high boiling point of water, density of ice, silky nature of proteins (elementary idea only)

Acid-base & Redox reactions

- 1.4.0 Appreciate the reactions of acids & bases
- 1.4.1 Illustrate Arrhenius' & Lewis concept of acids and bases
- 1.4.2 Distinguish between strong and weak acids and bases
- 1.4.3 Explain neutralization
- 1.4.4 Illustrate the calculation of equivalent weights of acids and bases based on equations
- 1.4.5 Explain the electronic concept of oxidation & reduction
- 1.4.6 State oxidation number
- 1.4.7 Define the O.N concept of oxidation & reduction
- 1.4.8 Illustrate redox reactions taking the reactions in Daniel Cell as example

P^H & Its Applications

- 1.5.0 Understand the ionic product of water
- 1.5.1 State pH – understand its expression
- 1.5.2 Describe what is pH scale
- 1.5.3 Solve simple problems
- 1.5.4 Define buffer solutions
- 1.5.5 Describe what is acid buffer & basic buffer – one example each

Volumetric Analysis

- 1.6.0 Understand the theory behind volumetric analysis
- 1.6.1 Describe what is meant by the terms titration, end point & indicator
- 1.6.2 Identify the indicators phenolphthalein/methyl orange to be used in a given acid-base titration, know the respective pH ranges
- 1.6.3 Solve problems based on the relation $V_1N_1=V_2N_2$ & $V_1M_1 = V_2M_2$

Water

- 1.7.0 Understand hard & soft water- definition, types of hardness, its causes & certain methods of removal
 - 1.7.1 Distinguish between hard water & soft water
 - 1.7.2 Mention the types of hardness
 - 1.7.3 Explain methods of removal of hardness – one each (temp. – boiling, permanent – ion exchange)
 - 1.7.4 Define degree of hardness
 - 1.7.5 Explain the method of determination of degree of hardness using EDTA – principle, procedure & calculation
 - 1.7.6 Explain disadvantages of using hard water – wastage of soap in laundry, formation of boiler scales

UNIT - II PHYSICAL CHEMISTRY

Electrochemistry

- 2.1.0 Review the outline of electrolysis, distinguish between electrolytic cells & galvanic cells, identify corrosion as an electrochemical process
 - 2.1.1 Distinguish between a) conductors & insulators b) metallic & electrolytic conduction c) strong & weak electrolytes
 - 2.1.2 Explain electrolysis taking molten NaCl as example anode reaction & cathode reaction as oxidation & reduction.
 - 2.1.3 Explain the applications of electrolysis, electroplating & anodizing
 - 2.1.4 Distinguish between electrolytic cell & galvanic cell, the difference in the sign of the electrodes in the above cells
 - 2.1.5 Outline the schematic representation of galvanic cell
 - 2.1.6 Explain the classification of galvanic cells as primary & secondary
 - 2.1.7 Illustrate primary cell with Daniel cell as examples
 - 2.1.8 Illustrate secondary cell with lead storage cell as examples
 - 2.1.9 Explain the electrode reactions while recharging
 - 2.1.10 Explain the term electrode potential
 - 2.1.11 Define electrochemical series
 - 2.1.12 Illustrate the construction of a galvanic cell – minimum 3 examples
 - 2.1.13 Explain the concept of fuel cells (elementary idea only)
 - 2.1.14 Explain hydrogen-oxygen fuel cell & methanol-oxygen fuel cell
 - 2.1.15 Describe the chemical reactions in the cell
 - 2.1.16 Mention the advantages of fuel cells

Corrosion

- 2.2.0 Understand the concept of corrosion & identify it as an electrochemical process
 - 2.2.1 Define corrosion
 - 2.2.2 Explain the rusting of iron-mention the conditions for rusting
 - 2.2.3 Explain the electrochemical theory of corrosion
 - 2.2.4 Describe the methods of prevention of corrosion, barrier protection and sacrificial protection
 - 2.2.5 Explain the theory behind each method learned

Chemical Energetics

- 2.3.0 Appreciate the basic concepts of ‘Thermodynamics’ & ‘Chemical Thermodynamics’
 - 2.3.1 Explain the scope and limitations of thermodynamics
 - 2.3.2 Distinguish between a) reversible & irreversible reactions b) exothermic & endothermic reactions
 - 2.3.4 Explain ‘system & surroundings’
 - 2.3.5 Distinguish between open, closed & isolated systems
 - 2.3.6 Define macroscopic properties
 - 2.3.7 Distinguish between extensive & intensive properties

- 2.3.8 Describe the different thermodynamic processes like isothermal, adiabatic, isobaric & isochoric process
- 2.3.9 State the first law of thermodynamics
- 2.3.10 Explain internal energy E & ΔE
- 2.3.11 Explain the concept of work & heat
- 2.3.12 State the mathematical expression for the first law of thermodynamics
- 2.3.13 State Hess's Law – only statement & examples (solving problems not expected)
- 2.3.14 Describe the limitations of the 1st law
- 2.3.15 Explain the terms a) 'enthalpy' H & ΔH b) entropy S & ΔS
- 2.3.16 Describe spontaneous & non-spontaneous processes with suitable examples.
- 2.3.17 State 2nd law of thermodynamics
- 2.3.18 Explain Gibb's free energy G & ΔG
- 2.3.19 Derive the mathematical expression (only) for Gibb's – Helmholtz equation
- 2.3.20 State 3rd law of thermodynamics

Colloids

- 2.4.0 Comprehend the methods of preparation, the properties & some industrial applications of colloid
 - 2.4.1 Define 'colloids'
 - 2.4.2 Illustrate the different types of colloids with examples.
 - 2.4.3 Describe the method for the preparation of $\text{Fe}(\text{OH})_3$ sol
 - 2.4.4 Describe Bredic's Arc method
 - 2.4.5 Describe the purification of colloids by Dialysis
 - 2.4.6 Describe the properties 1) Tyndall effect 2) Brownian movement 3) electrophoresis 4) coagulation
 - 2.4.7 State Hardy-Schultze rule & explain with examples.
 - 2.4.8 Define Gold-No
 - 2.4.9 Describe the industrial applications – 1) smoke precipitation 2) sewage treatment 3) purification of drinking water

UNIT – III ORGANIC CHEMISTRY

Introduction to organic chemistry

- 3.1.0 Understand the fundamental ideas of organic chemistry
 - 3.1.1 List the differences between organic & inorganic compounds
 - 3.1.2 Describe the uniqueness of carbon atom
 - 3.1.3 Define 'catenation'
 - 3.1.4 Distinguish between saturated & unsaturated compounds
 - 3.1.5 Illustrate general classification & that based on functional groups
 - 3.1.6 Define isomerism – explain with simple examples only

Polymers

- 3.2.0 Understand the nature of some industrially important polymers
 - 3.2.1 Define polymerization
 - 3.2.2 Distinguish between addition & unsaturated compounds
 - 3.2.3 Differentiate between thermoplastics & thermosetting plastics
 - 3.2.4 Outline the merits & demerits of plastics
 - 3.2.5 Distinguish natural rubber from synthetic rubber with suitable examples
 - 3.2.6 Explain vulcanization & its merits
 - 3.2.7 Define "fiber"
 - 3.2.8 Describe different types of fibers with suitable examples

Paints, varnishes, adhesives & lubricants

- 3.3.0 Appreciate the requisites of good paints
 - 3.3.1 Name the constituents of paints – vehicle, pigment & other additive
 - 3.3.2 Identify the role of various additives – acrylics, polymethanes, fillers, plastizisers, driers, antiskinning agents (one examples each)
 - 3.3.3 List the two types of varnishes & their constituents
 - 3.3.4 State the common uses of varnishes

- 3.3.5 List the various constituents of varnish
- 3.3.6 Explain the principle of lubrication
- 3.3.7 List the types of lubricants – with one example each
- 3.3.8 Define ‘adhesives’
- 3.3.9 List the two types of adhesives
- 3.3.10 State the applications of 1) paper adhesive 2) wood adhesive 3) metal bonding adhesive 4) break & clutch bonding adhesive 5) printed circuits

Fuels

- 3.4.0 Comprehend the classification and use of various types of fuel.
 - 3.4.1 Define “fuel”
 - 3.4.2 Explain their classification into solid, liquid & gaseous
 - 3.4.3 Give brief explanation of solid fuels wood, charcoal, lignite, bituminous coal, anthracite coal – list their applications
 - 3.4.4 Explain briefly the liquid fuels petrol, diesel, kerosene & list their applications
 - 3.4.5 Explain gaseous fuels natural gas (CNG), producer gas, water gas, LPG & Gobar gas
 - 3.4.6 Describe nuclear fuels with examples
 - 3.4.7 Define 1) calorific value 2) octane number 3) Cetane no.
 - 3.4.8 Explain 1) knocking 2) cracking

Environmental pollution

- 3.5.0 Investigate the impact of pollution on the environment
 - 3.5.1 Describe the categorization and sources
 - 3.5.2 List the different methods of controlling pollution
 - 1) Effluent treatment 2) removal of toxic gases and particulate materials
 - 3.5.3 Distinguish between BOD & COD

Chemistry in action

- 3.6.0 Understand some commonly used medicines & propellants
 - 3.6.1 Explain what is 1) dyes 2) antipyretics & analgesics 3) antiseptics & disinfectants 4) tranquilizers 5) antibiotics - mention 2 examples each
 - 3.6.2 Define propellants
 - 3.6.3 Classify propellants with one example each.

CONTENT DETAILS

UNIT – I INORGANIC AND THEORETICAL CHEMISTRY

1.1 Introduction

Atoms and Molecules, Valency, Molecular formula, Atomic weight, Molecular weight, Chemical equation, Problems based on Chemical equation.

Structure of atom, Modern approach De-broghi & Heisenberg’s uncertainty Principle (Elementary idea only) – Concept of Orbit, orbital, Aufbau, Hund, Pauli’s Principle – Electronic configuration – Modern Periods Law - classification of elements based on electronic configuration.

Chemical Bonding - theory of valency – Inertness of Zero group elements - Ionic bond, Coordinate bond, Co-valent bond, Polar character of covalent bond – Hydrogen bond – Applications High B.P of Water, density of ice, silky nature of protein (Idea only).

1.2 Acids-bases and Redox reactions

Acids-Bases – (Arrhenius, & Lewis Concepts) – Concepts of strong and weak acids & bases – Neutralization - Equivalent weight of acid & bases (Calculate based on Equation) -Oxidation, Reduction (electronic concept and oxidation No concept) - Redox reaction (Eg: - Daniel Cell reaction).

Ionic product of water, PH & POH (Definition and expression) PH Scale – Calculation of PH & POH – Buffer solution (examples) – Application of PH a) Boiler feed water b) Potable water c) Effluent treatment.

Volumetric analysis: Quantitative & Qualitative analysis – Units of measurement of Concentration (Normality, Molarity & PPM) – Titration, Endpoint Acid – Base Indicators (Phenolphthalein & Methyl orange) – Choice of Indicators.

1.3 Water

Hard & soft water, Types of Hardness – degree of hardness. One method to remove Temporary hardness (Boiling) – Renormal of permanent hardness (Ion-exchange method) – disadvantages of using hard water a) Wastage of Soap in laundry) Boil Scales – Determination of Degree of hardness using EDTA (Principle & Procedure only).

(Problems not expected from the chapter)

UNIT – II PHYSICAL CHEMISTRY

2.1 Electrochemistry & corrosion

Conductors & Insulators, Metallic & electrolyte conductors, strong & weak electrolytes – Mechanism of electrolysis – Molten Nail – Application of electrolysis – Electroplating & Anodizing.

Galvanic cell – Difference in the sign of electrodes – Primary cell (eg: - Daniel cell construction details, Anode reaction, cathode reaction & Net cell reaction)

Secondary cells – Lead storage battery, (Constructional details – charging & discharging)

Electrochemical series – Application in the construction of a cell.

Fuel cells – Introduction, Hydrogen – Oxygen fuel cell, Methanol – Oxygen fuel (elementary idea only) – Advantages.

2.2 Corrosion

Definition – Rusting of Fe condition for Rusting of Fe, Electrochemical theory of corrosion, Preventing of corrosion

- i) Barrier protection
- ii) Sacrificial protection
- iii) Cathodic protection
- iv) Antirust solution.

2.3 Chemical Energetics

Understand the term chemical energetic & thermodynamics – Scope & Limitations of Thermodynamics. Basic concepts – Reversible & Irreversible reaction, Exothermic & endothermic reactions, systems & surroundings – Types of systems Open, closed, Isolated – process – Macroscopic properties – Extensive & Intensive properties.

Thermodynamic process - Isothermal, Adiabatic, Isobaric, Isochoric Process.

First Law of Thermodynamics – (statement)

Internal energy (E) and Internal energy change (E)

Concept of Work & heat

Mathematical expression for the 1st Law of thermodynamics

Application of 1st Law (Hess's Law)

(Statement and eg), Limitation of 1st Law.

Enthalpy (H) and Enthalpy Change (H), Entropy (S) and Entropy Change (S)

Second Law of Thermodynamics (statement & Mathematical Expression)

Gibbs Free energy (G) and Gibbs free energy change (AG)

Gibbs-Helmholtz equation (expression only)

Third Law of Thermodynamics (statement only)

2.4 Colloids

Definition, Types of colloids, preparation 1) Condensation-e.g. Ferric hydroxide sol 2) Dispersion- e.g. Bredig's arc method, purification – dialysis, Properties. 1. Tyndall effect 2. Brownian movement 3. Electrophoresis 4. Coagulation Hardy – Schulze rule, Gold number Industrial application 1) Smoke precipitation 2) Treatment of sewage 3) Purification of drinking water.

UNIT – III ORGANIC CHEMISTRY

3.1 Introduction

Differences between organic and inorganic compounds – uniqueness of carbon – catenation, saturated and unsaturated – general classification of organic compound – classification based on functional groups isomerism (definition with an example).

3.2 Polymers

Polymerization – illustrate with examples – Addition and condensation polymerization with one example each.

3.3 Plastics - Thermoplastics, Thermosetting plastic, with one example each – advantages.

3.4 Rubber – Natural and synthetic rubber (example), vulcanization.

3.5 Fiber – Natural fibers, synthetic fibers, semi synthetic fibers, examples.

3.3 Paints and Varnishes and adhesives, lubricants

Requisites of a good paint – Constituents – acrylics, polyurethane, filler, plasticizers, pigments, driers and antiskinning agents.

VARNISHES - Type, Constituents

LUBRICANTS - Principle of lubrication – Types of lubricants

ADHESIVES - Types and Applications.

3.4 Fuels

Types of fuels - solid, liquid, gaseous and nuclear - Calorific value of fuels. Knocking, Cracking - Octane number and octane number.

3.5 Environmental pollution

Categorization, Sources and Controlling.

3.6 Chemistry in action:

Dyes – antipyretics and analgesics – antiseptic – disinfectant – tranquilizers – antibiotics (Concept and two examples each). Propellants – definition classification (solid – liquid – hybrid) one example each.

REFERENCE BOOKS

- | | | | |
|----|-------------------------|------------------------------------|-----------------------------|
| 1. | Soni P.L. | A Text Book of Inorganic Chemistry | S.Chand & Co., New Delhi |
| 2. | Puri B.L. & Sharma L.R | A Text Book of Inorganic Chemistry | Shoban Lal Nagin Chand&Co |
| 3. | B.S.Bahl | Text book of Organic Chemistry | S.Chand & Co., New Delhi |
| 4. | I.L. Finar
Arun Bahl | Organic Chemistry – Vol I | ELBS & Longman, Group Ltd., |
| 5. | Sono. P.L. | Textbook of physical Chemistry | Sultan Chand & Sons, New |
| 6. | A.J. Mee | Physical Chemistry | William Heinemann Ltd., |
| 7. | Glasstone & Lewis | Element of Physical Chemistry | Macmillan Press |

SUBJECT TITLE : ENGINEERING GRAPHICS
SUBJECT CODE : GE 104
PERIOD/WEEK : 4
PERIOD/YEAR : 128

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	1.1 Importance of Engineering Graphics	2
	1.2 Drawing Instruments	2
	1.3 Drawing standards	2
	1.4 Free hand Lettering and Numbering	3
	1.5 Dimensioning	3
	1.6 Geometric construction	16
	Test 1	3
		----- 31
II	2.1 Projection of Points, Lines and planes	18
	Test 2	3
III	3.1 Orthographic Projection of Objects	27
	Test 3	3
IV	4.1 Sectional views of objects	11
	4.2 Auxiliary views	3
	Test 4	3
V	5.1 Pictorial Drawing	8
	5.2 Visualization	4
	5.3 Perspective Drawing	3
	5.4 Development of surfaces	11
	Test 5	3
		----- 29
Total		128 Periods

Note : A minimum number of 10 sheets should be done.

OBJECTIVES

UNIT - I

On completion of this study the student should be able to –

1.1 Importance of Engineering Graphics

- 1.1.0 Understand the importance of engineering graphics
 - 1.1.1 Explain the importance of engineering communication medium
 - 1.1.2 Describe the development of engineering graphics and computer aided drafting CAD
 - 1.1.3 Indicate the link between engineering graphics and other subjects of study in diploma courses

1.2 Drawing Instruments

- 1.2.0 Use engineering drawing instruments
 - 1.2.1 Select the proper instrument to draw horizontal, vertical and inclined lines
 - 1.2.2 Select the proper instrument to draw large and small circles and arcs to its specifications
 - 1.2.3 Select the proper pencil to draw different types of line according to its specifications
 - 1.2.4 Identify the steps to keep the drawing clean and tiny

1.3 Drawing standards

- 1.3.0 Appreciate the standards of engineering drawing
 - 1.3.1 Select the drawing sheet
 - 1.3.2 Draw different types of lines
 - 1.3.3 Prepare of title block as per BIS
 - 1.3.4 Fold of drawing sheets as per standards

1.4 Free hand Lettering & Numbering

- 1.4.0 Apply free hand lettering and numbering
 - 1.4.1 Write drawing tile using sloping and vertical lettering including numerals as per BIS
 - 1.4.2 Select suitable size of letters of different layout and applications
 - 1.4.3 Write engineering drawings notes using lettering stencils

1.5 Dimensioning

- 1.5.0 Apply dimensioning as per standards
 - 1.5.1 State the need of dimensioning as per BIS specification
 - 1.5.2 Identify the notations used in a drawing as per BIS
 - 1.5.3 Identify the system of placement of the dimensions as per BIS
 - 1.5.4 Dimension of a given drawing according to BIS including features
 - 1.5.5 Apply the rules for dimensioning of standard features, given a drawing comprising of standard features
 - 1.5.6 Identify principles of dimensioning, given a dimensioned drawing
 - 1.5.7 Identify the correctness or otherwise of an engineering drawing dimensioned as per SP 46 and dimension the same correctly

1.6 Geometric construction

- 1.6.0 Apply principles of geometrical construction
 - 1.6.1 Construct polygon, given the length of the side
 - 1.6.2 Insert a regular polygon in a circle.
 - 1.6.3 Define Ellipse, involutes, helix, Parabola, Hyperbola and Cycloid,
 - 1.6.4 Construct Ellipse by different methods (concentric, eccentricity, parallelogram
 - 1.6.5 Construct an involute, helix, parabola from given data
 - 1.6.6 Identify the application of these constructions in engineering practice.

UNIT – II

2.1 Projection of Points, Lines and Planes

- 2.1.0 Understand the projection of points, lines and planes
 - 2.1.1 Project points in different quadrants
 - 2.1.2 Project lines parallel to both planes
 - 2.1.3 Project lines perpendicular to HP and || to VP

- 2.1.4 Project lines perpendicular to VP and || to HP
- 2.1.5 Project lines inclined to HP and || to VP
- 2.1.6 Project lines inclined to VP and || to HP
- 2.1.7 Project lines inclined to both planes-simple direct questions and answers
- 2.1.8 Find true length of lines
- 2.1.9 Project of planes parallel to VP and perpendicular to HP
- 2.1.10 Project planes parallel to HP and perpendicular to VP

UNIT - III

3.1 Orthographic Projection of Objects

- 3.1.0 Apply principles of orthographic projection
 - 3.1.1 Explain the principle of orthographic projection with simple sketches
 - 3.1.2 Prepare an engineering drawing of a given simple engineering path in first angle and third angle projection
 - 3.1.3 Draw the orthographic views of an object, given its pictorial drawing
 - 3.1.4 Sketch (free hand) the orthographic views of 3.2 and 3.3
 - 3.1.5 Select the minimum number of views needed to represent a given object fully
 - 3.1.6 Identify the engineering path correctly from a number of orthographic drawings

UNIT - IV

4.1 Sectional views of objects

- 4.1.0 Recognize the need of sectional views
 - 4.1.1 Explain the need to draw sectional views
 - 4.1.2 Select the section place for a given component to reveal maximum information
 - 4.1.3 Draw the sectional views for 4.2
 - 4.1.4 Sketch simple sections (Full and half) for a range of simple engineering objects
 - 4.1.5 Select the component from a given sectional view

4.2 Auxiliary views

- 4.2.0 Recognize the need of auxiliary views
 - 4.2.1 State whether the auxiliary view is needed, given an engineering drawing
 - 4.2.2 Draw the auxiliary views of a given engineering drawing

UNIT - V

5.1 Pictorial Drawing

- 5.1.0 Prepare pictorial drawing
 - 5.1.1 Explain the need for and types of commonly used pictorial drawings
 - 5.1.2 Prepare isometric drawing of simple objects using appropriate construction procedures given their appropriate drawings
 - 5.1.3 Sketch the isometric views of simple engineering objects given either orthographic drawing or actual components
 - 5.1.4 Prepare oblique drawing – cavalier and cabinet-of simple engineering objects given either orthographic drawings or actual components
 - 5.1.5 Sketch 5.4 by free hand
 - 5.1.6 Identify the correct pictorial view from orthographic drawings

5.2 Visualization

- 5.2.0 Visualize and object in 3D, given its orthographic drawings
 - 5.2.1 Compare an engineering part with its drawings
 - 5.2.2 Identify surfaces with reference to orthographic drawing
 - 5.2.3 Prepare a model of the part, given its orthographic drawing

5.3 Perspective Drawing

- 5.3.0 Prepare perspectives
 - 5.3.1 State the principle of perspective projection
 - 5.3.2 Prepare two-point perspective of a rectangular block
 - 5.3.3 Sketch perspective of combination of rectangular block

5.4 Development of surfaces

5.4.0 Prepare development of surfaces

5.4.1 State the need for preparing the development drawings

5.4.2 Prepare development of surfaces of simple engineering component like tray, funnel, ducts (rectangular and square hopper)

5.4.3 Prepare development of surfaces of 90-degree elbow pipe

CONTENT DETAILS

UNIT - I

1.1 The Importance of Engineering Graphics

Explanation of the scope and objective of this subject – its importance as a graphic communication, Computer Aided Drafting (CAD) need for preparing drawing as per standards – BIS, SP 46.

1.2 Drawing Instruments.

Basic drawing instruments – T square – Set square – compass dividers – drawing boards – Pencils – Drawing papers – Mini drafter – French curves – Stencils – Selection and mode of using them.

1.3 Drawing Standards

Size of drawing sheets – Layouts of drawing sheet – Title Blocks – Types of lines – Folding of drawing sheets.

1.4 Free hand Lettering and Numbering

Need for legible lettering and numbering on drawings – selection of suitable size of lettering for different drawing writing of Engineering drawing titles and notes using both vertical and sloping styles.

1.5 Dimensioning

Function of dimensioning need for dimensioning engineering drawing according to BIS – rotation used in dimensions – dimension line – extension line – arrow heads and leader – system of dimensions - method I and method II

1.6 Geometric construction

Construction of regular polygon given the length of its side - methods of inserting a regular Polygon in a given circle – construction of ellipse by different methods (eccentrically, concentric circle, parallelogram). Definition of involute, helix, parabola & hyperbola – Construction of cycloid helix, involute and parabola.

UNIT – II

2.1 Projection of points, lines and planes

Projection of points in different quadrants, projection of straight lines parallel to one or both planes, parallel to one plane –perpendicular to other – inclined to one plane and parallel to other line inclined to both planes (In first quadrant only)

Methods of finding true length and its inclination with the reference planes. Projection of planes – parallel to one plane and perpendicular to other plane (in first quadrant only)

UNIT - III

3.1 Orthographic projection of objects

Explanation of the meaning of orthographic projection using a viewing box and a model- number views obtained need of only three views for displaying the object. Concept front view, top view and side view-sketching these views for a number of engineering objects- explanation of the meaning of first angle and third angle projection – symbol of projection

UNIT - IV

4.1 Sectional views of objects

Need for sectional drawing of an engineering object- selection of the section plane to reveal the maximum information – sectional views (full and half section) of simple engineering objects.

4.2 Auxiliary views

Need of auxiliary views – auxiliary views given engineering drawings

UNIT - V

5.1 Pictorial drawings

Isometric projection, construction of isometric scales- isometric projection of simple Engineering objects

Oblique projection cavalier and cabinet of simple Engineering objects

5.2 Visualization

Preparation of pictorial views from a group of orthographic drawings

5.3 Perspective drawing

Principle of perspective projection – type of perspective projection – two-point perspective of a rectangular block and combination of two rectangular blocks of different sizes

5.4 Development of surfaces

Development of surfaces of simple engineering components trace-funnel, ducts-rectangular and square –hopper-90 degree Elbow

REFERENCE BOOKS

- | | |
|-------------------------|------------------|
| 1. Engineering Drawing | - N. D Bhutt |
| 2. Engineering Graphics | - K. C. John |
| 3. Engineering Graphics | - P. I. Varghese |

**SUBJECT TITLE : COMPUTER FUNDAMENTALS & PROGRAMMING
IN C**
SUBJECT CODE : GE 105
PERIODS/WEEK : 3
PERIODS/YEAR : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	1.1 Introduction to Computers	12
	1.2 Windows & Word Processing	6
	Test 1	2
II	2.1 Data Processing	5
	2.2 Problem solving methodology	11
	Test 2	2
III	3.1 Introduction to C Programming	12
	3.2 Programming practice	6
	Test 3	2
IV	4.1 Arrays, strings & functions	12
	4.2 Programming practice	6
	Test 4	2
V	5.1 Graphics in C	7
	5.2 Computer Networks	3
	5.3 Programming practice	6
	Test 5	2
	TOTAL	96

OBJECTIVES

UNIT – I

1.1.0 Know the application, classification and working of computers

- 1.1.1 Define a Computer
- 1.1.2 Discuss the various applications of computers
- 1.1.3 List the different classifications of computers based on processing methods
- 1.1.4 Describe the working of analog, digital and hybrid computers

1.2.0 Appreciate the functions of hardware and software components

- 1.2.1 Define hardware and software
- 1.2.2 Discuss about Instruction and program
- 1.2.3 Describe the hardware functional components of a digital computer with the help of a block diagram
- 1.2.4 List the functions of ALU, Memory, Input, Output Units and Control Unit
- 1.2.5 Define CPU and Microprocessor
- 1.2.6 List the classifications of computers based on capability
- 1.2.7 Describe micro, mini, mainframe and supercomputers in brief
- 1.2.8 Discuss machine language, Assembly language and high level language

- 1.2.9 List the different software components
- 1.2.10 Define system software and application software
- 1.2.11 Give examples for system software and application software
- 1.2.12 State the need for translators – assembler, compiler
- 1.2.13 Define operating system
- 1.2.14 List the functions of operating system
- 1.2.15 List the names of various operating system

- 1.3.0 **Appreciate the working of memory and input – output devices**
- 1.3.1 Define memory
- 1.3.2 Discuss the units' bit, byte, kilobyte, megabyte, gigabyte etc.
- 1.3.3 Discuss the characteristics of primary memory and secondary memory
- 1.3.4 Distinguish between sequential access memory and Random Access Memory
- 1.3.5 Differentiate between Read Only Memory and Read/Write memory
- 1.3.6 Discuss RAM & ROM
- 1.3.7 List the different types of ROM
- 1.3.8 List the different secondary memory devices
- 1.3.9 Discuss the working of floppy disk, magnetic tape, Hard disk, Compact disk (block diagrams and detailed description not necessary)
- 1.3.10 Discuss working of CDRom, CD-R, CD-RW & DVD (block diagrams and detailed description not necessary)
- 1.3.11 List the names of various I/O devices
- 1.3.12 Discuss input devices – Keyboard, mouse, scanner, Optical Character reader, Optical Mark reader, bar code reader, digitizer, light pen, joystick in brief (block diagrams and detailed description not necessary)
- 1.3.13 Discuss output devices – monitor, Printer, plotter (block diagrams and detailed description not necessary)
- 1.3.14 Describe the printers – Dot matrix printer, Inkjet printer, Laser printer in brief (block diagrams and detailed description not necessary)

- 1.4.0 **Use the provisions of windows o s and word processing**
- 1.4.0 Define Booting
- 1.4.1 Define Booting
- 1.4.2 Demonstrate the features of Windows Operating System
- 1.4.3 Operate various facilities in windows- 95 or higher version such as Desktop, icon, menu, folder, programs, screen saver, media player, shut down procedure
- 1.4.4 Discuss word processing
- 1.4.5 Prepare documents using WORD - create, format, save, print and open documents
- 1.4.6 Prepare presentations using power point – creation and use of slide show presentations

UNIT – II

2.1.0 Use data processing techniques and DBMS (not for theory exam)

- 2.1.1 Define Data, Database, and Database management system
- 2.1.2 Define Data, Database, and Database management system
- 2.1.3 State the need of spreadsheet
- 2.1.4 List the name of electronics spreadsheet and DBMS software packages
- 2.1.5 Use Excel for the creation, formatting, formula, save, print, open close and exit worksheets
- 2.1.6 Use Access for the creation, editing and querying of tables
- 2.2.0 **Understand problem solving methodology**
- 2.2.1 List the various steps involved in problem solving
- 2.2.2 Define what is an Algorithm
- 2.2.3 Write Algorithm for solving general and computer related problems
- 2.2.4 Define what is a Flow chart
- 2.2.5 Discuss the different flow-charting symbols
- 2.2.6 Draw flow chart for solving general and computer related problems

- 2.2.7 Define syntax and semantic of programming languages
- 2.2.8 List the name of two programming methods
- 2.2.9 Discuss the characteristics of procedural and object oriented programming languages
- 2.2.10 Give examples for procedural and object oriented language

UNIT – III

3.1.0 Use ‘C’ language in programming

- 3.1.1 Discuss the characteristic of C language
- 3.1.2 Describe the structure of a C program
- 3.1.3 State the need for header files, main ()
- 3.1.4 Discuss the basic data types in C –int., float, and double char
- 3.1.5 Discuss about identifiers, keywords and declaration of identifiers
- 3.1.6 Discuss about statements and compound statements
- 3.1.7 Describe briefly assignment, arithmetic operators, increment-decrement operators and arithmetic expressions
- 3.1.8 Discuss operator precedence and rules for evaluation of an expression
- 3.1.9 State the need of stdio.h
- 3.1.10 Discuss various input and output statements-printf(), scanf(), getchar(), Puchar (), getchar ()
- 3.1.11 Discuss the need of various control sequences and escape sequences
- 3.1.12 Write simple programs using input/output assignment and arithmetic statements
- 3.1.13 Describe the relational operators and relational expressions with their precedence in brief
- 3.1.14 Describe logical operators with their precedence in brief
- 3.1.15 Write programs with relational operators and logical operators

3.2.0 Prepare programs involving branching and looping statements

- 3.2.1 State the need for branching statements
- 3.2.2 Describe IF, IF ELSE statement, nested IF and IF Ladder
- 3.2.3 Describe the Switch Statement
- 3.2.4 Write Programs using IF Else and Switch statement
- 3.2.5 State the need for looping statements
- 3.2.6 Discuss the method of looping using While, Do and for loops
- 3.2.7 Write programs using While, Do and For loops

UNIT – IV

4.1.0 Create arrays and strings

- 4.1.1 State the need of arrays
- 4.1.2 Discuss the method declaring arrays and subscripting in arrays
- 4.1.3 Discuss the method of inputting, processing, and outputting values of array element
- 4.1.4 Write program for array processing
- 4.1.5 Write program for linear search and bubble sort
- 4.1.6 Discuss about multidimensional arrays
- 4.1.7 Write programs on multidimensional arrays, matrices manipulation
- 4.1.8 Discuss the declaration of character string
- 4.1.9 Discuss various string input and output functions – gets() and puts()

4.2.0 Understand functions in ‘C’ language

- 4.2.1 State the need for function
- 4.2.2 Compare user defined and library functions
- 4.2.3 Discuss the structure of a user defined function and its calling with or without parameters
- 4.2.4 Define void function
- 4.2.5 Describe various library functions – sin (), cos(),tan(),exp(), abs(), log(),log10(), POW(), sqrt(), - strlen (), strcpy (), strcmp (), strcat ()
- 4.2.6 Write simple programs on functions and strings

UNIT – V

5.1.0 Use computer graphics in ‘C’ language to prepare programs

- 5.1.1 State the use of graphics.h
- 5.1.2 Define resolution
- 5.1.3 Discuss the functions initgraph(), setcolor(), setbkcolor(), putpixel(), line(), circle(), rectangle(), outtexty()
- 5.1.4 Write programs based on graphics

5.2.0 Understand new trends in information technology

- 5.2.1 Define the work 'multimedia'
- 5.2.2 Define the word 'multimedia'
- 5.2.3 Discuss the components required for a multimedia personal computer
- 5.2.4 Define computer network
- 5.2.5 Define LAN, WAN
- 5.2.6 Discuss the concept of Server and nodes
- 5.2.7 Discuss Internet, World Wide Web, and e-mail
- 5.2.8 Discuss Computer virus and anti-virus programs
- 5.2.9 Define artificial Intelligence and discuss its application fields

CONTENT DETAILS

UNIT – I Introduction to Computers & Word Processing

Introduction, application of computers, generations of computers, classification of computers – analog, digital, hybrid Computers, Structure of a computer - Hardware and Software components – Input unit, Output unit, ALU, Memory unit, Control unit, CPU, Microprocessor, micro, mini, supercomputers – machine languages, assembly languages, high level languages – system software, application software – assembler, compiler, operating system – Types of memory – primary memory, secondary memory, sequential access, random access memory, RAM, ROM – magnetic tape, floppy, hard disc, compact disc – input devices, output devices.

Practical sessions on Windows O/S, Word, Power point

UNIT – II Data Processing and Programming Methodology

Practical session on Electronic spread sheet and DBMS – EXCEL, ACCESS

Steps in problem solving – Algorithm, Flowchart- Flow chart symbols- examples syntax, semantics- types of high level languages – characteristics of high level languages - Types of high level languages – Examples – Procedural and object oriented programming languages

UNIT – III Introduction to C Programming

Characteristics of C-language – structure of a program header files, main (), Statements, compound statements, Data types – Keyword and variables, assignment operators, arithmetic operators, expressions, precedence of operators, order of evaluation – relational and logical operators - Input /output statements – control sequences – escape sequences – branching statements, if, if-else, switch – looping statements while, do, for statements.

Writing Sample programs – Practical session on programming

UNIT – IV Arrays and Functions

Arrays – declaration, processing, searching, sorting – linear search, bubble sort – multi dimensional arrays- matrix manipulations, character strings, string declaration, input/output functions gets (), puts ()

User defined functions – library functions – structure of functions, calling functions, argument passing, void functions – mathematical and string library functions – math.h, stdio.h, string.h

Writing programs – Practical session on programming

UNIT – V Graphics and Networking

C-Graphics – resolution – graphics functions – initgraph (), setcolor (), setbkcolor (), putpixel (), Line (), circle (), rectangle (), out text (), outtextxy ()

Multimedia – Computer networking

LAN, WAN- Internet, modem, www-E-mail, computer virus, artificial intelligence.

REFERENCE BOOKS

1. Brian w. Kernigham and Dennys M. Ripchie The ‘C’ programming Language PHI
2. Hughes J. K. and Michton J. I. A structured approach to Programming PHI
3. Gottfried.B Theory and problems Programming with C TMH
4. E. Balaguruswamy Programming ANSI C TMH
5. Robert A. Radcliffe Encyclopedia C BPB

SUBJECT TITLE : BASIC ELECTRICAL AND ELECTRONICS
SUBJECT CODE : CT 101/EL 101/EP 101/EI 101/IT 101
EC 101/CHM101/INF 101
PERIODS/WEEK : 4
PERIODS/YEAR : 128

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Passive Components, A.C. Fundamentals, Poly-phase circuits & Network Theorems	28
	Test 1	1
II	Semi conductors, PN junction Diodes Different types of diodes	20
	Test 2	1
III	Diode circuits, Introduction to Transistors	25
	Test 3	1
IV	Transistor configuration & Biasing Techniques	25
	Test 4	1
V	Special type of Transistors, Power devices & Opto-Electronic devices	25
	Test 5	1
	Total	----- 128 =====

OBJECTIVES

UNIT – I

1.1.0 Understand the different types of resistors and their uses

- 1.1.1 Define the property of resistance
- 1.1.2 List the specifications of resistors and state their importance
- 1.1.3 Classify types of resistors
- 1.1.4 List the applications of fixed resistors, variable resistors in electronic circuits.
- 1.1.5 Explain the working of PTC and NTC resistors and their application.

1.2.0 Familiarize with capacitors used in electronic circuits and their applications

- 1.2.1 State the charging and discharging of capacitors
- 1.2.2 List the specification of a capacitor and state their importance
- 1.2.3 Classify capacitors
- 1.2.4 Explain the working of capacitors
- 1.2.5 State the application of each type of capacitors
- 1.2.6 List the use of gang condensers, trimmers, pads.

1.3.0 Familiarize with different types of inductors, transformers and their applications

- 1.3.1 List the different types of inductors and their applications
- 1.3.2 Explain the working principle of a transformers
- 1.3.3 List the types and applications of transformers

1.4.0 Understand the basic network theorems

- 1.4.1 Explain superposition theorem, Thevenin's theorem, Norton's theorem, reciprocity theorem and maximum power transfer theorem

1.5.0 Understand the fundamentals of alternating current

- 1.5.1 Define waveform, time period frequency, and amplitude, phase difference r.m.s. Value, average value
- 1.5.2 Derive the equation of sinusoidal voltage and current
- 1.5.3 Explain A.C. through resistors, inductors and capacitors
- 1.5.4 Define Q-factor of a coil
- 1.5.5 Define resonance in R-L-C (Series & parallel circuits)
- 1.5.6 State the inductive reactance, capacitive reactance and impedance
- 1.5.7 Explain the generation of 3ϕ voltage equations, phase difference λ vector representation
- 1.5.8 Define line voltage and current, phase voltage and current in 3ϕ system
- 1.5.9 Explain circuits the use of star & Delta connections.

UNIT – II

2.1.0 Recognize the semiconductor materials & devices

- 2.1.1 Sketch Energy Band diagrams of conductors, insulators & semiconductors
- 2.1.2 Distinguish between intrinsic & extrinsic semiconductors
- 2.1.3 State the majority & minority carriers in P, N type materials
- 2.1.4 Explain the term doping
- 2.1.5 Explain the formation of PN junction diode, depletion region
- 2.1.6 Distinguish between drift & diffusion currents
- 2.1.7 Describe potential barrier
- 2.1.8 Sketch V-I characteristics of diode
- 2.1.9 Describe Zener & Avalanche Breakdown of diodes
- 2.1.10 Explain the determination of static & dynamic resistance of diode
- 2.1.11 Explain the specifications of diodes

2.2.0 Recognize different types of diodes

- 2.2.1 Explain the working & VI characteristics of Power, Zener, Varactor & Tunnel diodes
- 2.2.2 Describe important specifications of diodes
- 2.2.3 Describe applications of Power diodes, Zener diodes, Varactor diodes & Tunnel diodes

UNIT – III

3.1.0 Appreciate the principle of rectification and filtering

- 3.1.1 State the working of a diode and a rectifier
- 3.1.2 Draw half wave and full wave rectifier circuits including bridge rectifier and explain their working
- 3.1.3 Draw the relationship between DC output and AC input voltage
- 3.1.4 Define the terms rectification efficiency, ripple factor
- 3.1.5 Calculation of average and r.m.s values of voltages and currents for various rectifiers
- 3.1.6 Draw the filter circuits, different types, shunt capacitor, series inductor and π section filters and explain their working
- 3.1.7 Draw the different wave shapes
- 3.1.8 Draw the voltage Doublers and Tripler circuit and state principle of working

3.2.0 Understand the concept of transistor

- 3.2.1 Explain the working of PNP & NPN transistor
- 3.2.2 Draw the mechanism of current flow and current relation $I_E = I_B + I_C$
- 3.2.3 State the meaning of leakage current and effect of temperature

UNIT – IV

4.1.0 Understand different configurations of transistors

- 4.1.1 Draw the different configuration of transistor
- 4.1.2 Sketch the input and output characteristics of CB & CE Configuration
- 4.1.3 Determination of i/p & o/p resistance from characteristic curves
- 4.1.4 Compare the different configurations of transistor

- 4.1.5 Define and relate the term Gama and Beeta factors
- 4.2.0 Understand different biasing techniques of transistors**
 - 4.2.1 Sketch DC Load line
 - 4.2.2 Define operating point
 - 4.2.3 Explain the need for stabilization of operating point
 - 4.2.4 Study the different biasing circuits
 - 4.2.5 Study the behavior of CE amplifier with potential divider biasing.

UNIT – V

5.1.0 Understand the operation of UJT

- 5.1.1 Study the operation of UJT, VI characteristics & symbol
- 5.1.2 Equivalent circuit of UJT & its Application

5.2.0 Translate the principle of operation of FET

- 5.2.1 Draw the Basic construction of JFET, P-channel and N-channel
- 5.2.2 State the principle of operation and the characteristics of JFET
- 5.2.3 Compare FET with Bipolar Transistor
- 5.2.4 List the advantages and disadvantages
- 5.2.5 List the parameters of JFET
- 5.2.6 Applications of JFET
- 5.2.7 Classify MOSFET such as depletion and enhancement modes
- 5.2.8 Compare JFET and MOSFET
- 5.2.9 Application of MOSFET

5.3.0 Appreciate the concept of integrated circuit

- 5.3.1 Study the basics of integrated circuits
- 5.3.2 List the advantages
- 5.3.3 State the needs for SMD & list the advantages

5.4.0 Recognize the different types of opto electronic devices

- 5.4.1 State the working principles of photo resistors, photodiodes, phototransistors, photovoltaic cells, LEDs, LCDs, and Opto couplers
- 5.4.2 Explain simple application of Opto electronic devices.

CONTENT OUTLINE

UNIT – I:

PASSIVE COMPONENTS, A.C FUNDAMENTALS, POLY-PHASE CIRCUITS & NETWORK THEOREMS

Fixed resistors, variable resistors and their specifications – PTC and NTC resistors, High precision resistors, applications. Capacitors – charging & discharging specification, different types of capacitors, variable capacitors, application of capacitors. Inductors – AFC & RFC, Transformers, pulse transformer, applications.

Equations of sinusoidal voltage & current, waveforms, time period, frequency, amplitude, phase difference, r.m.s value, average value, A.C. through Resistors, Inductors and Capacitor, inductive reactance, capacitive reactance and impedance. Q-factor, resonance in R.L.C. (Series & parallel).

Network theorem's – Superposition theorem, Thevenin's theorem, Reciprocating theorem, Norton,s theorem, Maximum power transfer theorem.

Poly-phase circuits – generation of poly phase voltage, equations, phase difference, e m f vector representation, comparison between single & 3 phase systems, star & delta connections, relations of voltage & current in star/delta connections, expression for power in 3 phase systems – simple problems.

UNIT – II:

SEMI CONDUCTORS, PN JUNCTION DIODES, DIFFERENT TYPES OF DIODES.

Energy band diagram of conductors, insulators, semiconductors, intrinsic & extrinsic semiconductors, doping, P&N type, majority & minority carriers. PN junction, drift & diffusion current, depletion layer, potential barrier, behaviour of PN junction under forward & reverse bias, break down on diodes, Zener & avalanche breakdown. VI characteristic of PN junction diode, determination of static and dynamic resistance, specification of diode

Different types of diodes – brief description, working & VI characteristics of power, zener, varactor and tunnel diodes. Important specification & applications

UNIT – III:

DIODE CIRCUITS, INTRODUCTION TO TRANSISTORS

Working of the diode as a rectifier, half wave & full wave rectifiers, bridge rectifiers. Relation between D.C output and A.C output voltage, rectification efficiency & ripple factor, average & r.m.s values of voltage & current for various rectifiers. Filter circuits, shunt capacitor, series inductance and section filter circuits, applications. Voltage Doubler & Tripler circuits operations.

Concept of bipolar transistor PNP & NPN transistor – Mechanism of current flow, current relation ($I_E = I_B + I_C$). Concept of leakage current (I_{CBO}) and effect of temperature on leakage current.

UNIT – IV:

TRANSISTOR CONFIGURATION AND BIASING TECHNIQUES

CB Configuration leakage current, input & characteristics, determination of dynamic input & output resistance, CE configuration, current relation (Collector current in terms of base current & leakage current I_{CED}), Input & output characteristics, determination of input & output resistance.

CC configuration – expression of emitter current in terms of base current and leakage current

Comparison of CB, CE & CC with regards to input & output impedances, current gain, voltage gain & leakage current.

Transistor biasing techniques – DC load line – Fixing the operating point, Need for stabilization.

Different biasing methods – Working of a single stage CE transistor amplifier.

UNIT – V:

SPECIAL TYPE OF TRANSISTORS, POWER DEVICES & OPTO ELECTRONICS DEVICES.

UJT, Operation, VI characteristics, Equivalent circuit, Applications. FET, advantages and disadvantages, Basic construction of JFET, Principle and operation of JFET, Parameters of JFET, Applications.

MOSFET, Depletion MOSFET, Enhancement MOSFET, Application.

Difference between JFET & MOSFET

Power devices – SCR, diac & triac

Introduction to Integrated ckt technology, Advantages, SMD's and its advantages

Opto electronic devices – working principles of photo resistors, photodiodes, phototransistors, photovoltaic cell, LED, LCD & Opto couplers – simple application of opto electronic devices.

REFERENCE BOOKS

1. Basic Electrical Engineering. : V.N. Mittle
2. Basic Electronics and Linear circuits : Kulshreshtha, Bhargara N.M. & S.C.Gupta TTTI Chandigarh
3. Electronic Devices and circuits : Milman and Halkias
4. Electronic Principles : Malvino
5. Electronic Devices and Circuit Theory : Robert Boylestad and Nashelsky
6. Electronic Devices and Circuits : Allen Mottershead
7. Electronic circuits : Floyd

SUBJECT TITLE : APPLIED SCIENCE LAB - PHYSICS
SUBJECT CODE : GE 106 A
PERIODS/WEEK : 2
PERIODS/YEAR : 64

LIST OF PRACTICAL EXPERIMENTS – PHYSICS

1. Vernier Calipers
2. Screw Gauge
3. Common balance
4. Simple Pendulum
5. Hooke's law
6. Moment bar
7. Inclined Plane
8. Concurrent forces (Mass of the body)
9. Hare's apparatus
10. U-tube
11. Quill tube
12. Resonance column
13. Diode Characteristics
14. Convex lens
15. Ohm's law

SUBJECT TITLE : APPLIED SCIENCE LAB – CHEMISTRY
SUBJECT CODE : GE 106 B
PERIODS/WEEK : 2
PERIODS/YEAR : 64

OBJECTIVES

I. VOLUMETRIC ANALYSIS

1.1 Acidimetry Alkalimetry

- 1.1.a Determine the strength of the given hydrochloric acid solution using a standard solution of sodium hydroxide and calculate the amount of HCl in a given volume
- 1.1.b Determine the strength of given sulphuric acid solution using a standard solution of sodium carbonate. Calculate the amount of sulphuric acid in a given volume
- 1.1.c Determine the strength of given sodium hydroxide solution given a standard solution of sodium carbonate using a standard solution sulphuric acid/hydrochloric acid. Calculate the amount of sodium hydroxide in a given volume
- 1.1.d Determine the strength of given nitric acid solution given a standard solution of oxalic acid using a standard solution sodium hydroxide/potassium hydroxide. Calculate the amount of nitric acid in a given volume.

1.2 Permanganometry

- 1.2.a Determine the strength of given potassium permanganate solution using a standard solution of ferrous ammonium sulphate
- 1.2.b Determine the strength and calculate the amount of crystalline ferrous solution

1.3 Hardness estimation

- 1.3.a Determine the degree of hardness of a given sample of hard water using a standard solution of EDTA.

II. pH DETERMINATION

- 2.1.1 Determine the pH of three different solutions using pH meter
- 2.1.2 Determine the pH value of three different solutions using universal indicator
- 2.1.3 Determine the pH value of three different solutions using pH test paper

III. PREPARATION OF STANDARD SOLUTIONS

- 3.1.1 Weigh accurately a crystalline substance using a chemical balance
- 3.1.2 Prepare a standard solution of sodium carbonate by weighing out accurately solid sodium carbonate and making it into a definite volume
- 3.1.3 Prepare a standard solution of oxalic acid when oxalic acid crystals are given.

CONTENT DETAILS

I. VOLUMETRIC ANALYSIS

- 1.1 Acidimetry Alkalimetry
 - a) Estimation of Hydrochloric acid
 - b) Estimation of Sulphuric acid
 - c) Estimation of Sodium hydroxide given standard sodium carbonate solution
 - d) Estimation of Nitric acid given standard sulphuric acid solution

- 1.2 Permanganometry
- 1.3 Estimation of potassium permanganate
- 1.4 Estimation of crystalline ferrous sulphate
- 1.5 Estimation of sodium hydroxide, given standard ferrous salt solution

- 1.3 Hardness estimation
 - Estimation of total hardness of water – using standard EDTA solution

II. pH DETERMINATION

- 2.1 Determination of pH using pH meter
- 2.2 Determination of pH using universal indicator, pH test paper.
- 2.3 Determination of pH using pH test paper.

III. PREPARATION OF STANDARD SOLUTION

- 3.1 Preparation of a standard solution of sodium carbonates
- 3.2 Preparation of a standard solution of oxalic acid

REFERENCE BOOKS

A.O. Thomas & Mani Practical Chemistry for B.Sc. main

SUBJECT TITLE : SOFTWARE LAB –I
SUBJECT CODE : CT 102/CHM 102
PERIODS/WEEK : 3
PERIODS/YEAR : 96

CONTENT DETAILS

1. Familiarization of Computer, Operating Systems – DOS
 - Booting
 - Disk Drive, file, directory structures
 - DOS Internal and external commandsFamiliarization of printer, its operation procedure
2. Write programs in C for simple mathematical problems
3. Write programs using relational & logical operations
4. Write programs using branching statements
5. Write programs using looping statements
6. Write programs using arrays, multidimensional arrays
 - Matrix manipulation
 - Sorting techniques
 - Searching techniques
7. Write programs with Structures & Union
8. Write programs using Functions
 - Simple functions
 - Recursion
 - Using library functions
9. Write programs on simple graphics

SUBJECT TITLE : BASIC ELECTRONICS LAB
SUBJECT CODE : CT 103/CHM 103
PERIODS/YEAR : 64

EXERCISES

1. Identification of Passive Components: Resistors, Capacitors, Inductors, Transformers, Thermistors, and LDR & familiarization with Breadboards.
2. Identification of various types of Electronic Instruments: Ammeters, Voltmeters, Multimeters (Analog and Digital), Function Generators, Power Supply and CRO.
3. To observe a Sine wave on a CRO and draw it indicating all its values: Amplitude, Time Period and Frequency.
4. Measurement of voltage at various setting (Low and high voltage) of regulated Power supply by using Analog & Digital Multimeters
5. Measurement of voltage and current by loading the regulated Power Supply.
6. Measurement of Resistors by Multimeters and Compare with Colour code value
7. Check an Electrolytic Capacitor using a Multimeter
8. Identification of Package type and Terminal familiarisation with characteristics & Rating using data book for various types of Diodes.
9. Checking of Diode using a Multimeter
10. Draw the VI characteristics (Forward and Reverse) of a silicon Diode. Determine the static and dynamic resistance
11. Draw the VI characteristics (Forward) of a Germanium Diode. Determine static and dynamic resistance.
12. Plot the VI characteristics of Zener diode. Determine the Breakdown voltage
13. Measure and Plot the Input/Output voltages of a half wave rectifier with and without filters. Calculate Ripple Factor
14. Measure and plot the Input/Output voltages of a full wave rectifier with and without filters. Calculate Ripple Factor.
15. Measure and Plot the Input/Output voltages of Bridge Rectifier with and without filters. Calculate Ripple Factor
16. Plot the wave shapers of a full wave rectifier with shunt capacitor, series inductor and π section filter. Measure voltages
17. Setup a voltage regulator using Zener Diode.
18. Construct a voltage Doubler and observe the output
19. Construct a voltage Tripler and observe the output
20. Identification of Package Type & Terminals familiarization with characteristic & Rating using data books for transistors
21. Plot the Input and Output characteristics for a transistor in common base configuration and determine current gain, Input and Output resistance
22. Plot the input and output characteristics for a transistor in common emitter configuration and determine current gain, input and output resistance.
23. Plot the VI characteristics of UJT
24. Plot the VI characteristics of a JFET
25. Familiarization of Ics and SMD

SUBJECTS OF STUDY AND SCHEME OF EVALUATION

BRANCH: COMPUTER ENGINEERING

Semester 3

Code	Subject	Periods Per Week			Evaluation (Marks)			
		Theory	Practical/Tutorial	Total	Theory	Practical	Internal	Total
CT301/ IF 301	Computer Mathematics	5	1	6	75		25	100
CT302/ CM 302 /IF 302	Digital Computer Principles	5	0	5	75		25	100
CT303/ IF303	Data Base Management System	5	1	6	75		25	100
CT304/ CM304/ IF304/ EP304	Objected Oriented Programming (C++ and Java)	5	1	6	75		25	100
CT305	Hardware Lab I (Digital Computer Principles)		3	3		75	25	100
CT306	Software Lab – II (C++ & Java)		3	3		75	25	100
CT307	Software Lab- III (Visual Basic)		3	3		75	25	100
	ISAP Skills Development		3	3				
	TOTAL	20	15	35		225	175	700

ISAP – Information Search Analysis and Presentation

SUBJECT TITLE : COMPUTER MATHEMATICS
SUBJECT CODE : CT 301 / IF 301
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Matrix & Liner Simultaneous Equation	18
II	Eigen values, Algebraic equations	18
	Test - I	2
III	Ordinary Differential Equations	18
IV	Set & Graph theory	18
	Test - II	2
V	Graph Operations	18
	Test - III	2
	Total	96

OBJECTIVES

UNIT I:

2.1.0 Understanding Matrix and Solutions of Linear Simultaneous equations

- 1.1.1 Illustrate the solution to find Rank of Matrix
- 1.1.2 Illustrate inverse of matrix
- 1.1.3 Illustrate crout's method
- 1.1.4 Illustrate Back Substitution method
- 1.1.5 Illustrate Gauss Elimination method
- 1.1.6 Illustrate Gauss-Jordan Elimination method
- 1.1.7 Illustrate Gauss Jacobi Iteration method
- 1.1.8 Illustrate Gause Seidel Iteration method
- 1.1.9 Illustrate relaxation method

UNIT II:

2.1.0 Understanding Eigen values and eigen vectors

- 2.1.1 Explain Eigen values and Eigen vectors
- 2.1.2 Illustrate Iterative methods for determining biggest eigen value
- 2.1.3 Illustrate Jacobi's Method

2.1.0 Understanding Algebraic and Transcendental Equations

- 2.1.1 Explain Error in numerical computation
- 2.1.2 Illustrate Iteration method
- 2.1.3 Illustrate Bisection method
- 2.1.4 Illustrate Regula-falsi method
- 2.1.5 Illustrate Newton Raphson method
- 2.1.6 Illustrate Horner's method

UNIT III:

3.1.0 Understanding Ordinary Differential Equations

- 3.1.1 Illustrate Taylor's series method
- 3.1.2 Illustrate Picard's method
- 3.1.3 Illustrate Euler's method
- 3.1.4 Illustrate Modified Euler's method
- 3.1.5 Illustrate Runge Kutta method

UNIT IV

4.1.0 Understanding SET & GRAPH THEORY

- 4.1.1 Explain sets
- 4.1.2 Discuss Venn diagram
- 4.1.3 Discuss Operation on sets
- 4.1.4 Explain Properties of set operation
- 4.1.5 Explain Basic laws of set algebra
- 4.1.6 Discuss Venn diagram of set operation
- 4.1.7 Define and explain Relations
- 4.1.8 Explain Properties of relation
- 4.1.9 Understand Operation on relation
- 4.1.10 Discuss Equivalences relations
- 4.1.11 Explain Representation of relations
- 4.1.12 Define and explain Functions
- 4.1.13 Discuss Types of functions
- 4.1.14 Discuss Inverse functions
- 4.1.15 Explain Composition of functions

UNIT V

5.1.0 Understanding graphs

- 5.1.1 Discuss Basic terminology
- 5.1.2 Understand Incidents and degree
- 5.1.3 Explain Paths, reachability and connectedness
- 5.1.4 Explain Vertex connectivity
- 5.1.5 Discuss Special graph
- 5.1.6 Explain Matrix representation of graph
- 5.1.7 Explain Undirected and Directed graph
- 5.1.8 Understand Incidents matrix
- 5.1.9 Explain Path matrix
- 5.1.10 Understand Incidence matrix of digraph

5.2.0 Understanding graph operation

- 5.2.1 Discuss deleting a vertex
- 5.2.2 Discuss deleting an edge
- 5.2.3 Discuss complement a graph
- 5.2.4 Discuss Union of two graph
- 5.2.5 Explain Inter section of graph
- 5.2.6 Explain Fusion
- 5.2.7 Explain Planarity
- 5.2.8 Explain Eulerian graph
- 5.2.9 Discuss Hamiltonian graph
- 5.2.10 Discuss Chromatic numbers

CONTENT OUTLINE

UNIT I

Matrix and Solutions of Linear Simultaneous equations

Rank of Matrix, inverse, crout's method, Back Substitution method, Gauss Elimination method, Gauss-Jordan Elimination method, Gauss Jacobi Iteration method, Gauss Seidel Iteration method, relaxation method

UNIT II :

Eigen values and eigen vectors

Eigen values -Eigen vectors - Iterative methods for determining biggest eigen value - Jacobi's Method
Algebraic and Transcendental Equations

Error in numerical computation- Iteration method - Bisection method - Regula-falsi method - Newton Raphson method - Horner's method

UNIT III :

Ordinary Differential Equations

Taylor's series method - Picard's method - Euler's method - Modified Euler's method - Runge Kutta method

UNIT IV

SET & GRAPH THEORY

Sets - Venn diagram - Operation on sets - Properties of set operation - Basic laws of set algebra Venn diagram of set operation – Relations - Properties of relation - Operation on relation - Equivalence relations - Representation of relations – Functions Types - Inverse functions - Composition of functions

UNIT V

Understanding Graph Operations

Understanding graph: Basic terminology - Incidents and degree - Paths, reachability and connectedness - Vertex connectivity - Special graph - Matrix representation - Undirected and Directed graph - Incidents matrix - Path matrix - Incidence matrix of digraph.

Graph operation - deleting a vertex - deleting an edge- complement a graph - Union of two graph – Intersection of graph – Fusion – Planarity - Eulerian graph - Hamiltonian graph - Chromatic numbers

REFERENCE BOOK

- | | | |
|--|---------------------|------------|
| 1. Numerical Method | S. Arumugam | (SCITECH) |
| 2. Discrete Structure and graph theory | G.S.s. Bhishma Rao | (SCITECH) |
| 3. Discrete mathematics | Swapan Kumar Sarkar | (S.Chand) |
| 4. Numerical methods | Sastri | |

SUBJECT NAME : DIGITAL COMPUTER PRINCIPLES
SUBJECT CODE : CT 302 /CHM 302 /INF 302
PERIODS/WEEK : 5
PERIODS/SEMESTER : 80

<u>UNIT</u>	<u>TOPIC</u>	<u>TIME SCHEDULE</u>	<u>PERIODS</u>
I	Number System and Boolean Algebra		15
II	Combinational Circuits		15
		Test – 1	2
III	Sequential Circuits		15
IV	DAC and ADC		15
		Test - 2	2
V	Memory Design		14
		Test - 3	2
		Total	80

OBJECTIVES

UNIT – I

1.1.0 Understand the various number systems

- 1.1.1 Explain binary, octal, decimal and Hexadecimal number systems
- 1.1.2 Convert decimal nos. to binary, octal and Hexadecimal and vice versa
- 1.1.3 Convert binary to octal, binary to Hexadecimal, octal to binary, octal to Hexadecimal, hexadecimal to binary, Hexadecimal to octal
- 1.1.4 Perform binary addition, subtraction, multiplication and division
- 1.1.5 Perform octal and hexadecimal arithmetic
- 1.1.6 Write 1's complement and 2's complement for a binary number
- 1.1.7 Perform binary subtraction using 1's and 2's complement

1.2.0 Understand binary codes.

- 1.2.1 Discuss the BCD, gray, ASCII, EBCDIC, Excess 3,2421,84-2-1,biquinary,card code
- 1.2.2 State the concept of parity bit for error detection.
- 1.2.3 Explain the odd and even parity methods.
- 1.2.4 Explain Hamming code method of single bit error correction
- 1.2.5 Define Boolean function.
- 1.2.6 State the postulates of Boolean algebra.
- 1.2.7 State the basic theorems in Boolean algebra.
- 1.2.8 State and prove De-Morgan's Law.
- 1.2.9 State the need of truth tables.
- 1.2.10 Draw the truth tables for functions.
- 1.2.11 Explain the sum of product and product of sum forms.
- 1.2.12 Simplify equations using K maps up to 4 variables.
- 1.2.13 State the don't care condition.
- 1.2.14 Develop simplified logic circuits for a given problem.

UNIT – II

2.1.0 Understand combination circuits and logic families

- 2.1.1 Define combination circuits
- 2.1.2 Explain basic gates AND, OR, NOT with truth tables
- 2.1.3 Realize functions using basic gates
- 2.1.4 Explain NAND, NOR, and XOR gates with truth tables
- 2.1.5 Develop AND, OR gates using NAND NOR gates
- 2.1.6 Realize the functions using NAND, NOR and XOR gates
- 2.1.7 Design BCD to excess-3 code converter.
- 2.1.8 Design BCD to seven-segment code converter.
- 2.1.9 Design half adder and full adder (AND-OR, NAND-NAND)
- 2.1.10 Design half Subtractor and full Subtractor (AND-OR, NAND-NAND)
- 2.1.11 Explain 3 bit and 4 bit magnitude comparator
- 2.1.12 Define decoder and encoder.
- 2.1.13 Design 3-8 line decoder using AND gates.
- 2.1.14 Design 8-3 line encoder using OR gates.
- 2.1.15 Define multiplexer / Demultiplexer
- 2.1.16 Draw the block diagram of a multiplexer
- 2.1.17 Construct logic circuit for 8-to-1 line MUX
- 2.1.18 List the applications of multiplexer
- 2.1.19 Draw block diagram of Demultiplexer
- 2.1.20 Construct logic circuit of 1-to-8 line de-multiplexer
- 2.1.21 Implement combinational circuit for 8 input logic function using MUX.

UNIT – III

3.1.0 Understand sequential circuits

- 3.1.1 Define sequential circuits
- 3.1.2 State the use of clock in sequential circuits.
- 3.1.3 Distinguish between combinational and sequential circuits
- 3.1.4 State the basic principle of flip flops
- 3.1.5 Illustrate how flip flop acts as a memory device (using NAND & NOR gates)
- 3.1.6 Draw the block diagram and truth table of RS and D latches
- 3.1.7 Draw the block diagram and truth table of JK and T Flip Flop.
- 3.1.8 Define edge triggering
- 3.1.9 Discuss about preset and clear inputs
- 3.1.10 Discuss the Race around condition
- 3.1.11 State the need of master-slave flip flops
- 3.1.12 Describe briefly the working of master-slave JK flip flops
- 3.1.13 List the different types of registers
- 3.1.14 Draw the block diagram of Serial in serial out shift register and explain
- 3.1.15 Draw the block diagram of serial in parallel out shift register and explain

3.2.0 Understand binary counters

- 3.2.1 List the different types of counters
- 3.2.2 Differentiate between synchronous and asynchronous counters
- 3.2.3 Draw the circuit diagram of an asynchronous ripple counter and explain with the wave forms and state table
- 3.2.4 Define modulo- n counter
- 3.2.5 Design modulo – n counters using T Flip flop and JK flip flops
- 3.2.6 Design up-down counters.

UNIT – IV

4.1.0 Understand D to A and A to D converters and more logic circuits

- 4.1.1 Define accuracy
- 4.1.2 Define resolution
- 4.1.3 Calculate accuracy and resolution for DAC
- 4.1.4 Draw the block diagram of simple binary weighted DAC

- 4.1.5 Explain simple binary weighted DAC
- 4.1.6 Explain briefly R- 2R ladder type network for DAC
- 4.2.0 Define ADC**
- 4.2.1 Define & calculate resolution for ADC
- 4.2.2 Theory and block diagram of counter-ramp type ADC
- 4.2.3 List the advantages and disadvantage of counter ramp type ADC
- 4.2.4 Draw the block diagram of successive approximation ADC
- 4.2.5 Explain briefly successive approximation ADC
- 4.2.6 List the advantages and disadvantages of SA- ADC

UNIT V

5.1.0 Understand Memory Design

- 5.1.1 Define RAM and ROM
- 5.1.2 Draw the block diagram of RAM
- 5.1.3 State the steps to read and write operations in RAM
- 5.1.4 Explain static RAM with a neat circuit diagram
- 5.1.5 Draw logic diagram and symbol of static RAM bit slice model.
- 5.1.6 State the advantages of DRAM
- 5.1.7 Draw logic diagram and symbol of DRAM bit slice model.

5.2.0 Draw the block diagram of ROM

- 5.2.1 Explain ROM design using diodes
- 5.2.2 Explain internal logic of 32 x 8 ROM
- 5.2.3 Using a circuit diagram explain ROM programming using decoder
- 5.2.4 Design Combinational circuit implementation using ROM
- 5.2.5 Define Programmable Logic Array
- 5.2.6 Design PLA with 3 input and 2 output

CONTENT OUTLINE

UNIT – I

Number systems – Binary, Octal, Decimal, Hexadecimal – Base conversion – Binary arithmetic – addition, subtraction, multiplication, division – Binary subtraction using 1's and 2's complement. Binary codes – BCD, Gray, ASCII, EBCDIC, Excess-3, – Parity bits. Boolean algebra–Product of sum form - Sum of product form - simplifications of Boolean functions – K-map.

UNIT – II

Logic gates – AND, OR, NOT, NAND, NOR, XOR gates – Realization of Boolean functions using gates and universal gates. Combinational circuit design – BCD to excess-3 code converter – BCD to seven segment code converter – Binary adders – Half adder, Full adder – Design of Decoder and Encoder – Design of Multiplexer and Demultiplexer – Combinational logic implementation using MUX.

UNIT – III

Sequential circuit design – Clocked sequential circuit – RS and D latches – Flip Flops – JK, T and Master Slave JK – Shift registers – serial in serial out – serial in parallel out. Binary counters – Asynchronous (ripple) counter – Synchronous binary counter – Up-down binary counter – Mod-N counter.

UNIT – IV

Digital to analog conversion – Binary weighted DAC – R-2R ladder type network for DAC – Analog to digital conversion – Ramp type ADC – Successive Approximation

UNIT – V

Memory Design – Static RAM cell design – Internal structure of SRAM – Dynamic RAM design – Internal Structure of DRAM – ROM design – Diode ROM – ROM design using Decoder – Combinational circuit using ROM – Programmable Logic Array - Design

REFERENCE BOOKS

Logic and Computer Design Fundamentals (2 Ed.)	– M.M. Mano (Pearson Education)
Digital computer fundamentals	– Thomas S Bartee
Fundamentals of digital circuits	– A. Anand Kumar
Digital Electronics	- Thomas L Floyd

SUBJECT TITLE : DATABASE MANAGEMENT SYSTEMS
SUBJECT CODE : CT 303/ IF 303
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Introduction to database	18
II	Relational Model	18
	Test – 1	2
III	Features of SQL	18
	Test – 2	2
IV	Advanced SQL	18
V	File and Storage management	18
	Test - 3	2
	Total	96

OBJECTIVES

UNIT – 1

1.1.0 Understand Database

- 1.1.1 Define Field, Record , Database
- 1.1.1 Distinguish between Physical record –and Logical Record
- 1.1.2 Explain Advantages of DBMS
- 1.1.3 Understand Schema, Subschema, - Instances, Three schema architecture
- 1.1.4 Define data independence.
- 1.1.5 Distinguish b/w Logical data independence and Physical data .independence

1.2.0 Explain Database system structure(Architecture)

- 1.2.1 Explain Storage manager, Query processor, Disk storage, Database Users
- 1.2.2 Discuss Database Languages – DDL , DML,DCL
- 1.2.3 Understand various Database system application architectures like Centralized DBMS architecture, Basic client/server architecture, Two tier client/server architectures, and three tier client/server architectures

1.3.0 Data models

- 1.3.1 Understand ER model
- 1.3.2 Define Entity, Attribute, Keys, Relationship types, Relationship set
- 1.3.3 Define Primary key, Candidate key, Super key
- 1.3.4 Explain ER diagram, Weak entity set
- 1.3.5 Compare ER Model and Enhanced ER Model
- 1.3.6 Understand EER Model: Subclasses – Super classes – Inheritance – Specialisation – Generalisation
- 1.3.7 Unified Modelling Language– Class diagram

UNIT – 2

2.1.0 Understand Relational model Concepts

- 2.1.1 Define Domains, Attributes, Tuples
- 2.1.2 Study Mapping ER model to Relational model
- 2.1.3 Explain Constraints: Domain constraints, Key constraints, Entity integrity, Referential integrity, Foreign keys

2.2.0 Understand Relational algebra operations

2.2.1 Explain the following operations with examples: Select, Project, Rename, Union, Intersection, Difference, Cartesian Product, Division, Join, Equijoin, Natural join

2.3.0 Understand Relational database design

2.3.1 Explain design guidelines for relation schema

2.3.2 Explain Functional dependency

2.3.3 Define Normalization

2.3.4 Explain normal forms: 1NF – 2NF – 3NF – Boyce Codd Normal Form

2.3.5 Explain Decomposition, Dependency preservation, Multi-valued dependencies

2.3.6 Explain 4NF with example

2.3.7 Understand Join dependencies and define 5NF

UNIT - 3

3.1.0 Understand SQL

3.1.1 Explain features of SQL

3.1.2 Explain Data types in SQL

3.1.3 Understand Domains, attributes, and tuples

3.1.4 Explain CREATE TABLE command

3.1.6 Explain Constraints: NULL, DEFAULT, CHECK, PRIMARY KEY, UNIQUE, referential Integrity

3.1.7 Understand DROP TABLE Command, ALTER TABLE

3.1.8 Understand commands for creating and roping indexes CREATE INDEX, CREATE UNIQUE INDEX, DROP INDEX

3.1.9 Explain SELECT statements with WHERE, ORDER BY clause with examples

3.1.10 Explain UPDATE Statement, INSERT, DELETE with example

3.1.11 Explain Nested queries, tuples and multi set comparison, Correlated nested queries

3.1.12 Explain EXISTS and UNIQUE functions

3.1.13 Explain explicit sets and renaming of attributes

3.1.14 Explain Joining tables – aggregate functions

3.1.15 Explain grouping: GROUP BY, HAVING clauses

3.1.16 Explain BEGIN TRANS, COMMIT, ROLL BACK, SAVE POINT

3.1.17 Explain Views: Advantages, Creation and Updation

3.1.18 Explain Query optimization

UNIT - 4

4.1.0 Understand advanced SQL

4.1.1 Study triggers and cursors

4.1.2 Study reports and forms

4.1.3 Explain stored procedures and functions

4.1.4 Discuss how Procedures are invoked from Inteface

4.2.0 Understand Embedded SQL

4.2.1 Understand about Embedded SQL statements and its application

4.2.2 Explain retrieving single tuples with embedded SQL

4.2.3 Explain retrieving multiple tuples with embedded SQL using cursor

4.2.4 Explain dynamic SQL by specifying queries at run time

UNIT – 5

5.1.0 Understand file management and Data storage

5.1.1 Explain placing File Records on Disk: Records, record types, Fixed length record, variable length record

5.1.2 Explain Heap files, Sorted files, Hashing, files of mixed records

5.1.3 Explain RAID technology, Storage area networks

5.2.0 Explain distributed database and its architecture

5.2.1 Explain advantages of distributed database over centralised database

- 5.1.2 Explain data storage in distributed database: Data fragmentation and Data replication
- 5.3.0 Understand various Indexing structures: Primary indices, Clustering Indices, Secondary Indices, Index on multiple fields**
- 5.4.0 Transaction management**
 - 5.2.1 Define Transaction
 - 5.2.2 Explain transaction concepts
 - 5.2.3 Understand Properties of transactions, , Transaction Sates
 - 5.2.4 Explain Concurrent Executions
 - 5.2.5 Explain Serializability

CONTENT DETAILS

UNIT – I

Understand Database – Field – Record – Table – Database - Physical record – Logical Record – DBMS – Advantages Schema – Subschema ,Data independence – Instances
 Database system structure – Users –Languages-Database system application architecture
 Data models – ER model – Entity – Attribute – Keys – Relationship types – Sets – Keys
 ER diagram – Weak entity set — Enhanced ER – UML – Class diagram

UNIT – II

Relational model – Concepts – Constraints – Key constraints – Referential integrity – Foreign keys
 Relational algebra operations –Unary & Binary relational operations
 Relational database design –Guidelines- Functional dependency – Normalization – 1NF – 2NF – 3NF – Boyce Codd Normal Form – Decomposition – Dependency preservation – Multivalued dependencies – 4NF – Join dependencies – 5NF

UNIT - III

SQL – Features of SQL – Data types in SQL , Domains in SQL, CREATE TABLE command, Constraints – NULL, DEFAULT,CHECK, PRIMARY KEY, UNIQUE, , referential Integrity – DROP TABLE Command , ALTER TABLE , CREATE INDEX, CREATE UNIQUE INDEX, DROP INDEX
 SELECT statements with WHERE, ORDER BY, UPDATE Statement, INSERT, DELETE, nested queries, tuples and multi set comparison , Correlated nested queries – EXISTS and UNIQUE functions in SQL IN Clause, Explicit sets and renaming of attributes in SQL, Joining tables – aggregate functions, Grouping - GROUP BY, HAVING clauses – Views
 Query optimization – transaction concepts – properties of transactions

UNIT - IV

Triggers, cursors – stored procedures and functions , embedded SQL, Retrieving single tuples with embedded SQL
 Dynamic SQL – specifying queries at run time using dynamic SQL

UNIT – V

Storage of Databases – Placing File Records on Disk: Heap files – Sorted files – HashingRAID technology – Storage area networks

Indexing structures Primary indices, Clustering Indices, Secondary Indices, Index on multiple fields

Transaction management-Transaction concepts -Properties of transactions-Sates-Concurrent Executions-Serializability

Distributed database – Architecture – Advantages – Data storage – Data fragmentation – Data replication

REFERENCE BOOKS

1. Fundamentals of database systems – Elmasri, Navathe, Somarajulu, and Gupta.
(Pearson)
2. Database system concepts - Silberschatz, Korth, and Sudarshan (TMH)
3. Oracle 7 the complete reference - Ivan Bay Ross
4. SQL for professional - Swapne & Rajesh Naik

**SUBJECT TITLE : OBJECT ORIENTED PROGRAMMING
(C++ and Java)**
SUBJECT CODE : CT 304/ CM304 /IF 304 / EP 304
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Introduction to Object Oriented Programming	20
II	Overloading & Inheritance in C++	18
	Test – 1	2
III	Pointers & Files in C++	16
IV	JAVA Fundamentals	18
	Test - 2	2
V	Interactive programming in Java	18
	Test - 3	2
	Total	96

OBJECTIVES

UNIT – 1

1.1.0 Understand the object oriented programming

- 1.1.1 Explain object oriented approach
- 1.1.2 Explain the organization of data and functions on OOP
- 1.1.3 Study objects, classes, data abstraction and encapsulation inheritance, Polymorphism, dynamic binding
- 1.1.4 Explain the benefits of OOP
- 1.1.5 List the applications of OOP

1.2.0 Understand the c + + programming basics

- 1.2.1 List keywords of C + + other than C
- 1.2.2 Explain access specifiers private and public
- 1.2.3 Study the dynamic initialization of variables
- 1.2.4 Study the reference variables
- 1.2.5 List the operators in C++
- 1.2.6 Study constructors and destructors
- 1.2.7 Study parameterized, dynamic, and overloaded constructors.
- 1.2.8 Explain the declarations and advantages of inline functions
- 1.2.9 Study passing objects to functions
- 1.2.10 Study Returning objects from functions
- 1.2.11 Explain the declarations and accessing of array of objects
- 1.2.12 Explain friend functions and its necessity

UNIT – 2

2.1.0 Understand overloading

- 2.1.1 Study the concept of overloading
- 2.1.2 Study function overloading and operator overloading
- 2.1.3 Study how to overload unary operators and binary operators

2.2.0 Understand Inheritance

- 2.2.1 State the necessity for inheritance
- 2.2.2 Explain the relation between base class and derived class
- 2.2.3 Give the syntax for defining a derived class
- 2.2.4 Explain protected access specifier
- 2.2.5 Compare public, protected, and private inheritance
- 2.2.6 Study multilevel inheritance, multiple inheritance & hybrid inheritance
- 2.2.7 Explain classes within class

UNIT – 3

3.1.0 Know Pointers

- 3.1.1 Understand pointers
- 3.1.2 Study about memory management
- 3.1.3 Discuss of new and delete
- 3.1.4 Study about “this” pointer

3.2.0 Understand Files

- 3.2.1 Define stream
- 3.2.2 Study about file stream
- 3.2.3 Study the modes for opening file
- 3.2.4 Explain some file functions like write(), read(), get(), put(), tell(), seekp(), tellg(), seek().

UNIT - 4

4.1.0 Overview of Java

- 4.1.1 Explain the evolution of Java
- 4.1.2 Discuss Java in connection with Internet and C#
- 4.1.3 Explain need for Security and Portability
- 4.1.4 Explain Bytecode, JVM & Java Runtime environment

4.2.0 Understand Features of Java

- 4.2.1 Discuss Simplicity, Robustness, Multithreading and Platform independency
- 4.2.2 Discuss Java keywords, data types and importance of Unicode
- 4.2.3 Discuss various Control statements, Arrays, and Operators
- 4.2.4 Illustrate Classes and Methods
- 4.2.5 Explain Class Fundamentals and Command line arguments
- 4.2.6 Explain in detail: “public static void main (String args[])”
- 4.2.7 Discuss Nested classes and inner classes
- 4.2.8 Explain Inheritance and types of inheritance, abstract classes
- 4.2.9 Discuss packages, interfaces

UNIT – 5

5.1.0 Understand Exception Handling and Multithreading

- 5.1.1 Discuss exception Handling and Multithreading
- 5.1.2 Discuss fundamentals of Java Network programming

5.2.0 Understand Java Input Output

- 5.2.1 Study the uniqueness of Java I/O
- 5.2.2 Explain streams
- 5.2.3 Distinguish Byte stream and character stream
- 5.2.4 Explain the general I/O classes

5.3.0 Know Internet Programming in Java

- 5.3.1 Define Applet
- 5.3.2 Explain Applet Architecture and life cycle of an applet
- 5.3.3 Differentiate Applets and Midlets
- 5.3.4 Define Servlets
- 5.3.5 Compare application programs, applets and servlets

CONTENT OUTLINE

UNIT - 1

Characteristics of object – class – inheritance – polymorphism – overloading encapsulation – dynamic binding – access specifiers – dynamic initialization of variables – operators – reference variables

Constructors and destructors – memory allocation of objects and classes – inline functions – objects as arguments – returning objects – Array of objects - friend functions

UNIT - 2

Function overloading – overload unary and binary operators –Inheritance – base class – derived class – protected access specifiers – class hierarchies – types of inheritances – classes within class.

UNIT 3

Pointers to objects – dynamic memory management - this pointer – Stream – file streams – modes of opening file – file functions

UNIT 4

Overview of Java, Java Features, programming features, Classes and Methods

UNIT 5:

Advanced Programming features, Exception Handling and Multithreading ,Java Input Output classes, Internet programming, Applets, Servlets

Reference Books:

1. “Object oriented programming in C + +” - Balaguruswami
2. “Java2: The Complete reference” - Herbert Schildt (Tata-McGrawhill)
3. “C++: The Complete Reference” - Herbert Schildt (Tata-McGrawhill)
4. Mastering C++ - Venugopal (Tata-McGrawhill)
5. Projects using C++ - Varalakshmi (Scitech Publishers)
6. Programming with Java 2 - Xavier (Scitech Publishers)

SUBJECT TITLE : HARDWARE LAB - I
(DIGITAL COMPUTER PRINCIPLES)
SUBJECT CODE : CT305
PERIODS PER WEEK : 3
PERIODS PER SEMESTER : 48

(Exercise minimum 15 experiments from the following)

1. Design basic gates using transistors and resistors
2. Familiarise logic gate ICs – AND, OR, NOT, NAND, NOR, XOR
3. Realisation of Boolean functions using NAND and NOR gates
4. Design Binary to gray code converter
5. Design Grey to Binary code converter
6. Design BCD to excess-3 code converter
7. Design BCD to seven segment code converter
8. Construct Odd/even parity generators and verify truth table using XOR gates
9. Construct Half adder and Full adder using XOR and AND gates
10. Construct and study 4 to 1 MUX using gates
11. Construct 1 to 4 DEMUX using gates
12. Verify the truth tables of positive edge triggered and negative edge triggered IC Flip Flops (D and JK) and MS-JK Flip Flop
13. Construct 3-bit serial in serial out shift register
14. Construct 3-bit parallel in serial out shift register
15. Construct Ripple counter using JK flip flop
16. Construct Decade counter using JK flip flop
17. Verify the truth table for encoder, decoder, multiplexer and de-multiplexer using ICs.
18. Construct DAC using R-2R ladder network and observe the output waveform

SUBJECT TITLE : SOFTWARE LAB – II (C++ & JAVA)
SUBJECT CODE : CT 306
PERIODS/WEEK : 3
PERIODS/SEMESTER : 48

LIST OF EXERCISES

1. Simple programs using Class
2. Programs using more than one object with constructors and destructors
3. Programs using array of objects
4. Programs to pass and return objects as arguments
5. Programs using friend functions
6. Programs for overloading unary and binary operators
7. Programs for constructor overloading
8. Programs for file operations
9. Simple programs using Java
10. Implement command line programs using java
11. Implement inheritance using java
12. Implement I/O operations using I/O classes
13. Implement simple applet programs
14. Implement client server programs using applets and servlets

SUBJECT TITLE : SOFTWARE LAB III (Visual Basic)
SUBJECT CODE : CT 307
PERIODS/WEEK : 3
PERIODS/SEMESTER: 48

LIST OF EXERCISES

- 1 Experiments using textbox, label, command button, graphic control
- 2 Experiments using combobox, checkbox, radio buttons, option button controls
- 3 Experiments for MDI forms and create menu to call child forms
- 4 Experiments using control structures like if statements, loops and arrays
- 5 Experiments using functions and procedures
- 6 Experiments with common dialog controls
- 7 Experiments for file organization: sequential and random
- 8 Experiments using file controls: file list, dir list, drive list controls
- 9 Experiments for Activex controls
- 10 Experiments for creating database applications with ADO controls
 - a) Inserting data
 - b) Finding data
 - c) Displaying data using flexgrid control
 - d) Updating data

Information Search Analysis and Presentation Skills Development

Periods /Week : 3
Periods /Semester : 48

Introduction

The average Engineer walking out of education institution is surprised by the amount of non-technical work he or she faces in the real world (by the amount of personal contact, the number of phone calls, meetings, reports and presentation etc). Further many cannot find appropriate jobs, because of the lack of these skills. The problem aggravates in the case of diploma pass outs who are supposed to have interactions with different cadres in an industrial environment.

The time allotted for ISAP skills development are to be utilized to provide a slice of practical training in a form that may be used in a class room setting. This is not to be taught in a conventional manner. Here the emphasis will shift from teacher oriented methods to students oriented methods. While the information – skills acquired by all students will be same, the actual methods & techniques used by each student will vary according to his or her initiative, enthusiasm, effort taken etc.

These hours are to be taken as a supplement to the theory classes. Students will acquire ISAP skills based on the fundamental knowledge he/she has acquired from the theory sessions.

Objectives

Educational researchers have found that 17 year olds, in a single academic year, learn about 200 to 300 new words, in a university environment. However, during the same period they acquire around 4000 words in their informal home and play environment. That is learning is higher in an informal environment than in an academic one designed specifically for that purpose. The primary objective here is to simulate the informal learning environment.

Student is provided an ideal opportunity to acquire skills in learning to learn which is essential for the professional growth. This will inculcate information skills in the students. These skills will be a life long asset to him or her in fact they grow with age.

Oral and written communication skills are of at most importance to any engineer for a positive professional growth. Emphasis is given for this aspect also.

Activities

A. PART ONE.

Write articles on various technical areas and basic research papers. Students can identify simple projects individually or groups of not more than 4 any technical area. Emphasis here is on the acquisition of ISAP skills.

Source of Information

- a. People
- b. Print media – Magazines, News papers, Journals, Vendors catalogues etc.
- c. Electronic information – CD ROM, Usage of internet – User news groups, WWW.

B. PART TWO

Transparency based Presentation

1. Preparation
 - 1.1 Audience Analysis.
 - 1.2 Information Gathering.
 - 1.3 Transparency design using Power Point/Presentation software.
 - 1.4 Production of transparency for OHP.

2. Delivery

Sample Projects

1. Prepare and deliver transparency based presentations on the topics,
 - a. Technicians are not properly appreciated in the society.
 - b. Engineers do not know about non technical topics.
 - c. Lay people do not know enough about technical topics.
 - d. India's products are not competitive in international markets as its quality is not good.
 - e. India's software professionals are paid too much.
2. Prepare transparency based presentation for the opposite side of the issue you choose in project 1.
3. Prepare and deliver a brief autobiographical presentation.
4. Prepare and deliver a sales promotional presentation (Example – Washing machine, Computer , Air conditioner, Microwave oven or other items related to your branch of study)
5. Prepare and deliver a brief sales promotional presentation on a service (Example- Insurance Policy, Credit cards etc)
6. Prepare and deliver a technical presentation before lay audience (Example – Use of computers to common man, energy saving measures in a domestic environment or other topics related to specific branches of study)

C. PART THREE – COMMUNICATION SKILLS

Written Communication

Preparation of

- a. Reports
 - Formal reports
 - Progress reports
 - Feasibility Reports
 - Laboratory reports.
- b. Technical Proposals.
- c. Email.
- d. User manuals
- e. Job Hunting material
 - Resumes
 - Letters for job hunting
- f. Business letters
- g. Memo, Notices, Agenda and minutes

Oral Communication

Oral communication activities like,

- a. Dyadic communication (Interaction between two persons, example Telephone conversation)
- b. Meetings.
- c. Job interview.
- d. Group Discussions.
- e. Debates.
- f. Case studies.

EVALUATION

There is no separate evaluation for ISAP skills. But the teachers will consider this for the award of internal assessment marks related to the theory subjects in that semester. The performance of the student will be taken equivalent to an Assignment and an Examination while awarding the internal assessment marks.

SUBJECT OF STUDY AND SCHEME OF EVALUATION

BRANCH: COMPUTER ENGINEERING

Semester 4

Code	Subject	Periods Per Week			Evaluation (Marks)			
		Theory	Practical/Tutorial	Total	Theory	Practical	Internal	Total
CT401/ IF401	Data Structures	5	1	6	75		25	100
CT402/ CM402/ IF402	Operating Systems	5	1	6	75		25	100
CT403/ CM403	Microprocessors & Micro Controllers	5	1	6	75		25	100
CT404	Computer Communication & Networks	5	0	5	75		25	100
CT405	Hardware lab – II (Micro Controller Lab – I)		3	3		75	25	100
CT406	Software Lab- IV (RDBMS)		3	3		75	25	100
CT407	Software Lab- V (Application Development)		3	3		75	25	100
	ISAP Skills Development		3	3				
	TOTAL	20	15			225	175	700

SUBJECT TITLE : DATA STRUCTURES
SUBJECT CODE : CT 401/IF 401
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Pointer, Recursion and structure	18
II	sorting and searching	18
	Test – 1	2
III	Linked List	18
IV	Stack and Queue	18
	Test - 2	2
V	Tree and Graph	18
	Test - 3	2
	Total	96

OBJECTIVES

UNIT – I

1.1.0 Understand Pointers

- 1.1.1 Discuss features of pointers
- 1.1.2 Explain pointer declaration
- 1.1.3 Discuss pointers arithmetic
- 1.1.4 State the method of accessing variables using pointers
- 1.1.5 Implement One dim & two dim arrays using pointers
- 1.1.6 Explain array of pointers
- 1.1.7 Explain pointer to pointer
- 1.1.8 Discuss use of pointer to handle string
- 1.1.9 Discuss void pointer
- 1.1.10 Explain use of pointers as function arguments

1.2.1 Define recursion

- 1.2.2 Discuss direct and indirect recursion
- 1.2.3 Implement recursion

1.3.1 Discuss features of structure

- 1.3.2 Explain declaration & initialization of structures
- 1.3.3 Explain structure within structure
- 1.3.4 Explain array of structures
- 1.3.5 Explain use of pointers to structures
- 1.3.6 Explain passing structure to functions
- 1.3.7 Define union
- 1.3.8 Differentiate structure and union

1.4.1 Implement string operations such as string length, compare, copy, sub-string using User defined functions.

- 1.4.2 Explain and implement pattern matching
- 1.4.3 Explain dynamic memory allocation

UNIT II

- 2.1.1 List different sorting techniques
- 2.1.2 Implement bubble sort
- 2.1.3 Implement selection sort
- 2.1.4 Implement insertion sort
- 2.1.5 Implement quick sort
- 2.1.6 Implement bucket sort
- 2.1.7 Implement Heap sort
- 2.1.8 Define merging
- 2.1.9 Understand external sort
- 2.1.10 Implement merge sort
- 2.1.11 Define searching
- 2.1.12 Implement linear search
- 2.1.13 Implement binary search
- 2.1.14 Compare the different sorting algorithms such as bubble sort, quick sort, selection sort, heap sort insertion sort merge sort
- 2.1.15 Compare different searching algorithms such as linear searching and binary searching

UNIT III

- 3.2.1 Define linked list
- 3.2.2 Study operations on linked list – traversal, searching, insertion and deletion of nodes.
- 3.2.3 Explain singly linked list (SLL)
- 3.2.4 Implement SLL
- 3.2.5 Explain circular linked list
- 3.2.6 Implement circular linked list
- 3.2.7 Explain doubly linked list (DLL)
- 3.2.8 Implement DLL
- 3.2.9 Explain circular DLL
- 3.2.10 Implement circular DLL

UNIT – IV

- 4.1.1 Define stack
- 4.1.2 Describe the push and pop operation of a stack
- 4.1.3 Implement stack using arrays
- 4.1.4 Implement stack using pointers
- 4.1.5 Explain applications of stack
- 4.1.6 Define queue
- 4.1.7 Explain the operations on queue – insert and delete
- 4.1.8 Implement queue using arrays
- 4.1.9 Implement queue using pointers
- 4.1.10 Implement circular implementation of a queue
- 4.1.11 Explain double ended queue – input restricted Dqueue & output restricted Dqueue
- 4.1.12 Explain priority queue – ascending and descending
- 4.1.13 Understand applications of queue

UNIT – V

- 5.1.1 Define tree
- 5.1.2 Understand terms – root, node, child, parent, link, leaf, level, height, degree of a node, sibling, terminal node, path length, forest, labeled trees
- 5.1.3 Explain binary tree
- 5.1.4 Discuss the different operation on tree
- 5.1.5 State the applications of trees
- 5.1.6 Implement binary tree operations – insertion, deletion of node and searching
- 5.1.7 Discuss tree traversal methods
- 5.1.8 Implement tree traversal algorithms – inorder, preorder, postorder

- 5.1.9 Discuss Binary Search Tree (BST)
- 5.1.10 Discuss the use of threaded binary tree
- 5.2.1 Define graph
- 5.2.2 Explain searching methods – DFS, BFS
- 5.2.3 Explain Dijkstra algorithm to find shortest path
- 5.2.4 Implement Dijkstra algorithm

CONTENT OUTLINE

UNIT – I: POINTERS AND STRUCTURES

Pointer – Implementations – pointer arithmetic – pointers as function arguments – recursion.
 Structure – Implementation – pointer to structure – array of structures – structure as function arguments – union.
 String operations – pattern matching – Dynamic memory allocation – User defined functions for string manipulations.

UNIT – II: SORTING AND SEARCHING

Array operations - sorting techniques – Bubble sort, Selection sort, Insertion sort, Quick sorts, Bucket sort, Heap sort - Merge sort – Searching techniques – Linear search – Binary search – Comparison

UNIT – III: LINKED LIST

Linked list – Singly, Doubly, Circular, Circular doubly – Operations – traversal, searching – insertion, deletion of nodes.

UNIT – IV : STACK & QUEUE

Stack – operations – Implementation using arrays – Implementation using pointers – applications.
 Queue – operations – Implementation using arrays – pointers – circular queue – Double ended queue – Priority queue

UNIT – V : TREE and GRAPH

Trees – Binary tree – Tree traversal – In order, preorder, post order – Searching – Insertion, deletion of nodes – Binary Search Tree
 Graph – Implementation of BFS, DFS – Dijkstra algorithm

REFERENCE BOOKS

- | | |
|---|---------------------------------|
| 1. Introduction to Data structures in C | - Ashok N Kamthane (Pearson Ed) |
| 2. Data structures using C & C++ | - Tanenbaum, PHI |
| 3. Pointers in C | - KANETKAR, BPB |
| 4. Data structure using C | - Bandyopadyay, Kashi Nath Dey |

SUBJECT TITLE : OPERATING SYSTEMS
SUBJECT CODE : CT 402 /IF 402 /CM 402
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

<u>UNIT</u>	<u>TOPIC</u>	<u>TIME SCHEDULE</u>	<u>PERIODS</u>
I	Introduction to OS		16
II	Process management		18
		Test – 1	2
III	Memory Management		18
IV	Device and Information management		18
		Test – 2	2
V	Introduction to Linux & Shell programming in Linux		20
		Test - 3	2
		Total	96

OBJECTIVES

UNIT – 1

1.1.0 Introduction to operating systems

- 1.1.1 Explain the evolution of OS (Early systems)
- 1.1.2 Define OS
- 1.1.3 Describe the abstract view of components of a computer
- 1.1.4 Discuss user view, system view and system goals
- 1.1.5 Discuss storage hierarchy with diagram

1.2.0 Types of Operating System

- 1.2.1 Explain batch systems
- 1.2.2 Distinguish between multi-programming and time-sharing systems
- 1.2.3 Define multi-processor systems
- 1.2.4 Explain the advantages of multi-processor systems
- 1.2.5 Distinguish symmetric multi-processing and asymmetric multi- processing
- 1.2.6 Discuss client-server systems, peer-to-peer systems
- 1.2.7 Discuss asymmetric clustering and symmetric clustering
- 1.2.8 Differentiate soft real time systems and hard real time systems
- 1.2.9 Define various handheld systems
- 1.2.10 Discuss DOS, Unix, Windows, and Linux

1.3.0 Understand Operating System components

- 1.3.1 Discuss process management
- 1.3.2 Discuss main-memory management
- 1.3.3 Discuss file management
- 1.3.4 Discuss secondary-storage management
- 1.3.5 Discuss Networking, protection system and command interpreter system

UNIT - II

2.1.0 Understand Process management

- 2.1.1 Define process
- 2.1.2 Explain the different states of a process with state diagram
- 2.1.3 Explain process control block (PCB) with block diagram
- 2.1.4 Define a thread
- 2.1.5 Briefly explain the advantages of threads
- 2.1.6 Define multi-threading and hyper-threading
- 2.1.7 Distinguish between a program, a process and a thread

- 2.2.0 Understand CPU scheduling concepts**
 - 2.2.1 Describe the various scheduling queues, schedulers with queuing diagram
 - 2.2.2 Explain the use of medium term scheduler with diagram
 - 2.2.3 Explain context switch and dispatcher
 - 2.2.4 Briefly explain burst cycles: CPU and I/O with necessary graph
- 2.3.0 Understand CPU scheduling algorithms**
 - 2.3.1 Differentiate preemptive and non-preemptive scheduling
 - 2.3.2 Discuss the various scheduling criteria
 - 2.3.3 Explain FCFS, SJF, Priority, and RR scheduling algorithms with Gantt chart
 - 2.3.4 Discuss Multilevel and Multilevel feedback scheduling
- 2.4.0 Understand Process synchronization**
 - 2.4.1 Define Critical Section Problem
 - 2.4.2 Define deadlock
 - 2.4.3 Define various deadlock characterizations: mutual exclusion, hold & wait, No pre-emption, Circular wait.

UNIT – III

- 3.1.0 Understand memory management**
 - 3.1.1 State the need of address binding
 - 3.1.2 Compare logical and physical address spaces
 - 3.1.3 Discuss about swapping with diagram
 - 3.1.4 State the need of contiguous memory allocation
 - 3.1.5 Explain memory allocation methods: first fit, best fit, worst fit
 - 3.1.6 Define fragmentation
 - 3.1.7 Explain internal and external fragmentation with compaction
 - 3.1.8 Explain paging with paging hardware diagram
 - 3.1.9 Explain segmentation with segmentation hardware diagram
 - 3.1.10 Explain the advantages of segmentation with paging
- 3.2.0 Understand virtual memory**
 - 3.2.1 Understand the concept of virtual memory
 - 3.2.2 Explain demand paging
 - 3.2.3 Discuss the steps in handling page fault
 - 3.2.4 Explain page replacement algorithms: FIFO, optimal, LRU,
 - 3.2.5 Define the concept of thrashing
 - 3.2.7 Explain briefly about working set model and page – fault frequency.

UNIT – IV

- 4.1.0 Understand the file system**
 - 4.1.1 Discuss the file concept
 - 4.1.2 Explain file organisation concepts – sequential, indexed and direct
 - 4.1.3 Explain briefly different file operations
 - 4.1.4 Explain briefly directory structure – single level directory, two-level directory, three structured directories
 - 4.1.5 Explain file system structure with layered file system diagram
 - 4.1.6 Explain briefly different allocation methods – contiguous allocation, linked allocation, indexed allocation with diagrams
- 4.1.1 Understand I/O systems**
 - 4.1.2 Discuss the concept of I/O systems
 - 4.1.3 Explain I/O hardware with bus structure diagram
 - 4.1.4 Explain briefly Kernel I/O subsystem- I/O scheduling, buffering, and caching
 - 4.1.5 Explain the stream structure diagram
 - 4.1.6 Explain the disk structure
 - 4.1.7 Explain briefly the disk scheduling algorithms – FCFS, SSTF, SCAN, C- SCAN

UNIT –V

5.1.0 Understanding Linux

- 5.1.1 Understand the structure of Linux
- 5.1.2 Know kernel and shell
- 5.1.3 Know the Linux file systems
- 5.1.4 Describe briefly the different types of files
- 5.1.5 Know Linux commands viz. date, clear, tput, banner, cal, who, ls, cat, echo, exit, patch, mkdir, rmdir, chdir, cp, rm, mv, more, lp, file, wc, od, split, camp, comm, diff

5.2.0 Understand shell programming

- 5.2.1 Know the shell variable
- 5.2.2 Understand command substitutions
- 5.2.3 Know shell script
- 5.2.4 Know read statement
- 5.2.5 Understand command line arguments
- 5.2.6 Know the logical operators & & and !!
- 5.2.7 Know exit statement
- 5.2.8 Understand the conditional statement
- 5.2.9 Understand the looping statement
- 5.2.10 Know about process, PID
- 5.2.11 Understand process status
- 5.2.12 Describe systems processes
- 5.2.13 Know the mechanism of process creation
- 5.2.14 Differentiate the internal and external commands
- 5.2.15 Illustrate how to run jobs in back ground
- 5.2.16 Discuss the job control in the kern and bash shells

CONTENT OUTLINE

UNIT - 1: INTRODUCTION TO OS

Introduction to operating systems – Evolution systems –Views - Types of Operating System, Operating System components

UNIT – 2 : PROCESS MANAGEMENT

Process management concepts - process - process state - PCB – thread, CPU scheduling concepts - scheduling queues - schedulers - burst cycles, CPU scheduling algorithms - scheduling criteria, Process synchronization – CSP – deadlock – deadlock characterizations

UNIT -3: MEMORY MANAGEMENT

Memory management concepts - address binding - logical and physical address - swapping - contiguous memory allocation - Memory allocation methods - fragmentation – paging - segmentation - advantages of segmentation with paging – virtual memory

UNIT - 4: DEVICE MANAGEMENT & INFORMATION MANAGEMENT

File systems: Concept – file operations - directory structure -file system structure - allocation methods

I/O systems: Concepts - I/O hardware - Kernel I/O subsystem - stream structure -disk structure - disk management - disk scheduling algorithms

Mass Storage structure: Disk structure, disk scheduling – disk management, disk formatting - boot block- bad blocks

UNIT – 5: INTRODUCTION TO LINUX & SHELL PROGRAMMING

Introduction to LINUX – features of LINUX – structure of Linux – Basic Linux commands – Linux file system – types of files – file commands

Process – process status – systems processes – process creation

Shell variables – command substitutions – command line arguments – conditional statements – logical operators – looping statements – shell programming - - internal and external commands – running jobs in back ground – job control in the Kern and Bash shells

Reference Books:

1. Operating system concepts – Silberschatz, Galvin & Gagne (Wiley-6th Edition)
2. Modern Operating system – Tanenbaum
3. Unix concepts and applications – Sumithabha Das
4. Operating Systems - Balakrishnaprasad (Scitech Publishers)

SUBJECT TITLE : MICROPROCESSORS AND MICROCONTROLLERS
SUBJECT CODE : CT 403/ CM 403
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Introduction to micro processor	18
II	Microcontroller Architecture	18
	Test - I	2
III	Programming of 8051	18
IV	Microcontroller Interfacing	18
	Test - II	2
V	Microcontroller Applications	18
	Test - III	2
	Total	----- 96 =====

OBJECTIVES

UNIT - I

1.1.0 Understand the 8085 microprocessor

- 1.1.1 Define microprocessor
- 1.1.2 Draw the functional block diagram of 8085 microprocessor
- 1.1.3 Explain the functions of each block
- 1.1.4 List the general purpose register and special purpose register
- 1.1.5 Explain the functions of various registers
- 1.1.6 Define stack, stack pointer and program counter
- 1.1.7 Give the pin diagram of 8085 microprocessor and explain the functions of each pin
- 1.1.8 Discuss various signals like ALE, SO, SI, OF 8085
- 1.1.9 Discuss the instruction cycle fetch cycle
- 1.1.10 Discuss the four control signals IOR, IOW, MEMR, MEMW
- 1.1.11 Discuss the timing diagram for memory read, memory write, I/O read and I/O write

1.2.0 Understand the various data transfer methods

- 1.2.1 Discuss the various data transfer techniques
- 1.2.2 Explain programmed data transfer
- 1.2.3 Discuss about synchronous asynchronous and interrupt driven data transfer
- 1.2.4 Define DMA
- 1.2.5 List the advantage of DMA
- 1.2.6 Describe cycle stealing and burst mode data transfer in DMA
- 1.2.7 Define an interrupt
- 1.2.8 Discuss the types of interrupts in 8085
- 1.2.9 Explain the interrupt sequence of 8085
- 1.2.10 Discuss about restored interrupts polled interrupts
- 1.2.11 Explain different polling methods – hardware and software
- 1.2.12 Explain maskable and non maskable interrupts
- 1.2.13 Explain the use of interrupts with example
- 1.2.14 Distinguish between I/O mapped I/O and memory mapped I/O

UNIT – II

1.1.0 Understand micro controller architecture

- 1.1.1 Give introduction to micro controllers
- 1.1.2 Discuss the evolution of the micro controller
- 1.1.3 Explain features of micro controllers
- 1.1.4 Discuss the application of micro controller
- 1.1.5 Compare different micro controller – 8 bit 16 bit & 32 bit
- 1.1.6 Describe the pin details and architecture of 8051
- 1.1.7 Explain register structure of 8051
- 1.1.8 Explain special function register 8051
- 1.1.9 Explain different flags
- 1.1.10 Describe internal & external memory of 8051
- 1.1.11 Describe input output pins & ports of 8051
- 1.1.12 Explain counters & timers in 8051
- 1.1.13 Explain serial input/output of 8051
- 1.1.14 Explain interrupt in 8051
- 1.1.15 Describe power deduction modes
- 1.1.16 Discuss different instruction groups of 8051
- 1.1.17 Explain different address methods
- 1.1.18 Explain cross assembler operation manual

UNIT – III

5.1.1 Understand the programming of 8051

- 5.1.2 Explain the instruction set of 8051
 - 5.1.2.1 Data transfer
 - 5.1.2.2 Arithmetic
 - 5.1.2.3 Control transfer

3.2.0 Programming 8051

- 3.2.1 Prepare flowchart and write the programs for :
 - 3.2.1.1 Addition, multiplication, division of two byte and multi byte operands
 - 3.2.1.2 block transfer
 - 3.2.1.3 finding biggest number, average from a set
 - 3.2.1.4 Sorting, Searching
 - 3.2.1.5 Conversion from Hex to BCD
 - 3.2.1.6 Finding Square root
 - 3.2.1.7 Finding LCM, GCD
 - 3.2.1.8 design counter, time delay
 - 3.2.1.9 Serial communication
 - 3.2.1.10 interrupt handling

UNIT – IV

4.1.0 Understand 8255

- 4.1.1 Explain the PPI 8255 with the help of block diagram
- 4.1.2 Explain the I/O mode & Bit set/reset mode of operation
- 4.1.3 Explain the programming of 8255
- 4.1.4 Give illustration for the different modes of operation.

4.2.0 Understand 8257

- 4.2.1 Explain the DMA controller 8257 with the help of necessary block diagrams
- 4.2.2 Describe the control logic of 8257 & various modes of operation

4.3.0 Understand 8259

- 4.3.1 List the features of priority interrupt controller 8259
- 4.3.2 Describe 8259 with the necessary block diagram & pin configuration
- 4.3.3 Discuss the connection diagram of 8259 with the systems
- 4.3.4 Explain the two sets of command words

- 4.3.5 Discuss the priority modes in determining the priorities of the interrupt
- 4.4.0 Understand 8279**
 - 4.4.1 Explain the keyboard & display interface 8279 with the help of block diagram pen details
 - 4.4.2 Describe the keyboard & display sections
 - 4.4.3 Explain the programming of 8279
- 4.5.0 Understand 8251**
 - 4.5.1 State the user of programmable communication interface 8251
 - 4.5.2 Explain 8251 with the help of block diagram and pinpoint diagram
 - 4.5.3 Explain briefly about the transmitter & receiver section with the help of diagram
 - 4.5.4 Describe the programming of 8251
- 4.6.0 Understand 8253**
 - 4.6.1 State the use of Timer 8253
 - 4.6.2 Explain 8253 with the help of block diagram and pin details
 - 4.6.3 Discuss about the programming of 8253
 - 4.6.4 Explain the six modes of operation of 8253

UNIT – V

1.1.0 Applications of Microcontrollers

- 1.1.1 Realize the real time clock & display hours, minutes & seconds
- 1.1.2 Realize traffic light controller
- 1.1.3 Realize hex keyboard interface with the CPU using 8255 (maximum of 24 keys)
- 1.1.4 Realize seven segment display interface
- 1.1.5 Interface a stepper motor with the microcontroller
- 1.1.6 Interfacing DAC with the microcontroller
- 1.1.7 Interfacing ADC with the microcontroller

CONTENT DETAILS

UNIT – I:

INTRODUCTION TO MICROPROCESSORS

Definition - functional block diagram of 8085 – function of different blocks such as ALU, CPU, Accumulator, registers, stack and stack pointers, flag - data bus, pin diagram and functions of each pin

Various signals such as ALE, IO/M, SO & SI of 8085 – instruction cycle, fetch cycle, machine cycle and execute cycle – timing diagram for IOR, IOW, MEMR, & MEMW

Programmed data transfer – synchronous, asynchronous and interrupt driven – DMA transfer advantages – cycle stealing and burst modes

Interrupts – Polled and vectored interrupts – NMI & MI – I/O mapped I/O and memory mapped I/O – use of interrupts – interrupts of 8085

UNIT – II:

MICROCONTROLLER

microcontroller – architecture- evolution - features - application - various microcontroller - 8051 pin details and architecture - register structure- special function register - flags -internal & external memory - input output pins & ports - counters & timers - serial input/output - power deduction modes - instruction groups - different address methods -cross assembler operation manual

UNIT – III:

8051 PROGRAMMING

programming 8051- instruction set - Data transfer- Arithmetic - Control transfer - Programming - flowchart - programs - addition, multiplication, division, block transfer, Biggest number, Sorting, Searching, Hex to BCD, Square root , Average, LCM, GCD, counter , time delay, Serial communication, interrupt handling

UNIT – IV:

INTERFACING

Interfacing chips – Programmable Peripheral Interface, DMA Controller, Priority Interrupt Controller, Keyboard and Display Controller, Programmable Communication Interface, Timer – Architecture, interfacing and programming

UNIT – V:

MICROCONTROLLER APPLICATIONS

Digital clock, traffic light controller, hex keyboard interface, seven-segment display interface, stepper motor control, ADC interfacing, DAC interfacing.

REFERENCE BOOKS

1. Microprocessor and Microcontroller - R. Theagarajan – SCITECH
2. Microprocessor architecture, programming and applications with the 8085 - Ramesh S. Gaonkar
3. The 8051 Microcontroller and Embedded systems - Muhammed Ali Mazidi, Janice Gillipie Mazidi, (Pearson)
4. Microprocessor & its applications - R. Theagarajan, S. Dhanasekharan, S. Dhanapal
5. Microcontrollers - Raj Kamal (Perason)

SUBJECT NAME : COMPUTER COMMUNICATION AND NETWORKS
SUBJECT CODE : CT 404
PERIODS/WEEK : 5
PERIODS/SEMESTER : 80

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Concept of Computer Communication	14
II	Physical Layer	15
	Test 1	2
III	Data Link Layer	15
IV	Network layer	15
	Test 2	2
V	Routing, Higher layers & TCP/IP	15
	Model Test	2

		80
		=====

OBJECTIVES

UNIT – I

1.1.0 UNDERSTAND THE CONCEPT OF COMPUTER COMMUNICATION

- 1.1.1 Explain Data Communication
- 1.1.2 List the Characteristics of effective data communication
- 1.1.3 Explain briefly the components of data communication-message, center, receiver, medium, protocol
- 1.1.4 Discuss the network criteria-performance, reliability, security
- 1.1.5 Explain Protocols, standards
- 1.1.6 Discuss about Standards organizations
- 1.1.7 Explain briefly line configuration-point to point and multipoint
- 1.1.8 Explain briefly the topologies-mesh, tree, star, bus, ring, hybrid
- 1.1.9 Compare the transmission modes-simplex, half duplex, full duplex
- 1.1.10 Discuss the categories of network- LAN,MAN,WAN
- 1.1.11 Discuss Inter networks
- 1.1.12 Explain briefly the ISO – OSI model with the help of a block diagram
- 1.1.13 List the Functions of the layers
- 1.1.14 Distinguish between Analog and Digital Data
- 1.1.15 Explain Analog signals
- 1.1.16 Explain briefly Time and frequency domain
- 1.1.17 Discuss about composite signals
- 1.1.18 Explain frequency spectrum and bandwidth
- 1.1.19 Explain digital signals
- 1.1.20 Know about bit intervals and bit rate.

UNIT - II

2.1.0 UNDERSTAND PHYSICAL LAYER

- 2.1.1 Study of encoding-digital to digital, digital to analog, analog to digital, analog to analog
- 2.1.2 Know the encoding of digital to digital – Explain unipolar, polar, bipolar
- 2.1.3 Explain NRZ, RZ, Manchester , Differential Manchester
- 2.1.4 Know the encoding of analog to Digital- PAM, PCM, Nyquist Theorem
- 2.1.5 Know the encoding of Digital to Analog-Bit rate, Baud rate, ASK, FSK, PSK, QAM

- 2.1.6 Distinguish between Digital data transmission methods – serial, parallel transmission
- 2.1.7 Compare Synchronous Vs asynchronous data transmission
- 2.1.8 Study of DTE and DCE
- 2.1.9 Study of EIA 232
- 2.1.10 Understand Modems – Transmission rate, bandwidth, speed
- 2.1.11 Discuss modem standards - Bell modems, ITU-T
- 2.1.12 Briefly explain Cable modem
- 2.2.0 UNDERSTAND TRANSMISSION MEDIA**
 - 2.2.1 Compare the transmission Media-Guided and unguided
 - 2.2.2 Explain briefly Twisted pair: Shielded and unshielded - construction, characteristics, standards
 - 2.2.3 Explain briefly Coaxial cable- construction, characteristics, standards
 - 2.2.4 Explain briefly the Optical Fiber - construction, characteristics, standards, propagation mode, single mode, multimode(step index, graded index)
 - 2.2.5 List the advantages and disadvantages of Optical Fiber
 - 2.2.6 Know the types of propagation – Terrestrial microwave, satellite communication
 - 2.2.7 Understand transmission Impairment – attenuation ,Distortion, noise
- 2.3.0 UNDERSTAND MULTIPLEXING**
 - 2.3.1 Explain Multiplexing
 - 2.3.2 Discuss FDM, WDM, TDM - synchronous, Bit stuffing, asynchronous
 - 2.3.3 Discuss Inverse Multiplexing

UNIT – III

3.1.0 UNDERSTANDING DATALINK LAYER

- 3.1.1 Discuss types of Errors, Single bit burst error
- 3.1.2 Explain Flow Control – Stop and Wait, Sliding window
- 3.1.3 Study of error Control – Explain Stop and wait ARQ, Sliding window ARQ- Go Back n Selective Reject
- 3.1.4 Understand Data Link Protocol
- 3.1.5 Explain Asynchronous Protocol – XMODEM, YMODEM, ZMODEM, BLAST, Kermit
- 3.1.6 Explain Synchronous Protocol – Character Oriented, Bit Oriented
- 3.1.7 Describe binary Synchronous Communication – Control Characters, Frames, Header, Multiblock, Multiframe, Control frame
- 3.1.8 Discuss data Transparency
- 3.1.9 Explain HDLC – Station types, configurations, modes, NRM, ARM, ABM, Frames
- 3.1.10 Explain Flag Fields, address fields, control field, information field
- 3.1.11 Know S-frames, U-frames
- 3.1.12 Discuss bit Stuffing

UNIT - IV

4.1.0 UNDERSTANDING NETWORKS LAYER

- 4.1.1 Understand Local Area Networks
- 4.1.2 Know Project 802
- 4.1.3 Explain LLC, MAC,PDU
- 4.1.4 Discuss Ethernet – Baseband, Broadband
- 4.1.5 Explain Access Method – CSMA, CSMA/CD
- 4.1.6 Know the frame Format
- 4.1.7 Discuss the implementation of Ethernet
- 4.1.8 Explain Fast Ethernet, Gigabit Ethernet
- 4.1.9 Discuss Token Bus
- 4.1.10 Discuss Token Ring
- 4.1.11 Discuss FDDI
- 4.1.12 Compare Ethernet, Fast Ethernet, Gigabit Ethernet, Token Ring, FDDI
- 4.1.13 Understand Metropolitan Area Network
- 4.1.14 Discuss IEEE 802.6(DQDB), SMDS

- 4.1.15 Explain Circuit Switching – Space division switching, time division switching
- 4.1.16 Explain Packet Switching – datagram approach, Virtual Circuit approach (SVC, PVC)
- 4.1.17 Know Message switching
- 4.1.18 Discuss SLIP, PPP, LCP, PAP, NCP, IPCP
- 4.1.19 Explain ISDN – Services, History, Channels (B Channel, D Channel, H Channel)
- 4.1.20 Study ISDN Layers
- 4.1.21 Discuss X.25 – layers
- 4.1.22 Know Frame Relay
- 4.1.23 List the advantages and Disadvantages of frame relay
- 4.1.24 Discuss Frame Relay Layers
- 4.1.25 Discuss Congestion Control
- 4.1.26 Explain congestion avoidance BECN, FECN
- 4.1.27 Explain Leaky Bucket Algorithm
- 4.1.28 Discuss Traffic Control
- 4.1.29 Discuss ATM- architecture

UNIT – V

5.1.0 UNDERSTAND ROUTING , HIGHER LAYERS AND TCP/IP

- 5.1.1 Understand Networking and Internetworking Devices
- 5.1.2 Discuss Repeaters, Bridges, Routers, Gateway
- 5.1.3 Know the routing Algorithms
- 5.1.4 Explain Distance vector routing
- 5.1.5 Explain Link state Routing, Dijkstra Algorithm
- 5.1.6 Understand Transport layer
- 5.1.7 Study of duties of the transport layer in detail
- 5.1.8 Discuss Session layer
- 5.1.9 Discuss Presentation layer
- 5.1.10 Know Encryption / Decryption
- 5.1.11 Explain Data encryption standards-public key, private key
- 5.1.12 Discuss Authentication
- 5.1.13 Explain Data compression
- 5.1.14 Understand Application Layer
- 5.1.15 Explain TCP/IP
- 5.1.16 Compare TCP/IP and OSI
- 5.1.17 Know Datagram
- 5.1.18 Explain Addressing
- 5.1.19 Explain Subnetting
- 5.1.20 Discuss Client, Server, DHCP, DNS, Telnet, NVT, FTP, TFTP, SMTP, POP, SNMP, HTTP

CONTENT OUTLINE

UNIT I

Computer communication-Data Communication-components of data communication-message, sender, receiver, medium, protocol , standards-point to point and multipoint- topologies- transmission modes-LAN,MAN,WAN- ISO – OSI model- Analog and Digital Data- Time and frequency domain-bandwidth- bit intervals and bit rate

UNIT - II

PHYSICAL LAYER- encoding-digital to digital, digital to analog, analog to digital, analog to analog-unipolar, polar, bipolar-NRZ, RZ, Manchester , Differential Manchester-analog to Digital- encoding of Digital to Analog-Bit rate, Baud rate, ASK, FSK, PSK, QAM- serial, parallel transmission-Synchronous Vs asynchronous data transmission- DTE and DCE- EIA 232-Modems -Cable modem-

TRANSMISSION MEDIA -transmission Media-Guided and unguided-Twisted pair-Coaxial cable-optical Fiber-types of propagation – Terrestrial microwave, satellite communication-Impairment – Multiplexing- FDM, WDM, TDM

UNIT – III

DATALINK LAYER-types of Errors-Flow Control – Stop and Wait, Sliding window- Stop and wait ARQ, Sliding window ARQ- Go Back n Selective Reject- Data Link Protocol -binary Synchronous Communication- data Transparency-HDLC-Flag Fields, address fields, control field, information field-S-frames, U-frames - bit Stuffing

UNIT - IV

NETWORKS LAYER-Local Area Networks-LLC, MAC,PDU-Ethernet – Baseband, Broadband-Medium Access Method – CSMA, CSMA/CD-Fast Ethernet, Gigabit Ethernet- Token Bus- Token Ring- FDDI-Metropolitan Area Network- IEEE 802.6(DQDB), SMDS- Circuit Switching – Packet Switching – datagram approach,- Message switching-ISDN – ISDN - X.25 – layers-frame relay- Congestion Control- Leaky Bucket Algorithm-

UNIT – V

Networking and Internetworking Devices- Repeaters, Bridges, Routers, Gateway- routing Algorithms-Distance vector routing- Link state Routing, Dijkstra Algorithm-Transport layer-Transport layer- Session layer-Presentation layer-Encryption / Decryption- Application Layer-TCP/IP-Datagram-Subnetting-client, Server, DHCP, DNS, Telnet, NVT, FTP, TFTP, SMTP, POP, SNMP, HTTP

References :

1. Data Communications and Networking 2nd Ed.– Behrouz A Forouzan, TMH P Co. Ltd.
2. Computer Networks - Tannenbaum PHI P Co. Ltd.
3. Data Communication & Networks - William Stalling
4. Data Communications, Computer Networks and Open Systems – Fred Halsall , Pearson Education
5. Principles of Digital Communication Systems and Computer Networks – Dr. KVKK Prasad, Dreamtech Press

SUBJECT TITLE : HARDWARE LAB II(MICROCONTROLLERS)
SUBJECT CODE : CT405
PERIODS PER WEEK : 3
PERIODS PER SEMESTER : 48

LIST OF EXERCISES

Programming 8051

write the programs such as:

- i) addition
- ii) multiplication
- iii) division
 - (1) of two byte
 - (2) multi byte operands
- iv) block transfer
- v) Biggest number
- vi) Sorting
- vii) Searching
- viii) Hex to BCD
- ix) Square root
- x) Average of a set values
- xi) LCM
- xii) GCD
- xiii) counter
- xiv)time delay
- xv) Serial communication
- xvi)interrupt handling

Implement the following

- 1 Digital clock -Realize the real time clock & display hours, minutes & seconds
Describe the program with a flow chart
- 2 Traffic light controller, Implement a traffic control sequence Give a typical road function to implement the controller Draw the flow chart Write the program
3. Hex keyboard interface , Interface a hex keyboard with the CPU using 8255 (maximum of 24 keys) Write the program with the help of the flow chart Design a seven segment display interface Interface a set of seven segment modules using 8255 & display a message
Generate the program
4. Interface a stepper motor with the microcontroller kit
5. Interfacing DAC with the microcontroller kit
6. Interfacing ADC with the microcontroller kit

SUBJECT TITLE : SOFTWARE LAB -IV(RDBMS)
SUBJECT CODE : CT 406
PERIODS/WEEK : 3
PERIODS/SEMESTER : 48

LIST OF EXERCISES

1. Exercises for Creating, Inserting, Updating, tables
2. Exercises for creating tables with constraints NULL, DEFAULT,CHECK, PRIMARY KEY, UNIQUE, , referential Integrity, creating indexes
3. Exercises for retrieval of information using SELECT statements with WHERE, ORDER BY clause and deleting records
4. Exercises for retrieval of information with aggregate functions and group by, having clauses
5. Exercises for nested queries, correlated sub queries, exists and unique functions
6. Exercises for joining table, creating views with different types of select queries
7. Experiment using triggers
8. Experiment using cursors
9. Experiment using stored procedures
10. Database application development using ODBC with front end tools for the following operations
 - a. Select data from table
 - b. Information searching
 - c. Updating table using stored procedureExamples: Employee salary calculation, Student details
11. Exercises for embedded SQL with C or Java host language
 - a. Inventory control – stock, purchase, sales
 - b. Payroll
 - c. Reservation

SUBJECT TITLE : SOFTWARE LAB-V (APPLICATION DEVELOPMENT)
SUBJECT CODE : CT 407
PERIODS/WEEK : 3
PERIODS/SEMESTER: 48

Students have to perform individual mini project works based on any one of the programming tools (C, C++, Java, VB , RDBMS)

Proper importance shall be given to the Application Development Lab of 4th Semester. Students have to study (Requirement Analysis), design and develop a simple software application using any one of the programming languages or tool studied. Each student must develop an application individually. The development is strictly inside the software lab. Teachers are requested to monitor it weekly. Specific suggestions/guidance on selecting the application and/or programming tool will be given to the students.

A rough record of activities involved shall be prepared by the students weekly and submitted to the staff in charge for verification, correction as well as guidance. The Fair record shall contain the following activities: Feasibility Study, Requirement Analysis, Design, Code, Testing and Implementation.

Examination will be based on a problem situation (Simple application) given by the examiners and the student will have to answer the question clearly giving the stages in software development.

SUBJECT OF STUDY AND SCHEME OF EVALUATION

BRANCH: COMPUTER ENGINEERING

Semester 5

Code	Subject	Periods Per Week			Evaluation (Marks)			
		Theory	Practical/Tutorial	Total	Theory	Practical	Internal	Total
CT501	System Software	5	1	6	75		25	100
CT502/ IF502	Web Technology	5	1	6	75		25	100
CT503/ CM503	Network Programming	5	1	6	75		25	100
CT504/ CM504	Advanced Microprocessors	5	0	5	75		25	100
CT505	Software Lab –VI (Data Structures)		3	3		75	25	100
CT506	Software Lab – VII (Operating Systems)		3	3		75	25	100
CT507	Software Lab – VIII (Visual C++)		3	3		75	25	100
	Project & Seminar		3	3				
	TOTAL	20	15		300	225	175	700

SUBJECT TITLE : SYSTEM SOFTWARE
SUBJECT CODE : CT 501
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	Assembler, Macros, and Loaders	18
II	Linkers and Loaders	18
	Test – I	2
III	Principles of Programming Language	18
	Test - III	2
IV	Compilers	18
V	Compiler – Code generation	18
	Test – II	2

		96
		=====

OBJECTIVES

UNIT – I

1.1.0 Understanding Assemblers

- 1.1.1. Explain basic assembler functions
- 1.1.2. Explain the general design procedures
 - 1.1.2.1. Specify the problems
 - 1.1.2.2. Specify data structures
 - 1.1.2.3. Specify format of data base
 - 1.1.2.4. Discuss Algorithms
 - 1.1.2.5. Study Pass1 process with flowchart
 - 1.1.2.6. Study pass2 process with flowchart

1.2.0 Understanding Macros

- 1.2.1. Define Macros instructions
- 1.2.2. Describe the format of macro instructions
- 1.2.3. Study Instruction arguments
- 1.2.4. Understand Conditional macro expression
- 1.2.5. Define Macro call
- 1.2.6. Implementation

UNIT II

2.1.0 Understanding Loaders and Linkers

- 2.1.1 Describe the basic loading functions
- 2.1.2 Discuss absolute loaders
- 2.1.3 Discuss compile and go loaders
- 2.1.4 Discuss subroutine linking
- 2.1.5 Describe relocating loaders
- 2.1.6 State and explain direct linking loaders
- 2.1.7 Discuss loader schemes, binder, linking loaders, overlays, dynamic binders
- 2.1.8 Study different types of binders
- 2.1.9 Explain about dynamic loaders, dynamic linking,
- 2.1.10 Design of direct linking loaders

UNIT III

3.1.0 Understand Principles of Programming Language

- 3.1.1 Study Concepts of programming languages
- 3.1.1 Discuss Programming domains
- 3.1.2 Discuss about language evaluation criteria
 - 3.1.2.1 Describe Readability
 - 3.1.2.2 Describe Write ability
 - 3.1.2.3 Describe Reliability
 - 3.1.2.4 Describe Cost

3.2.1 Discuss Evolution of programming languages

3.3.1 Discuss the different types of languages

- 3.3.1.1 Explain Functional based
- 3.3.1.2 Explain Business based
- 3.3.1.3 Explain Dynamic based
- 3.3.1.4 Explain Logic based
- 3.3.4.5 Explain OOPs based
- 3.3.4.6 Explain WWW based

3.4.1 Understand Sequence control -Expression and Assignment Statements

- 3.4.1.1 Study Sequence control in Arithmetic expressions
- 3.4.1.2 Study Sequence control in Expressions where Operator in direct order
- 3.4.1.3 Study Sequence Control - Overloaded operators

3.5.1 Understand Sequence control - Statement level control

- 3.5.1.1 Study Sequence control in Compound statement
- 3.5.1.2 Study Sequence control - Selection of statement
- 3.5.1.3 Study Sequence control - Multiple selection
- 3.5.1.4 Study Sequence control - Iterative statements

3.6.1 Understand Sub program control

- 3.6.1.1 Identify Sub program characteristic
- 3.6.1.2 List Basic differences
- 3.6.1.3 List Parameters
- 3.6.1.4 Study Procedures and functions
- 3.6.1.5 Discuss Local reference
- 3.6.1.6 Understand Pass by value
- 3.6.1.7 Understand Pass by result
- 3.6.1.8 Understand Pass by reference

UNIT – IV

4.1.0 Understand compilers

- 4.1.1 Define compiler
- 4.1.2 State need for a compiler
- 4.1.3 Explain the structure of a compiler
- 4.1.4 Recognize basic elements
- 4.1.5 Explain Syntactic rules & intermediate meaning
- 4.1.6 Explain Code generation
- 4.1.7 Understand general model of a compiler
- 4.1.8 Explain Structure of a compiler
- 4.1.9 Discuss phases of a compiler

4.2.0 Understand lexical analysis

- 4.2.1 State the functions of a lexical analyzer
- 4.2.2 Discuss source program, terminal table, identifier and uniform symbol tables
- 4.2.3 Explain the Algorithm

4.3.0 Understand syntax analysis

- 4.3.1 Discuss uniform symbol table
- 4.3.2 Explain functions stack

- 4.3.3 Understand reduction
- 3.3.3. Explain the algorithm
- 4.4.0 Understand the interpretation phase**
 - 4.4.1 Explain the stack, identifier table, temporary storage table
 - 3.4.2 Explain the algorithm
 - 3.4.3 Discuss the interaction with lexical, syntax and interpretation phases

UNIT V Compiler II

5.1.0 Understand the storage assignment and code generation

- 5.1.1 Explain the identifier table, literal table & matrix
- 5.1.2 Explain the algorithm
- 5.1.3 Discuss the code production (macro identifier)
- 5.1.4 Explain the algorithm

5.2.0 Understand the Assembly phase

- 5.2.1 Discuss the Identifier table
- 5.2.2 Discuss the literal table
- 5.2.3 Explain the object code
- 5.2.4 Explain the algorithm

5.3.0 Understand Passes of a Compiler

- 5.3.1 Explain the different passes
- 5.3.2 Explain the flowchart with different phases

CONTENT DETAILS

UNIT I

Assemblers - assembler functions – general design procedures - statement of problems -data structure - format of data base – Algorithms - Pass1 process - Pass2 process
 Macros - Macro instructions - format of macro instructions - Instruction arguments -Conditional macro expression - Macro call - Implementation

UNIT II

Loaders and Linkers - basic loading functions - absolute loaders - compile and go loaders - subroutine linking - relocating loaders - direct linking loaders - loader schemes, binder, linking loaders - dynamic loaders, overlays, dynamic binders, direct linking loaders

UNIT – III Programming languages

Principles of Programming Language, concepts, programming domains, evaluation criteria, Readability, Writability, Reliability, Cost
 Evolution, different types, - Functional based, Business based, Dynamic based, Logic based, OOPs based, W.W.W based, Expression and Assignment Statements (Sequence control)- Arithmetic, Operator in direct order, Overloaded operators, Statement level control- Compound statement, Selection of statement, Multiple selection, Iterative statements, - Sub program control- Sub program characteristic, Basic differences, Parameters, Procedures and functions, Local reference, Pass by value, Pass by result, Pass by reference

UNIT – IV Compiler

Compilers- compiler –need - structure - basic elements - syntactic rules & intermediate meaning
 Code generation , general model- Structure- phases- lexical analysis - functions, source program, terminal table, identifier and uniform symbol tables, Algorithm
 Syntax analysis -Uniform symbol table - stack, reduction - algorithm
 interpretation phase - stack, identifier table, temporary storage table, algorithm
 Interaction with lexical, syntax and interpretation phases

UNIT V Compiler II

Storage assignment and code generation - identifier table, literal table & matrix, algorithm, code production (macro identifier), algorithm

Assembly phase - Identifier table, literal table, object code, algorithm

Passes of the Compiler, different passes, flowchart with different phases

REFERENCE BOOKS

1. Systems programming – John J Donovan
2. Principles of programming language - Robert N Sebesta – (Pearson)
3. Principles of compiler design – Alfred V. Aho & J.D Uttman
4. System software – Introduction to system Programming- Leland L Beck –(Pearson)
5. Concepts of Programming languages - Pratt

SUBJECT TITLE : WEB TECHNOLOGY
SUBJECT CODE : CT502 / IF502
PERIODS/WEEK : 6
PERIODS/ SEMESTER : 96

TIME SCHEDULE

UNIT	TOPIC	PERIODS
1.	Introduction to Web Technology	16
2.	HTML , client side scripting	18
	Test1	2
3.	Server Side Scripting – PHP	20
4.	File Handling & Database Connectivity in PHP	20
	Test 2	2
5.	Web Hosting and Optimization	16
	Test 3	2
	Total	96

OBJECTIVES

UNIT -I

1.0 UNDERSTAND INTERNET FUNDAMENTALS

- 1.1 Discuss Internet, Intranet, Extranet
- 1.2 Study of Various Internet Services: www, e-mail, e-commerce, telnet, search engines, FTP, News groups, Bulletin Boards
- 1.3 Study Various types of Internet Connections: DSL, Dial-up, ISDN, Cable Modem and Wire-less
- 1.4 Understand Client-server Architecture, Browsers, Server Software
- 1.5 Understand Internet Protocols: TCP/IP, HTTP, SMTP, FTP, TELNET
- 1.6 Understand IP address, Domain name, Domain name server, IPv4 Vs IPv6
- 1.7 Describe the Role of ISPs
- 1.8 Study Proxy Server
- 1.9 Study Internet Security and Firewall
- 1.10 Discuss Server Software: PWS, IIS, Java Web Server, Apache
- 1.11 Understand Installation Procedure of SERVER Software
- 1.12 Compare Administrative features of IIS and Apache Web Servers
- 1.13 List Internet Applications : e-commerce, e-governance, e-banking.

UNIT – II

2.0 UNDERSTAND HYPER TEXT MARKUP LANGUAGE AND CLIENT SIDE SCRIPTING

- 2.1 Understand Hyper Text and HTML
- 2.2 Understand the format of a HTML page.
- 2.3 Differentiate between Empty tag and Container tag
- 2.4 Study the basic tags in HTML- <html>, <head>, <title>, <body>, HTML comment
- 2.5 Study the heading tags <h1> to <h6> and <P>, <DIV>,
, <NOBR>,
- 2.6 Understand the Text Formatting tags
- 2.7 Know Content based text formatting tags (cite, code, dfn, em, kbd, samp, strong, var)
- 2.8 Study Physical text formatting tags - , <big>, <blink>, <I>, <s>, <small>, <sub>, <sup>, <tt>, <u>
- 2.9 Understand Lists

- 2.10 Study of Ordered , Unordered List tags, Definition Lists - , ,, <DL>, <DT>, <DD>
- 2.11 Embedding Images -
- 2.12 Study tags <hr>, <map>, <meta>
- 2.13 Understand Hyperlink and anchor tag <A href>
- 2.14 Link within a page, to another page in the computer system, to another web page , to another service such as e-mail
- 2.15 Understand Table and Frames
- 2.16 Study tags <table>, <TR>, <td>, <th>,
- 2.17 Study tags <frameset>, <frame>, <Noframes>
- 2.18 Understand Forms
- 2.19 Study tag <Form> - name, action, method, type, value attributes
- 2.20 Study Form control tags –<input>, <selection>, <option> for Textbox, password, text area, check box, radio button, menu, button, combo box
- 2.21 Implement multimedia in html pages – audio and video
- 2.22 Embed scripting in html <script> tag
- 2.23 Discuss DHTML, XML
- 2.24 Study Cascading Style Sheets

3.0 UNDERSTAND JAVA SCRIPT

- 3.1 State the need for script languages
- 3.2 Differentiate between server side scripting and client side scripting
- 3.3 Compare JavaScript and VBScript
- 3.4 Outline the method of adding script to html pages
- 3.5 Discuss the comments in JavaScript
- 3.6 Discuss the Document Object Model
- 3.7 Discuss the level0 HTML Document Object Model
- 3.8 Describe Objects, Methods and Properties
- 3.9 Explain the properties of Document Object
- 3.10 Explain the methods of Document Object
- 3.11 Explain Form Collection – properties, methods
- 3.12 Explain Image Collection- Properties
- 3.13 Discuss the different types of objects – W3COM, Built-in, Custom
- 3.14 Discuss the keywords
- 3.15 Describe the variables and lifetime of variables – local, global
- 3.16 Study the various operators - arithmetic, assignment, comparison, logical, string
- 3.17 Explain functions, function calling and return value
- 3.18 Study the Conditional statements
- 3.19 Study of if, if Else statement
- 3.20 Study of switch statement
- 3.21 Study of ternary (conditional statement)
- 3.22 Explain the different Looping statements
- 3.23 Study of while loop
- 3.24 Study of do ... while loop
- 3.25 Study of for loop
- 3.26 Compare while, do .. while , for loops
- 3.27 Study of break statement
- 3.28 Study the events – window events and user events
- 3.29 Study the built-in objects - String objects, Date Objects, Math objects
- 3.30 Understand array in JavaScript
- 3.31 Describe array handling and array methods
- 3.32 Study of Window - properties and methods
- 3.33 Discuss about reusable functions and external JavaScript files
- 3.34 Study of Form validation - text fields, select box, Radio button, Checkboxes, Text area- Reset and submit

- 3.35 Discuss Image Rollover
- 3.36 Discuss about Random script Generator
- 3.37 Discuss pop-up windows

UNIT – III

4.0 UNDERSTAND SERVER SIDE SCRIPTING - PHP

- 4.1 Study the Evolution of PHP
- 4.2 State the advantages of PHP
- 4.3 Describe the working of PHP
- 4.4 Study Apache Server
- 4.5 Installation of Apache and MySql
- 4.6 Discuss Configuration and Administration of Apache Server
- 4.7 Study the PHP environment creation
- 4.8 Study the Installation of PHP
- 4.9 Configure Apache for PHP
- 4.10 Outline testing PHP installation
- 4.11 Study Escape characters in PHP
- 4.12 Identify reserved words in PHP
- 4.13 Study Functions and function arguments
- 4.14 Explain Multiple arguments
- 4.15 Understand PHP operators
- 4.16 Study Arithmetic operators
- 4.17 Study Logical operators
- 4.18 Study Assignment Operator
- 4.19 Study Comparison operators
- 4.20 Study Conditional operator
- 4.21 Understand Branching and Loop Control
- 4.22 Study Conditional if statement
- 4.23 Study - if ... else statement
- 4.24 Study switch statement
- 4.25 Study Conditional operator statement
- 4.26 Study Functions and Return statement
- 4.27 Study For loop
- 4.28 Study while loop
- 4.29 Study do-while loop
- 4.30 Study interrupting loop – break
- 4.31 Understand array concept
- 4.32 Explain creation of an array
- 4.33 Study array processing – foreach(), sizeof(), , count(), array_unshift(), array_push() , array_pop(), sort(), rsort(), asort(), arsort()
- 4.34 Study array key-value pair
- 4.35 Discuss One based indexing
- 4.36 Study array_merge(), array_slice(), shuffle()
- 4.37 Understand the concept of Dynamic Content
- 4.38 Discuss environment variables- getenv(), preg_match(),
- 4.39 Study Server date and time manipulation – date()
- 4.40 Study rand(), srand(), microtime()
- 4.41 Study of form submission and related events
- 4.42 Discuss string Manipulation – strlen(), strev(), strtoupper(), strtolower(), ucwords()
- 4.43 Study Browser Redirection – header()

UNIT – IV

5.0 UNDERSTAND FILE HANDLING DATABASE CONNECTIVITY

- 5.0 Study Displaying directory files
- 5.1 Study copying and renaming files
- 5.2 Study deleting files
- 5.3 Study opening and closing files, reading and writing files
- 5.4 Understand Data Persistence
- 5.5 Study cookies and sessions
- 5.6 Study of sending email with PHP – enabling PHP email, creating feedback form, sending plain text email, html email, creating attachment, adding error checking, validating email address formats
- 5.7 Understand MySQL with PHP
- 5.8 Study to Create MySQL user and Password, Connectivity to MySQL
- 5.9 Study creating database, deleting database, creating database table, Inserting data to table, altering tables, retrieving data from a database
- 5.10 Study creating a user table, user authorization, user log-in

UNIT V

6.0 UNDERSTAND WEB DESIGN ISSUES, OPTIMIZATION AND DEVELOPMENT TOOLS

6.0 Understand web design issues

- 6.1.1 Know the Web flow
- 6.1.2 Know Preparation of checklist for designing
- 6.1.3 Design the navigation and links within site
- 6.1.4 Develop Site Map
- 6.1.4 Specify the objectives of web page
- 6.1.5 Develop storyboard for the website

6.1 Understand Web optimization

- 6.2.1 Minimize HTTP requests
- 6.2.2 Process JavaScript's first
- 6.2.3 Have consistent approach for all pages
- 6.2.4 Convert as many buttons as possible to text links
- 6.2.5 Use CSS over JavaScript and Applets
- 6.2.6 Cut down White space
- 6.2.7 Cut down redundant tags
- 6.2.8 Choose the right DOCTYPE
- 6.2.9 Eliminate optional quotes

6.2 Discuss Web promotion techniques

6.3 Discuss Luring search Engines

- 6.4.1 Understand the importance of Meta tag
- 6.4.1 Understand the importance of content in a web site
- 6.4.2 Select proper keywords
- 6.4.3 Avoid images only pages
- 6.4.4 Get linked with other websites
- 6.4.4 Link all your pages
- 6.4.5 Use text links instead of image links
- 6.4.6 Minimize JavaScripts and Flash
- 6.4.7 Have Simple URLs
- 6.4.8 Understand Search Engine Robots

6.4 Study Testing your Web sites

- 6.5.1 Understand Visual acceptance testing
- 6.5.2 Understand Functionality testing
- 6.5.3 Understand Content testing
- 6.5.4 Understand System and Browser Compatibility testing

- 6.5.5 Understand Delivery testing
- 6.5 Discuss Debugging Web Sites
- 6.6 Discuss maintenance of web pages
- 6.7 Design an E-commerce Web site
- 6.8 Discuss influence of changing standards (in tune with the development of hardware, software and communication) in Design, Development, Optimization, Testing and Maintenance of Web Sites.

7.0 UNDERSTAND WEB HOSTING AND WEB DEVELOPMENT TOOLS

- 7.0 Discuss Web Hosting
- 7.1 Domain name Registration
- 7.2 Discuss Server space hiring
- 7.3 Explain File Uploading procedure
- 7.4 Discuss FTP utilities
- 7.5 Discuss Web portals
- 7.6 Understanding Web design tools
- 7.7 Discuss the features of Frontpage
- 7.8 Discuss the features of Dreamweaver
- 7.9 Discuss the features of Flash
- 7.10 Discuss the features of Photoshop

OBJECTIVES

UNIT -I

Internet, Intranet, Extranet- Internet Services- Internet Connections-Client-server Architecture- Browsers- Server Software - Internet Protocols- IP address, Domain name- Proxy Server - Internet Security and Firewall - Server Software -Internet Applications

UNIT - II

Hyper Text and HTML - Empty tag and Container tag – tags and attributes- Text Formatting tags- Lists - Embedding Images - Hyperlink and anchor tag - Table and Frames – Forms –multimedia - scripting - DHTML, XML, Cascading Style Sheets.
Scripting languages-server side scripting and client side scripting, JavaScript and VBScript
JavaScript-Document Object Model, Objects, Methods and Properties, Form Collection , Image, W3COM, Built-in, Custom-variables and lifetime, operators, functions, conditional statements, Looping - window events and user events- built-in objects- array - Window - Form validation - Image Rollover - Random script Generator, pop-up windows

UNIT – III

Server side scripting- PHP, Apache , MySQL -Escape characters in PHP, reserved words in PHP, PHP operators, Branching and Loop Control, Functions, array , Server date and time manipulation – form events - string Manipulation – Browser Redirection

UNIT – IV

File manipulation, uploading, Cookies and sessions -email, feedback form
MySQL with PHP- Connectivity to MySQL- Manipulation of tables and databases.

UNIT V

Web Design issues-Web optimization methods. Web promotion techniques- Luring search Engines - Search Engine Robots . Testing Web sites- Debugging Web Sites- Maintenance of web pages-E-commerce Web site

Web Hosting- Domain name registration-Server space allocation-File Uploading procedure-FTP utilities-Web portals

Web design tools: Frontpage, Dreamweaver, Flash, Photoshop

References :

1. Programming the World Wide Web (Second Edition) -Robert W.Sebesta
(Pearson Education)
2. Beginning Web Programming with HTML, XHTML, CSS & JavaScript
– John Duckett (Wiley DreamTech)
3. Web publishing – Monica D’Souza, Jude D’Souza- (Tata Mc Graw Hill)
4. PHP and MySQL Web Development - Welling – (Pearson Education)
5. Sams teach Yourself PHP in 24 hours – Zandstra – (Pearson Education)
6. PHP fast and easy web development – Meloni – (Prentice Hall of India)

Debugging Web Sites :

1. www.drhtml.com
2. www.netmechanic.com
3. www.siteinspector.com
4. www.websitegarage.com

SUBJECT TITLE : NETWORK PROGRAMMING
SUBJECT CODE : CT503/CM503
HOURS/WEEK : 6
HOURS/SEMESTER : 96

TIME SCHEDULE

UNIT	TOPIC	PERIODS
1	Streams	18
2	Sockets	18
	Test	02
3	Remote Method Invocation (RMI)	18
4	Threads	18
	Test	02
5	Naming Services & RMI Runtime	18
	Test	02
<hr/>		
Total		96

Objectives

UNIT I

- 1 **JAVA Programming**
 - 1.1 Revise Java Servlets and Applets
 - 1.2 Revise Java Virtual Machine
 - 1.3 Discuss AWT controls
 - 1.4 Discuss Event Handling
 - 1.5 Distinguish between console programs and window (GUI) programs.
 - 1.6 Discuss Java Beans and Java Swing

UNIT II

2. **Understand Streams**
 - 1.1 Understand Input Stream: Reading Data, Stream navigation
 - 1.2 Understand IOException
 - 1.3 Understand Output Stream: Writing Data, Resource management
 - 1.4 Implement Viewing a File (program)
 - 1.5 Understand Layering Streams
 - 1.6 Implement Compressing a File (program)
 - 1.7 Streams, Reusability, and Testing
 - 1.8 Understand DataInputStream and DataOutputStream.

UNIT III

3. **Sockets**
 - 3.1 Study Sockets
 - 3.2 Study socket programming concepts
 - 3.3 Implement Creating a Socket (Program)
 - 3.4 Study protocols and Meta data
 - 3.5 Implement Server Sockets
 - 3.6 Customizing Socket behavior
 - 3.7 Special purpose Sockets
 - 3.8 Implement Direct Stream Manipulation

- 3.9 Understand Subclassing Sockets
- 3.10 Implement special purpose Sockets
- 3.11 Understand Secured Socket Layer (SSL)
- 3.12 Implement Socket Based Printer Server
- 3.13 Understand Spooling

UNIT IV

4. Remote Method Invocation (RMI)

- 4.1 Understand Basic Structure of RMI
- 4.2 Study Serialization
- 4.3 Implement basic objects of RMI
- 4.4 Implement a client application using RMI
- 4.5 Understand Client Side Caching
- 4.6 Design Remote Interface
- 4.7 Understand Common Object Request Broker Architecture (CORBA)

UNIT V

5. Threads

- 5.1 Understand concept of multiple clients
- 5.2 Study basic terminology – Calling stack, Heap, Threads, Mutex
- 5.3 Study Threading Concepts
- 5.4 Study Thread programming concepts
- 5.5 Understand Controlling Individual Threads
- 5.6 Understand Coordinating Thread Activities
- 5.7 Understand Cache Management
- 5.8 Assigning priorities to Threads
- 5.9 Study support for Threads in Java
- 5.10 Study Thread manipulation methods defined on Object
- 5.11 Understand Threading and RMI
- 5.12 Implement Threading
- 5.13 Study guidelines for Threading
- 5.14 Understand Using Container Classes
- 5.15 Understand Inter-thread Communication
- 5.16 Study Creation Thread

Content Outline

UNIT I- Java Programming

Servlets and Applets- Java Virtual Machine AWT controls, Event Handling , console programs and window (GUI) programs. Java Beans and Java Swing.

UNIT II Streams

Streams-Input Stream , IOException, Output Stream , Layering Streams, Streams, Reusability, and Testing, DataInputStream and DataOutputStream

UNIT III- Sockets

Sockets- Creating a Socket, protocols and Meta data, Server Sockets, Customizing Socket behavior, Special purpose Sockets, Direct Stream Manipulation, Subclassing Sockets, Special purpose Sockets, Secured Socket Layer (SSL), Socket Based Printer Server, Spooling

UNIT IV- Remote Method Invocation (RMI)

Remote Method Invocation (RMI) - Basic Structure of RMI, Serialization, Basic objects of RMI, Client Side Caching, Remote Interface, Common Object Request Broker Architecture (CORBA)

UNIT V - Threads

Threads- concept of multiple clients, basic terminology, Threading Concepts, Controlling Individual Threads, Coordinating Thread Activities, Cache Management, Assigning priorities to Threads, support for Threads in Java, Thread manipulation methods defined on Object, Threading and RMI, guidelines for Threading, Container Classes, Inter-thread Communication, Creation Thread

Reference Book :

1. JAVA RMI by William Grosso : O'REILLY publications Indian Reprint
by SHROFF publishers and Distributors Pvt. Ltd.
2. Java Network Programming by Elliotte Rusty Harold
3. Java Network Programming by Hughes Et Al

SUBJECT TITLE : ADVANCED MICROPROCESSORS
SUBJECT CODE : CT504/CM504
PERIODS/WEEK : 5
PERIODS/SEMESTER : 80

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	16 bit Microprocessors	14
II	ALP Concepts	15
	Test - I	2
III	Advanced Programming	15
IV	Computer Architecture	15
	Test - II	2
V	Advanced Architectures	15
	Test - III	2
	Total	80

OBJECTIVES

UNIT – I

1.1.0 Know about 16/32 Bit Microprocessors

- 1.1.1 State the limitations of a 8 bit microprocessors
- 1.1.2 State the need for 16/32 Microprocessors
- 1.1.3 State the need for compatibility

1.2.0 Understand the Architecture of 8086 Microprocessor

- 1.2.1 Draw the register structure diagram 8086 processor
- 1.2.2 State the need for group register
- 1.2.3 State the need for index register
- 1.2.4 State the need for segment register
- 1.2.5 Give the steps involved in computing the physical address
- 1.2.6 Draw the pin diagram g 8086
- 1.2.7 Draw the block diagram of a typical system bus architecture
- 1.2.8 Distinguish maximum and minimum mode of operation of 8086
- 1.2.9 Give the system bus timing
- 1.2.10 State the internal operations of CPU
- 1.2.11 Illustrate the different addressing modes in 8086
- 1.2.12 Illustrate the different instruction formats (1 to 6 bytes)
- 1.2.13 Compute the execution time for simple instructions
- 1.2.14 State the capability of 8088 and 8086

UNIT – II

2.1.0 Understand the Assembly level programming on 8086

- 2.1.1 Know the assembly instruction format
- 2.1.2 Explain State the different data transfer instructions
- 2.1.3 Explain the different arithmetic instructions
- 2.1.4 Explain the different loop instruction
- 2.1.5 Explain the different type data conversion instruction
- 2.1.6 Explain branch instructions
- 2.1.7 Explain shift and rotate instructions
- 2.1.8 Explain compare instructions
- 2.1.9 Understanding different type assemblers
- 2.1.10 State assembler directives and operatives
- 2.1.11 Understanding of DEBUG command

- 2.1.12 Understanding of BIOS interrupts
- 2.1.13 Understanding of DOS interrupts
- 2.1.14 Write simple assembler programs using above instructions
- 2.1.15 State the interrupt structure of 8086

UNIT III

3.1.0 Implementing advanced programs

- 3.1.1 Write Program for clear the screen
- 3.1.2 Write program to echo type character
- 3.1.3 Write program display all the characters
- 3.1.4 Write program for data transfer type
- 3.1.5 Write program for string processing type
- 3.1.6 Write program for converting a string to BOLD format
- 3.1.7 Write program for converting HEX to BCD conversion
- 3.1.8 Write program for String comparison
- 3.1.9 Write program for string reverse
- 3.1.10 Write program for solving problems like LCM, GCD
- 3.1.11 Write program for displaying system clock
- 3.1.12 Write program for drawing figures like triangle
- 3.1.13 Write program for file creation, file processing , etc
- 3.1.14 Write program for largest of an array
- 3.1.15 Write program for binary to gray
- 3.1.16 Write program for decimal multiplication
- 3.1.17 Write program for sorting decimal numbers
- 3.1.18 Write program for case conversion of string
- 3.1.19 Write program for password checking
- 3.1.20 Write program for check palindrome
- 3.1.21 Write program for string search
- 3.1.22 Write program for printing
- 3.1.23 Write program for generating random numbers
- 3.1.24 Write program for sum of arithmetic progression
- 3.1.25 Write program for positioning the cursor

UNIT IV

4.1.0 Understand the control unit and micro operations

- 4.1.1 Define instruction sequencing and instruction interpretation
- 4.1.2 Define micro instructions
- 4.1.3 Describe instruction execution sequencing
- 4.1.4 Explain about the different cycles (Fetch cycle, indirect cycle, interrupt cycle, execute cycle)
- 4.1.5 Explain briefly about hardwired implementation of control unit
- 4.1.6 Explain about control unit logic
- 4.1.7 Give the micro instruction format
- 4.1.8 Explain about micro programmed control unit
- 4.1.9 Explain the micro instructions sequence
- 4.1.10 Give details design, sequencing, and address generations
- 4.1.11 Explain briefly about micro instruction execution
- 4.1.12 Explain the taxonomy, encoding, and execution

4.2.0 Understand parallel

- 4.2.1 Define parallel processing
- 4.2.2 List the different types of parallel processing
- 4.2.3 Define bandwidth
- 4.2.4 Define flops
- 4.2.5 Explain about symmetric multi processors (SMP)
- 4.2.6 Explain about multi processing operating systems

- 4.2.7 Explain briefly about SISD, SIMD, MISD, MIMD organization processors
- 4.2.8 Explain briefly about the pipeline processor
- 4.2.9 Distinguish between instruction pipelining and arithmetic pipelining
- 4.2.10 Explain briefly about pipeline scheduling
- 4.2.11 Explain about clustering
- 4.2.12 Explain the benefits
- 4.2.13 Differentiate clusters and AMP

UNIT V

5.1.0 Advanced processors

- 5.1.1 Advanced processor. – 32 bit/64 bit processors
- 5.1.2 Concepts of RISC & CISC
- 5.1.3 Distinguish between RISC & CISC
- 5.1.4 Concepts of vector processing
- 5.1.5 Super Scalar Architecture
- 5.1.6 Advantages of Superscalar Architectures

5.2.0 Case study : Pentium processors

- 5.2.1 Draw and explain internal architecture of Pentium
- 5.2.2 Explain the functions of registers and flags
- 5.2.3 Describe Pentium bus structure
- 5.2.4 Classify instruction set
- 5.2.5 Discuss how interfacing is implemented using Pentium
- 5.2.6 State maximum interfacing capacity of Pentium
- 5.2.7 Discuss various Pentium chips and their architecture and features
- 5.2.8 Compare the capabilities of the above

5.3.0 Discuss various modern processors

- 5.3.1 Understanding the concepts of Hyper threading
- 5.3.2 Understanding multicore processors

CONTENT DETAILS

UNIT – I

Need for 16/32 bit microprocessors – Architecture of 8086 microprocessor – study of group register – index register, segment register – bus architecture – bus timings – addressing modes – instruction formats

UNIT – II

Instruction format – data transfer instructions – arithmetic instruction – loop instructions – flag instructions – shift and rotate instructions – assembler directives and operatives – Assembler directives, TASM & TLINK, DOS int routines, writing program – Interrupt structure of 8086

UNIT – III

Advance programming concepts in 8086. - Programs for : clear the screen, display all the characters, data transfer type, string processing type, string to BOLD format, HEX to BCD conversion, String proc, data conversion, LCM, GCD, system clock, Draw a triangle, file creation, file processing , etc

UNIT IV.

Computer Architecture, - Organization of Control unit., Micro instructions – Micro programs- Microprogrammed control unit-Parallel processing - SISD, SIMD, MISD, MIMD, pipe lining, m unit processor

UNIT V

Advanced processor : RISC, CISC, vector processor, Superscalar architecture

Case Study : Pentium processor –architecture, registers and instruction set. – interfacing

Modern processors – hyper threading- multicore processing

References :

1. Microprocessors – Bray
2. Microprocessors and Interfacing – Douglas V Hall
3. Assembly Language Programming – VenuGopal
4. Assembly Language Programming – Abel
5. Microprocessors & Microcontrollers – Thiagarajan (SCITECH)

SUBJECT TITLE	: SOFTWARE LAB – VI (DATA STRUCTURES)
SUBJECT CODE	: CT505
PERIODS PER WEEK	: 3
PERIODS PER SEMESTER	: 48

(Exercise minimum 20 experiments from the following)

1. Array operation using pointer arithmetic
2. Recursive functions to find factorial and Nth Fibonacci number
3. Sort array of structures – use selection sorting
4. Implement user defined functions to find string length, string reverse, string compare etc. And pattern matching
5. Implement insertion sort
6. Implement quick sort
7. Implement merge sort
8. Implement Bucket sort
9. Implement heap sort
10. Implement binary search and linear search
11. Implement stack using arrays
12. Implement stack using pointers
13. Implement queue
14. Implement circular queue
15. Implement double ended queue
16. Implement priority queue
17. Implement linked list
18. Implement circular linked list
19. Implement doubly linked list
20. Implement binary tree – (traversal inorder preorder , postorder)
21. Implement graph search – DFS, BFS
22. Implement Dijkstra algorithm

SUBJECT TITLE : SOFTWARE LAB – VII (Operating Systems)
SUBJECT CODE : CT506
PERIODS/WEEK : 3
PERIODS/SEMESTER : 48

LIST OF EXERCISES

1.
 - a) Display messages using 'echo' command
 - b) Identify the terminal with 'who' command
 - c) Getting help of various commends using 'man' command
 - d) Les the process status using 'ps' command
 - e) Assigning values for shell variables using 'set' command
2.
 - a) Adding an user to the system using system administration function
 - b) Removing an user from the system using system administration
 - c) Setting password for users
 - d) Searching files with find command
 - e) 'Shutdown' command
3.
 - a) Use 'sort' command for sorting text files
 - b) Know 'grep' command
 - c) Know 'sed' stream editor
 - d) Use 'cut' and 'paste' command
4.
 - e) Use editor 'vi' and its optima
 - f) Use 'ex' and its optima
 - g) Know script. Sh., emplash, exit
 - h) Use the 'ef' , 'then' 'else' statement
 - i) Use the 'care' statement
 - j) Use the 'expr' command
 - k) Use the 'while' statement
 - l) Use the 'for' command
5. Write a script or shell program that accepts one or more file name as arguments and converts them all to uppercase
6. Write a script that accepts a file name as argument and displays the last modification time if the file exists and a suitable message if it does not it
7. Installation and configuration of Linux
8. Installing and upgrading software packages
9. Creating users and groups
10. Perform Network configuration
11. Configure a) DNS b) Apache server c)FTP d) Samba server
12. Implement telnet service
13. Implement NIS & NFS services
14. Configure SMTP, POP3

SUBJECT TITLE : **SOFTWARE LAB – VIII**
(**VISUAL C++**)
SUBJECT CODE : **CT507**
PERIODS/WEEK : **3**
PERIODS PER SEMESTER : **48**

1. Write programs for demonstrating control structures
2. Write programs for implementing arrays
3. Implement recursive algorithms to find Nth fibonacci number and palindrome check of string
4. Implement object based applications
5. Implement inheritance for circle drawing
6. Implement exception handling using *finally* block
7. Implement exception handling in square root finding and integer division
8. Design program with password text box
9. Design applications with buttons, checkbox and picture box
10. Implement mouse and keyboard event handling
11. Implement menu driven applications
12. Design applications with Link label
13. Design applications with Checked list box
14. Design applications with combo box
15. Implement visual inheritance
16. Implement color setting of forms and fonts
17. Design animation of images
18. Design your own media player
19. Implement sequential file operations
20. Implement Database operations using SQL and ADO.NET

SUBJECT OF STUDY AND SCHEME OF EVALUATION

BRANCH: COMPUTER ENGINEERING

Semester 6

Code	Subject	Periods Per Week			Evaluation (Marks)			
		Theory	Practical/Tutorial	Total	Theory	Practical	Internal	Total
GE601	Industrial Management	5	1	6	75		25	100
CT602/ IF602	Software Engineering	5	1	6	75		25	100
CT603/ CM603/ IF603	Mobile Computing	5	0	5	75		25	100
CT604	Software Lab – IX (Web Technology)		6	6		75	25	100
CT605	Hardware Lab – III (ALP & CHM)		3	3		75	25	100
CT606	Software Lab – X (Network Programming)		3	3		75	25	100
CT607	Project		3	3		50	25	100
	Seminar		3	3			25	
	TOTAL	15	20		225	275	200	700

SUBJECT TITLE : INDUSTRIAL MANAGEMENT & ENTREPRENEURSHIP
SUBJECT CODE : GE 601 (COMMON TO ALL)
PERIODS/WEEK : 5+1
PERIODS/ SEMESTER : 80 + 16

TIME SCHEDULE

UNIT	TOPIC	PERIODS
I	1.1 Principles of Management	10
	1.2 Human Resource Management	5
II	2.1 Quality Planning and Control	5
	2.2 ISO-9000 & Installation	5
	2.3 TQM and Organizational Excellence	5
	Test – I	2
III	3.1 Project Management PERT / CPM	6
	3.2 Marketing & Sales	2
	3.3 Wages & Incentives	4
	3.4 Material Requirement Planning (MRP)	3
IV	4.2 Operations Research and Applications	10
	4.3 Management by Objectives (MBO)	3
	4.4 Management Information System (MIS)	2
	Test – II	2
V	5.1 Industrial Psychology	3
	5.2 Entrepreneurship Development	4
	5.3 Industrial Safety	4
	5.4 Environmental Pollution & Control	4
	Test – III	1
	Total	<hr style="border-top: 1px dashed black;"/> 80 <hr style="border-top: 3px double black;"/>

OBJECTIVES

UNIT – I

1.1.0 Understand the Principle of Management

- 1.1.1 Explain the meaning and concepts of management
- 1.1.2 Outline the characteristics of management
- 1.1.3 Illustrate the development of management theory
- 1.1.4 Illustrate the Taylor’s scientific management and contributions
- 1.1.5 Illustrate Henry Fayol’s principles of management
- 1.1.6 Compare the contributions of Taylor and Fayol
- 1.1.7 State the functions of management
- 1.1.8 Explain various administrative steps of each function
- 1.1.9 Describe different types of ownership
- 1.1.10 Explain different types of organization structure
- 1.1.11 Explain the concept of Leadership, Motivation & communication.

1.2.0 Appreciate the functions of Human Resource Management

- 1.2.1 Outline the importance of HRD
- 1.2.2 Explain the process of man power planning
- 1.2.3 Explain Job analysis, job evaluation, merit rating, performance appraisal
- 1.2.4 Training & Methods of Training

UNIT – II

2.1.0 Understand quality planning & control

- 2.1.1 Define quality
- 2.1.2 List the dimensions of quality
- 2.1.3 List the objectives of quality planning
- 2.1.4 Describe various quality control measures in brief
- 2.1.5 Explain quality assurance concept and definition
- 2.1.6 Describe in brief the Three Prong Approach to Quality Planning
- 2.1.7 Explain the need for quality management system
- 2.1.8 Draw quality loop

2.2.0 Understand the elements of ISO 9000, its Installation and audit

- 2.2.1 Describe the concept and role of ISO 9000
- 2.2.2 List the elements of ISO 9000
- 2.2.3 List the steps for installing quality system
- 2.2.4 Explain different ways of quality audit
- 2.2.5 Identify the agencies who give ISO certification
- 2.2.6 Discuss the role of accreditation board
- 2.2.7 Explain various stages of ISO 9000 implementation
- 2.2.8 Describe briefly the benefits of becoming an ISO 9000 company

2.3.0 Understand the concept of TQM and Organizational Excellence

- 2.3.1 Explain the concept of TQM
- 2.3.2 Outline the ten “Manthras” of TQM
- 2.3.3 Discuss in brief the link between ISO 9000 and TQM with the help of TQM model
- 2.3.4 Draw the organizational structure of TQM
- 2.3.5 Explain the different techniques of TQM
- 2.3.6 Discuss the concepts and characteristics of Quality Circle
- 2.3.7 Discuss the brain storming technique used in quality circle for arriving at solutions
- 2.3.8 Explain the organizational excellence by TQM approach and through “SWOT” analysis
- 2.3.9 Write mission statement

UNIT – III

3.1.0 Apply the principles of CPM & PERT

- 3.1.1 Outline the network technique
- 3.1.2 List different applications of CPM & PERT
- 3.1.3 Outline scope of PERT & CPM
- 3.1.4 Define the terms used in CPM & PERT
- 3.1.5 Explain the procedure for finding the critical path
- 3.1.6 Compute the project duration, slack and critical path by using AON & AOA
- 3.1.7 Distinguish between CPM & PERT
- 3.1.8 Define the terms used in PERT
- 3.1.9 Explain the procedure for PERT
- 3.1.10 Estimate activity time
- 3.1.11 Compute the project duration slack and mark the critical path
- 3.1.12 Solve the problems in PERT & CPM

3.2.0 Understand various steps in Marketing & Sales planning

- 3.2.1 Define marketing
- 3.2.2 List the objectives of marketing
- 3.2.3 Outline the core marketing concepts with the help of block diagrams
- 3.2.4 Discuss in brief the marketing mix, buying process and behaviour
- 3.2.5 Outline the importance of sales of products and services
- 3.2.6 List the functions of sales department
- 3.2.7 Explain the steps in market planning, market segmentation
- 3.2.8 Discuss the importance and functions of sales management
- 3.2.9 Discuss sales planning
- 3.2.10 Explain the market research and market information system

3.3.0 Understand the Principles of a good Wage Payment System

- 3.3.1 Outline the importance of a good wage plan
- 3.3.2 Define the different types of wages
- 3.3.3 List the requirements of a good wage plan
- 3.3.4 Define Incentives
- 3.3.5 Identify financial, non financial and semi financial incentives
- 3.3.6 Discuss different types of financial incentives plan
- 3.3.7 Compute the wages under different incentive plans with examples
- 3.3.8 Understand the concept of MRP
- 3.3.9 Understand the application of MRP

UNIT – IV

4.1.0 Understand various methods in Operations Research and its application

- 4.1.1 Outline the concept of optimization
- 4.1.2 Outline the scope of O.R
- 4.1.3 List the phases and processes of O.R
- 4.1.4 List the different methods of O.R.
- 4.1.5 Explain Linear programming graphical method & analytical method
- 4.1.6 Compute maximization of profit by linear programming - graphical method and analytical method (simple problems only)
- 4.1.7 Compute minimization of total cost by Linear programming - graphical method and analytical method (simple problems only)
- 4.1.8 Explain the transportation problem
- 4.1.9 Compute the initial feasible solution by north west corner rule and Vogel approximation method (simple problems only)
- 4.1.10 Explain the game theory
- 4.1.11 Compute the saddle point of the game two – person – zero sum using maximize and minimize principle (simple problems only)
- 4.1.12 Explain the queuing theory

- 4.1.13 List information required for formulating a mathematical model
- 4.2.0 Understand the concept of Management By Objective (MBO)**
 - 4.2.1 Outline the nature and purpose of MBO
 - 4.2.2 Identify sequential MBO processes
 - 4.2.3 List the merits and demerits of MBO
 - 4.2.4 List the steps required for MBO
 - 4.3.5 List the guidelines for setting objectives for MBO
- 4.3.0 Appreciate Management Information System (MIS)**
 - 4.3.1 Define MIS
 - 4.3.2 Distinguish between data and information, data processing & MIS
 - 4.3.3 State the need for information
 - 4.3.4 Discuss the systems concept of management
 - 4.3.5 Discuss a firm and its environment
 - 4.3.6 List the objectives and inputs of an effective MIS
 - 4.3.7 Explain the integrated MIS
 - 4.3.8 List major functional and activity subsystems in MIS
 - 4.3.9 Describe MIS development (system development) with the help of a line diagram
 - 4.4.10 List applications of MIS

UNIT – V

- 5.1.0 Justify the concept of Industrial Psychology**
 - 5.1.1 Describe the meaning of Industrial Psychology
 - 5.1.2 Outline the importance of good working conditions and environment
 - 5.1.3 Explain the concept of Behavioural dynamics
 - 5.1.4 Distinguish the interpersonal behaviour and interpersonal needs
 - 5.1.5 Discuss the development of interpersonal relationship
 - 5.1.6 Describe the development of better qualities (personality traits)
- 5.2.0 Formulate the feasible project report to start a small scale industry**
 - 5.2.1 Explain the concept of entrepreneurship
 - 5.2.2 Describe the profile of an entrepreneur
 - 5.2.3 List the functions of an entrepreneur
 - 5.2.4 List the risk taking qualities of an entrepreneur
 - 5.2.5 Explain the concept of entrepreneurial development
 - 5.2.6 List the different factors contributing to the failure of entrepreneurial ventures
 - 5.2.7 Identify industrial support needed programs existing in India
 - 5.2.8 State the concept of small scale and ancillary industrial undertaking
 - 5.2.9 List the steps involved in starting small-scale industry
 - 5.2.10 Describe the procedure of registration of SSI
 - 5.2.11 Identify the net work of financial assistances given to SSI
 - 5.2.12 Identify the different constituents of feasibility study
 - 5.2.13 Prepare the feasibility report / project report
- 5.3.0 Recognize the features of Industrial Safety**
 - 5.3.1 Explain the importance and need for safety measures in industries
 - 5.3.2 Define the meaning of the term – factory, accident, frequency rate, security rate, accident pronnes, unsafe acts, unsafe conditions, job safety analysis, plant safety inspections
 - 5.3.3 Identify the various accident factors, mechanical factors, environmental factors, personal factors
 - 5.3.4 Discuss the 4 E's of accident prevention technique
 - 5.3.5 List the precautions to be observed while working in an hazardous environment
 - 5.3.6 Explain briefly the artificial respiration methods
- 5.4.0 Recognize the causes of environmental pollution and steps to be taken to control the pollution**
 - 5.4.1 Define the terms Ecology and Ecosystem
 - 5.4.2 Explain the impact of industrial development on environment

- 5.4.3 Explain the causes and effects of air and water pollution on plant, animal life and materials
- 5.4.4 Identify the characteristics of industrial and municipal waste
- 5.4.5 Outline the various treatment processes
- 5.4.6 Identify the sources of air pollutants
- 5.4.7 State the effects of air pollution
- 5.4.8 Outline the methods of prevention and control of air pollution
- 5.4.9 Explain the term solid waste management
- 5.4.10 List the salient features of environmental pollution control legislation
- 5.4.11 State the functions of pollution control board
- 5.4.12 Define NOISE
- 5.4.13 Identify the causes of noise pollution
- 5.4.14 Explain the various methods of noise control

CONTENT DETAILS

UNIT – 1

Principles of management

Introduction – meaning of management: - Management as an art of getting things done, management as a process, management as an activity

Management and administration – Development of management theory: - Taylor’s scientific management, contributions of F.W. Taylor, Henry Fayols principles of management (Brief description), compare F.W. Taylor & Henry Fayol’s contributions

Functions of management: -

Planning: - concept, steps in planning

Organizing: - concept and process steps, steps in organizing

Staffing: - concept, list functions of staffing

Directing: - concept, list the elements of directing

Controlling: - Concept, list the steps in controlling process

Decision making: - concept, steps in decision making, scientific approach to decision making

Different types of ownership: - Sole proprietorship, partnership, private Ltd., company, public Ltd., company, co-operative society (brief description only)

Organizational structure: - Definition of organization, different types of organizational structure: - line, functional, line & staff organization (brief description with advantages & disadvantages)

Leadership - Define leadership, different types of leadership, qualities of a good leader

Motivation - characteristic of motivation, importance, Marlow s need hierarchy theory,

Techniques of motivation

Communication_– Types of communication, Barriers in communication.

Human Resource Management

Concept of HR Management – Development of HR Management – Components of HRD – Job analysis – Job description – Job specification

Manpower planning – Requirements of manpower planning – Factors affecting the manpower planning – Job evaluation – Steps required for job evaluation – Methods for job evaluation – Merit rating – objectives and methods – performance appraisal.

Training – Importance of training – Methods of training – advantages of training (Brief description only)

UNIT - II

Quality Planning and Control

Definitions of quality, Requirements of quality, list objectives of quality planning – quality control: - operator's quality control, inspectors quality control, Managers quality control, total quality control.

Quality Assurance: - Concept, definition, responsibility of quality assurance department, planning for quality assurance – three prong approach to quality planning: - (1) Product planning (2) Managerial & Operational planning (3) Documentation. Quality management system, quality loop.

ISO 9000 & Installation

Concept and role of ISO 9000, what is ISO 9000, whom does it help, elements of ISO 9000, steps for installation of quality system - preparatory step, implementation step, registration & certification step. Quality Audit - objectives, types off audits: - Adequacy audit, compliance audit, system audit, product audit, first party audit, second party audit, third party audit. Steps required to apply for ISO – 9000 Registration. Benefits of becoming an ISO 9000 company.

Understand the concept of TQM and Organizational Excellence

Concept, ten mantras of TQM, the link between ISO 9000 and TQM with the help of TQM Model – organization of TQM. Techniques of TQM - PDCA, Total Employee Involvement (TEI), POKA – YOKA – Failure proofing, JIT manufacturing.

Quality Circles - concept, characteristics, Brain storming method for solving Q.C. Problems. Organizational excellence through TQM - List the strength, weakness, opportunity and threat (SWOT analysis) of an organization by an example and analyse the current status – mission statement.

UNIT – III

Management Techniques – CPM & PERT

Introduction to Network analysis, application of CPM & PERT, scope of CPM & PERT commonly used terms in CPM: - Operation, pre-operation, post operation, concurrent operation, earliest finish time EFT), latest finish time (LFT), Critical activities, critical path, EVENT, SLACK or FLOAT, Dummy activity, - procedure for CPM, problems on CPM, projects duration, slack, mark critical path (by AOA and AON method).

PERT - comparison between CPM & PERT, procedure for PERT, Estimation of activity time, commonly used terms in PERT, Event, Activity, successor Event, Predecessor event, Earliest Expected Time, Latest allowable time, slack – problems in PERT.

Marketing & Sales

Marketing - introduction, definitions, objectives, core concepts: - block diagram, distinguish between marketing and sales, marketing MIX. Buying process & behaviour of consumer, steps in market planning – market segmentation

Sales - importance of sales, functions of sales management, market research, market information system.

Forecasting related to marketing and sales

The Principles of a good wage payment system

Importance of good wage plan, types of wages - nominal, real, living, fair, minimum wages – requirement of a good wage payment system.

Incentives - definitions, types of incentive plan for direct workers - non financial and semi financial incentives – financial incentive plans - straight piece rate system, straight piece rate with guaranteed minimum wage, differential piece rate system, Halsey plan, Rowan plan, Gantt (simple illustrative problems)

Material requirement planning (MRP)

MRP objectives & functions – Terminology – MRP systems – MRP outputs – Management information from MRP – Lot sizing considerations – Examples – applications – introduction to MRP – II - Just in time (JIT). (Brief description only)

UNIT – IV

Operations Research & Application

Concepts of OR, scope of OR, phases and process of OR, methods of OR -

Linear programming: - a) graphical & analytical method b) transportation method: - North west corner rule, Vogel approximation method

Waiting line or Queuing theory

Game theory

Linear programming: - concepts, formulation of LPP, Do problems on maximization of profit, minimum of total cost (by graphical & analytical method)

Transportation problem: - meaning, compute the initial feasible solution by northwest corner rule & Vogel approximation method (simple problems)

Game theory: - concept, two-persons zero sum game, the maxi-min- mini-max principle –optimal strategy, saddle point, example problems to compute saddle point – waiting line or queuing theory - concept, the information required for formulating a mathematical model (simple problems)

Management by objectives (MBO)

Concepts & definition, contents of MBO, sequence of MBO process with block diagram, steps required for MBO, guidelines for setting objectives

Management Information Systems (MIS)

Definition of MIS, Data, Information, management, systems concepts of management, a firm and its environment, objectives, contents of MIS, need for information, integrated MIS, functional and activity subsystems, MIS development - line diagram, application of MIS - inventory management, Human resource management, personal decision making.

UNIT – V

Industrial Psychology

Meaning, importance of good working conditions and environment: - physical working conditions, psychological working conditions, working conditions related to time, related to social situation.

Behavioural dynamics: - self concept and self understanding, inter personal needs, developing interpersonal relationship: - framing first impression, developing mutual expectations, honouring psychological contracts, developing trust & influence, projecting positive qualities and hiding negative points – developing better behaviour and qualities a TQM approach: - conducting ‘SWOT’

analysis for self understanding, prepare incremental projects to reduce weakness and threats - mission statement

Small Scale Industries – Entrepreneur

List steps required to start small scale industry, procedure for registration (provisional and permanent registration) – sources of financial assistance, govt., assistance for development of SSI, preparation of project report, Tax: - an overview of income tax – excise duty, sales tax – procedure to be followed for sales tax

Industrial Safety

Define Accident, Frequency rate, severity rate, and accident proneness.

List the causes of accidents: - Mechanical, Environmental, personnel factors accident prevention techniques – 4 E’S of Accident prevention technique

Environmental Pollution and control

Ecology and Eco system

Impact of industrial development on environment

Causes and effects of air and water pollution on plant, animal life and material

Characteristics of industrial and municipal waste

Treatment processes:- Primary, secondary and tertiary

Sources of air pollutants on human beings

Effects of air pollutants on human beings
Prevention and control of air pollution
Solid waste management
Environment pollution control legislation and functions of pollution control boards
Causes of noise pollution and its control

Special Instruction to Question Setters

1. All units should be given equal weightage of marks
2. Problems from wage plan, CPM-PERT, and O.R should be included in every question paper in order to measure the application capability of students

REFERENCE BOOKS

1. Industrial Engineering & production management – Martand.T.Telsang
S.chand & Company
2. Industrial Engineering & Management - O. P. Khanna
3. Operations Research - Premkumar Guptha, D.S. Hira
4. TQM - Productivity Council
5. ISO - Tapan.P.Bagachi
6. Entrepreneurship Development - Jagmer Singh Saihi
7. Industrial Management & Engineering Economics - Banga & Sharma
8. TQM - B. Senthil Arasu & J.Praveen Paul Scittech Publications
9. Human resources management Mirza and saiyadam (Tata Magrhill publishers.)

SUBJECT TITLE : SOFTWARE ENGINEERING
SUBJECT CODE : CT 602/ IF 602
PERIODS/WEEK : 6
PERIODS/SEMESTER : 96

TIME SCHEDULE

<u>UNIT</u>	<u>TOPIC</u>	<u>PERIODS</u>
I	1.1 Software engineering concepts	8
	1.2 Project management	10
	Test - I	2
II	2.1 Requirement analysis	8
	2.2 Software Design	10
	Test - II	2
III	3.1 User interface Design	8
	3.2 Coding, testing	10
	Test - III	2
IV	4.1 Software reliability	6
	4.2 Quality assurance	6
	4.3 CASE	6
	Test - IV	2
V	5.1 Advanced topics in software engineering	16
	Test - V	2
	Total	96

OBJECTIVES

UNIT – I

1.1.0 Introduction to software engineering

- 1.1.1 Explain the relevance of software engineering
- 1.1.2 State the software characteristics and applications
- 1.1.3 Explain the emergence of software engineering.
- 1.1.4 Briefly explain early computer programming, high level language programming
- 1.1.5 List various software design paradigms
- 1.1.6 Discuss control flow based design
- 1.1.7 Discuss data flow oriented design
- 1.1.8 Discuss data structure oriented design
- 1.1.9 Discuss object and component based design
- 1.1.10 State the software life cycle models
- 1.1.11 Explain classical water fall and iterative water fall models
- 1.1.12 Explain prototyping
- 1.1.13 Explain evolutionary model
- 1.1.14 Explain spiral model

1.2.0 Understand project management

- 1.2.1 State the project management concepts people, product, process and project
- 1.2.2 Briefly explain the term project management
- 1.2.3 Explain the project size estimation metrics, line of control (LOC) and function point metric (FP)
- 1.2.4 Compare the project estimation techniques, empirical estimation techniques, heuristic techniques and analytical estimation techniques
- 1.2.5 Briefly explain the three COCOMO models, Basic, Intermediate and complete
- 1.2.6 State the effect of schedule change on lost
- 1.2.7 State the Jensen model for stating level estimation
- 1.2.8 State the tools for scheduling
- 1.2.9 Explain briefly the use of work breakdown structure, activity networks, Gantt chart and PERT in scheduling
- 1.2.10 Explain briefly organization structure
- 1.2.11 Explain briefly team structure
- 1.2.12 Discuss the Importance of risk identification, risk assessment and risk containment with reference to risk management

UNIT – II

2.1.0 Understanding the need of requirement Analysis

- 2.1.1 Explain the need for requirement analysis
- 2.1.2 Briefly explain the steps in requirement dictation for software- initiating the process facilitated application specific techniques and quality function deployment
- 2.1.3 List the principles of analysis
- 2.1.4 Briefly explain software prototyping
- 2.1.5 State the prototyping approach
- 2.1.6 State the prototyping tools and methods
- 2.1.7 State the software requirement specification principle
- 2.1.8 Define Software Requirement specification (SRS) document
- 2.1.9 Briefly explain the characteristics and organization of SRS document

2.2.0 Understanding the principles and methods of software design

- 2.2.1 State the importance of software design
- 2.2.2 State the design principles and concepts
- 2.2.3 Define cohesion and coupling
- 2.2.4 State the classification of cohesiveness
- 2.2.5 State the classification of coupling
- 2.2.6 Compare the software design approaches
- 2.2.7 Briefly explain structured analysis methodology
- 2.2.8 State the use of Data Flow Diagrams(DFD)
- 2.2.9 List the symbols used in DFD
- 2.2.10 Explain the construction of DFD
- 2.2.11 State the limitations of DFD
- 2.2.12 State the uses of structure of chart and structured design
- 2.2.13 State the principles of transformation of DFD to structure chart
- 2.2.14 Define the transform analysis and transaction analysis
- 2.2.15 Review of object oriented concepts
- 2.2.16 Compare the object oriented and function oriented design
- 2.2.17 Briefly explain the object oriented design methodology object identification Booch's method

UNIT – III

3.1.0 Understanding the principles of User Interface Design(UID)

- 3.1.1 Briefly explain the rules for UID
- 3.1.2 Briefly explain the interface design models
- 3.1.3 State the UID Process and models
- 3.1.4 Briefly explain the interface design activities defining interface objects, actions and the design issues
- 3.1.5 Compare the various types of interfaces
- 3.1.6 Briefly explain the main aspects of Graphical User Interface, Text based interface

3.2.0 Understanding the principles of Software coding

- 3.2.1 Define coding standards and guidelines
- 3.2.2 Briefly explain code walk through
- 3.2.3 Briefly explain code inspections and software documentation
- 3.2.4 Briefly explain unit testing, integration testing and system testing
- 3.2.5 Explain unit testing
- 3.2.6 Methods of black box testing
- 3.2.7 State the equivalence class partitioning and boundary value analysis
- 3.2.8 State the methodologies for white box testing
- 3.2.9 Briefly explain the different white box methodologies - statement coverage, branch coverage, condition coverage, path coverage, data flow based testing and mutation testing
- 3.2.10 State the debugging approaches –Brute force, Backtracking, Cause Elimination
- 3.2.11 Compare the program analysis tools - static and dynamic analysis tools
- 3.2.12 State the need for integration testing
- 3.2.13 Compare phased and incremental integration testing
- 3.2.14 Explain the system testing alpha, beta and acceptance testing
- 3.2.15 State the need for stress testing and error seeding
- 3.2.16 State the general issues associated with testing

UNIT – IV

4.1.0 Understanding the importance of software reliability

- 4.1.1 Briefly explain the importance of Software reliability
- 4.1.2 Explain the different reliability metrics – PFOD, ROCOF, MTTF, AVAIL
- 4.1.3 State the reliability growth modeling
- 4.1.4 Explain the characteristics of quality software
- 4.1.5 Explain the evolution of software quality management system
- 4.1.6 Explain the importance, requirement and procedure to gain ISO 9000 certification for software industry
- 4.1.7 State the SEI capability maturity model
- 4.1.8 Compare between ISO 9000 certification
- 4.2.0 Understanding the computer aided software engineering
- 4.2.1 Briefly explain CASE
- 4.2.2 Discuss the benefits of CASE
- 4.2.3 Briefly explain the building blocks for CASE
- 4.2.4 CASE support in software life cycle
- 4.2.5 List the different CASE tools.

UNIT – V

5.1.0 Advanced topics in software engineering

- 5.1.1 Briefly explain the Component Based Software Engineering (CBSE)
- 5.1.2 Describe the structure of Client Server (C/S) systems
- 5.1.3 State the Software components for Client Server systems
- 5.1.4 State the distribution of Software component

- 5.1.5 List the guidelines for distributing application sub systems
- 5.1.6 Give the steps in linking Client Server software sub systems
- 5.1.7 Explain middle wave and object request broker Architecture.
- 5.1.8 Briefly explain the attributes of web based application – quality attributes and technologies
- 5.1.9 Explain the design of web-based applications.
- 5.1.10 Briefly explain the architectural design, navigation design interface design

CONTENT DETAILS

UNIT - I

Introduction to Software Engineering (SE), software (S/W) characteristics and applications, emergence of SE, S/W life cycle models

Project management concepts, project size estimation metrics, project estimation techniques, project scheduling, tools project estimation techniques, project scheduling, tools for scheduling, organizational structure, risk management

UNIT - II

Need for requirement analysis requirement elicitation, principles prototyping – tools and methods, requirement specification principles – SRS document

S/W design, principles and concepts, cohesion and coupling S/W design approaches, data flow diagrams, structure chart and structured design transform analysis and transaction analysis, object oriented concepts, object oriented and function oriented design object oriented methodology

UNIT - III

Importance of user interface design, design models, rules interface design activities various types of interfaces, graphical user interface text based interfaces s/W coding standards code walk through code inspection and s/W documentation.

S/W testing, unit testing, Block box testing, white box testing, debugging, program analysis tools integration testing, systems testing, general issues in testing

UNIT - IV

S/W Reliability, Reliability metrics, growth models S/W quality, Quality management system, ISO certification in S/W industry, SEI CMM

Computer aided software engineering (CASE), building blocks, CASE support in S/W life cycle, CASE tools

UNIT - V

Component based s/W engineering, client server systems, structure, S/W components, distributing application subsystem, linking middle ware, object request broker architecture, Web engineering, Attributes, design of web based applications.

REFERENCE BOOKS

1. Fundamentals of software engineering - Rajib Mall
2. Software engineering a practitioners approach - Roger S. Pressman
3. Software engineering - Shajan Mathew

SUBJECT TITLE : MOBILE COMPUTING
SUBJECT CODE : CT 603 /IF 603 /CM 603
PERIODS/WEEK : 5
PERIODS/SEMESTER : 80

<u>UNIT</u>	<u>TOPIC</u>	<u>TIME SCHEDULE</u>	<u>PERIODS</u>
I	Introduction and TCP/IP		14
II	MAC and Telecommunication Systems	15	
		Test - 1	2
III	Satellite and Broadcast Systems		15
IV	Wireless LAN and PAN		15
		Test - 2	2
V	Mobile TCP/IP		15
		Test - 3	2
		Total	80

OBJECTIVES

UNIT – 1

Objectives

UNIT - I

- 1** **Introduction to Mobile Computing**
 - 1.1 Discuss the Applications of mobile computing
 - 1.2 Discuss History of wireless communication
 - 1.3 Study a simplified reference model
 - 1.4 Explain Cellular systems
 - 2**
 - 2.1 Understand Protocols and the TCP/IP suite
 - 2.2 State the need for a protocol architecture
 - 2.3 Explain the TCP/IP protocol architecture
 - 2.4 Explain Internetworking
 - 2.5 Study of Internet protocols
 - 2.6 Study of Transmission control protocol
 - 2.7 Explain user datagram protocol
 - 3**
 - 3.1 Understand Medium access control
 - 3.2 Discuss the motivation for specialized MAC
 - 3.3 Study Hidden & exposed terminals, Near & far terminals
 - 3.4 Study of SDMA
 - 3.5 Study of FDMA
- UNIT - II**
- 3.4 Study of TDMA
 - 3.5 Study of CDMA
 - 3.6 Comparison of S/T/F/CDMA
 - 4 Understanding Telecommunication systems

	4.1	Explain GSM
	4.1.1	Study Mobile services
	4.1.2	Explain the System architecture
	4.1.3	Study of Radio interface
	4.1.4	Know the Protocols
	4.1.5	Explain Localization & calling
	4.1.6	Explain Handover
	4.1.7	Discuss Security
	4.1.8	Explain New data services
UNIT - III		
	5	Understand Satellite Systems
	5.1	List the Applications of satellite systems
	5.2	Know the Basics of satellite systems
	5.2.1	Study of GEO 139
	5.2.2	Study of LEO 139
	5.2.3	Study of MEO 140
	5.3	Explain Routing
	5.4	Explain Localization
	5.5	Explain Handover
	6	Understand Broadcast systems
	6.1	Overview of Broadcast systems
	6.2	Explain Cyclic repetition of data
	6.3	Study of Digital audio broadcasting
	6.3.1	Explain Multimedia object transport protocol
	6.4	Study Digital video broadcasting
UNIT - IV		
	7	Understand Wireless LAN
	7.1	Compare Infrared and radio transmission
	7.2	Study the Infrastructure & adhoc network
	7.3	Study IEEE802.11 standard
	7.3.1	Explain System architecture
	7.3.2	Explain Protocol architecture
	7.3.3	Study the Physical layer
	7.3.4	Study Medium access control layer
	7.3.5	Discuss Mac management
	7.3.6	Discuss Future development
	7.4	Know Bluetooth Technology
	7.4.1	List the Bluetooth applications
	7.4.2	Discuss Bluetooth standards documents
	7.4.3	Study Protocol architecture
	7.4.4	Discuss Usage models
	7.4.5	Discuss Piconets & Scatternets
	7.4.6	Explain Radio specification
	7.4.7	Explain Baseband specification
	7.4.8	Study Frequency hopping
	7.4.9	Study Physical links
	7.4.10	Explain Packets(outline)
	7.4.11	Study Error Correction
	7.4.12	Explain Logical channels
	7.4.13	Study Channel control
	7.4.14	Explain Bluetooth Audio(outline)
	7.4.15	Discuss Bluetooth Security
	7.4.16	Outline Link manager specification
	7.4.17	Outline logical link control and adaptation protocol

	7.4.18	Study L2CAP Channels
	7.4.19	Study L2CAP packets
	7.4.20	Discuss Signaling commands
	7.4.21	Discuss Quality of service
UNIT - V		
8		Understand Mobile network layer
	8.1	Know the Mobile IP
	8.1.1	Discuss Goals, assumptions & requirements
	8.1.2	Explain Entities & terminology
	8.1.3	Describe IP packet delivery
	8.1.4	Discuss Agent advertisement & discovery
	8.1.5	Study Registration
	8.1.6	Study Tunneling & encapsulation
	8.1.7	Study Optimizations
	8.1.8	Study Reverse tunneling
	8.1.9	Study IPv6
	8.2	Know Dynamic host configuration protocol
9		Understand Mobile transport layer
	9.1	Study Traditional TCP
	9.1.1	Explain Congestion control
	9.1.2	Explain Slow start
	9.1.3	Explain Fast retransmit & fast recovery
	9.1.4	Explain Implication on mobility
	9.2	Study Indirect TCP
	9.3	Study Snooping TCP
	9.4	Study Mobile TCP
	9.5	Discuss Fast retransmit & fast recovery
	9.6	Study Transmission/time out freezing
	9.7	Explain Selective retransmission
	9.8	Study Transaction oriented TCP

CONTENT OUTLINE

UNIT – I

Introduction to mobile computing- application-history, reference model, cellular systems – Protocol , TCP/IP protocol, Internetworking, Internet protocols, TCP, User Datagram Protocol,- MAC, Hidden & Exposed terminals, Near and Far terminals, SDMA, FDMA

UNIT II

TDMA, CDMA, - Telecommunication Systems, - GSM, mobile services, architecture, radio interface, protocols, localization, handover, security

UNIT III

Satellite Systems- Applications, GEO 139, LEO 139, MEO 140, - Routing- Localization, Handover,- Broadcast systems, cyclic repetition, digital audio and video broadcasting

UNIT IV

Wireless LAN- infrared/radio transmission, IEEE 802.11 – architecture, system and protocol , physical layer, MAC layer- Blue Tooth – applications, standard, usage models, Piconets, Scatternets, Radio specification, Baseband application, Frequency Hopping, Physical Links- Packets, Error correction, channel control , Bluetooth audio, security, Link manager specification, LLC, L@CAP Channels and packets, Signaling Commands

UNIT V

Mobile network Layer- Mobile IP- Entities and Terminology, IP Packet delivery, Agent advertisement and discovery- Registration, Tunneling and Encapsulation, Optimisation , Reverse Tunneling, IPv6- Dynamic host configuration protocol, - Mobile Transport Protocol- Congestion control- Slow start, Fast retransmit & fast recovery- Indirect TCP, Snooping TCP, Mobile TCP, Selective re-transmission, Transaction oriented TCP

REFERENCE BOOKS

1. Wireless communications & networks - William Stallings, PHI
2. Mobile communications - Jochen Schiller, Pearson Publishers

REFERENCE WEB SITES

1. www.palowireless.com
2. www.java.sun.com

SUBJECT TITLE : **SOFTWARE LAB- IX (WEB TECHNOLOGY)**
SUBJECT CODE : **CT604**
PERIODS/WEEK : **6**
PERIODS/SEMESTER : **96**

OBJECTIVES

- 1) Familiarize different browsers
- 2) Create email id, compose, send, receive emails
- 3) Familiarize with various Search Engines
- 4) Familiarize with web portals, e-commerce sites, etc.
- 5) Install and configure Server Software: IIS, Apache, Java Web server
- 6) Develop HTML documents using HTML tags
- 7) Implement text formatting tags, list tags
- 8) Implement table tags, hyper links
- 9) Develop HTML documents with img tags
- 10) Implement frames
- 11) Implement form control tags
- 12) Implement JavaScript functions (client side scripting)
- 13) Implement string manipulations
- 14) Implement form validation (submission, retrieval of data, etc.)
- 15) Develop simple PHP scripts
- 16) Implement Functions in PHP
- 17) Implement control statements in PHP
- 18) Implement array handling in PHP
- 19) Implement string, date, and time manipulation functions of PHP
- 20) Implement form validation in PHP
- 21) Implement file handling in PHP
- 22) Implement MySQL database connectivity using PHP
- 23) Develop web pages using database support: data retrieval, data storage, data sorting, searching etc.
- 24) Familiarize with web page development tools: Front page, Flash, Dream weaver, Photoshop.
- 25) Design and Develop an e-commerce web site
- 26) Design and Develop an e-greetings Web site
- 27) Design and Develop an e-context web site
- 28) Familiarize with search engine submission.

SUBJECT TITLE : **Hardware Lab-III (ALP & CHM)**
SUBJECT CODE : **CT605**
PERIODS/WEEK : **6**
PERIODS/SEMESTER : **48**

OBJECTIVES

ALP Lab

- 1) Write Program for clear the screen
- 2) Write program to echo type character
- 3) Write program display all the characters
- 4) Write program for data transfer type
- 5) Write program for string processing type
- 6) Write program for converting a string to BOLD format
- 7) Write program for converting HEX to BCD conversion
- 8) Write program for String comparison
- 9) Write program for string reverse
- 10) Write program for solving problems like LCM, GCD
- 11) Write program for displaying system clock
- 12) Write program for drawing figures like triangle
- 13) Write program for file creation, file processing , etc
- 14) Write program for largest of an array
- 15) Write program for binary to gray
- 16) Write program for decimal multiplication
- 17) Write program for sorting decimal numbers
- 18) Write program for case conversion of string
- 19) Write program for password checking
- 20) Write program for check palindrome
- 21) Write program for string search
- 22) Write program for printing
- 23) Write program for generating random numbers
- 24) Write program for sum of arithmetic progression
- 25) Write program for positioning the cursor

CHM Lab

1. Demonstration of mother board – identification of processor sockets and CPU support, memory module support, power connector, keyboard connector, BIOS, bus slots, chipset, cache memory, co-processors, CMOS battery, CMOS chipset etc
2. Demonstration of SMPS – connector identification – measurement of voltages in various connectors – plugging the connector in motherboards and devices like HDDs, FDDs, CD-ROMs, CTDs etc – various power supply problems.
3. Demonstration of display adapters – identification of various adapters – demonstration of monitor – identification of various monitors
4. Demonstration of keyboards – identifying various types of keyboards
5. Demonstration of various FDCs and FDDs – identifying major assemblies on a drive – connecting practice
6. Demonstration of HDDs – identifying the HDDs with different interfacing – connecting details – master slave connection
7. Demonstrating the system assembly – CPU – cooler fan, SMPs – memory – display adapter – monitor – keyboard – FDC and FDD – HDD
8. Demonstrating the errors during the POST – configuring the peripherals in CMOS RAM – Booting from FDD – bootable disk preparation – preparation of HDD (LLF - partitioning – HLF)
9. Demonstration of fixing the parts in the cabinet - connecting front panel connections
10. Demonstration of CONFIG.SYS and AUTOEXEC.BAT with various parameters
11. Demonstration of various with serial – parallel – PS-2 interfaces – USB ports
12. Demonstration of CDs – Drives – Drive installation procedure – CD writer installation and writing practice
13. Installation windows and Linux operating system from CDs and HDDs – installation of drivers of display
14. Demonstration of modern identification – installation procedures
15. Demonstration of DMPs – inkjet printers – installation under DOS and WINDOWS platforms – Head/cartridge assembly procedures – various troubles with printers
16. Demonstration of scanner – installation and connection procedures

Trouble Shooting

1. Various troubles and rectification procedures of motherboard – CPU – memory modules – display adapters – monitors – SMPS – keyboards – FDC, FDDs, HDC, HDD – CMOS setup – CDROM driver – sound cards – DMP – inkjet printer – scanners – modern - mouse
2. OS related problems (DOS, WINDOWS 98, LINUX)
3. Other software installation procedures
4. Virus problem and solution – Antivirus software

Networking

1. Demonstration of networking – novel Netware / Windows NT – cabling practice – server / client techniques – network administration – uses management – printer connection – basic troubleshooting on networks
2. Internet
3. E-mail etc

**SUBJECT TITLE : SOFTWARE LAB –X
(NETWORK PROGRAMMING)**
SUBJECT CODE : CT606
HOURS/WEEK : 3
HOURS/SEMESTER : 48

Objectives

1. Revise Java Programming concepts
2. Revise Sample programs using Packages
3. Revise Sample programs using Interface
4. Revise Sample programs with Exception handling
5. Revise Sample programs for input and output
6. Simple programs using threads
7. Implement various Thread functions using Thread class
8. Implement thread using Runnable Interface
9. Implement Multithreading
10. Implement Inter-thread communication
11. Revise Interactive programming using Applets(minimum 3 nos.)
12. Client-Server programs using Applets and Servlets
13. find out the current IP address of the machine
14. display a particular web page from an applet
15. Viewing a File
16. Compressing a File
17. Implement socket(minimum 3 nos)
18. Implement Server Sockets
19. Implement RMI
20. Net Chat

Text Book : JAVA RMI by William Grosso : O'REILLY publications Indian Reprint
by SHROFF publishers and Distributors Pvt. Ltd.

Ref Book : Java Network Programming by Elliotte Rusty Harold
Java Network Programming by Hughes Et Al

Ref. Website: http://www.davidreilly.com/java/java_network_programming/

SUBJECT TITLE	: PROJECT WORK AND SEMINAR
SUBJECT CODE	: CT607
PERIODS/WEEK	:
Seminar	: 3
Project	: 3
PERIODS/SEMESTER	: 96

1. Seminar topic must be selected based on the current trends in the computer field. Primary intention of seminar is to develop communication skill of the student. Marks will be awarded depending on the presentation, subject and the report.
2. Report must be submitted prior to the presentation.
3. Hardware / Software project must be related to the current demand in the industry. Marks will be awarded by an interim evaluation in the middle and at the end of the project. Report may contain the following:
 - a) Detailed system study
 - b) Data Flow Diagram/System flowchart/Circuit diagram
 - c) Program flowchart / PCB / Layout drawing
 - d) Source code for the important modules / Maintenance schedules
 - e) Output screen formats/explanation of working of the system / Testing formats.

List of Faculty who made Contributions to the Curriculum Revision 2006

Sl. No	Name	Designation
1	Shri. Balu John	Asst. Professor in IT, Govt. Engineering College, Barton Hill
2	Sri. Philip Kurian	Asst. Professor&Head in Charge, NITTTR Extn Centre, Kalamassery
3	Sri. Kulanthaivel	Lecturer, NITTTR, Chennai.
4	Smt. Malligai	Lecturer, NITTTR, Chennai.
5	Smt. Bindu P.S.	Head of Section in Computer Engg
6	Sri. Saji T	Head of Section in Computer Engg
7	Sri. Suresh Kumar C.P	Head of Section in Computer Engg
8	Sri. Solomon P.Y	Head of Section in Computer Engg
9	Smt. Beena S.	Head of Section in Computer Engg
10	Shri. Manoj P.S	Technical Officer, O/o JCTE
11	Sri. Abdul Nasser Kaipancherry	Lecturer in Computer Engg
12	Sri. Pradeep Kumar	Lecturer in Computer Engg
13	Smt. Bindu Vinod	Lecturer in Computer Engg
14	Sri. Biju M.J	Lecturer in Computer Engg
15	Sri. Roy Thomas	Lecturer in Computer Engg
16	Sri. Pramod Chathampalli	Lecturer in Computer Engg
17	Sri. Subin Paul	Lecturer in Computer Engg