

# **INFORMATION TECHNOLOGY**

Shri Vile Parle Kelavani Mandal's

## **Shri Bhagubhai Mafatlal Polytechnic**

Natakkar Ram Ganesh Gadkari Marg,  
Vile Parle (West), Mumbai – 400 056.

**DIPLOMA IN INFORMATION TECHNOLOGY**  
**(Three Years Full Time) w.e.f. – July, 2008**  
**Autonomous Course, Multi Point Entry & Credit System,**  
**Non Sandwich Pattern**

### **OBJECTIVES**

- 1) Impart knowledge to the students in the field of Information Technology.
- 2) Make the students enable to pursue higher education if they wish.
- 3) Make the students eligible to be absorbed by industry at supervisory level.
- 4) Incorporate the knowledge of emerging technology as per the requirement.

### **CURRICULUM**

Shri Bhagubhai Mafatlal Polytechnic started 3/4 Years Diploma courses and was affiliated to the Board of Technical Examinations, Maharashtra State, in 1963. Since 1969, academic freedom was granted to the Polytechnic. Since 1978 – 79 academic freedom was extended to all the full-time diploma courses. In 1989 –90, full autonomy was granted to all seven full time diploma courses.

As a further development to the above, the multi-point entry and credit system (MPECS) was initiated in 1981 on progressive basis. In this scheme students can regulate their pace of studies within the rules prescribed.

From 1993-94, full academic autonomy was extended to all the courses of the Institute which includes full-time diploma, part-time diploma, and post-diploma courses. The students have to qualify for appearing in the final examinations are conducted by the institute and the final diploma is awarded by the institute at the convocation function.

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**DIPLOMA IN INFORMATION TECHNOLOGY**

The Course is Three Years Full Time Diploma in Information Technology (Un-aided) with Non-Sandwich Semester-Pattern having Multipoint Entry & Credit System. In this era of Information Technology revolution, the computer systems are playing an important role in every aspect of human life for automation, from simple office automation to decision support systems, production planning to e-commerce, communication, online education etc. To ensure effective/ proper utilization of these computer systems by the software professionals it is necessary that the electronic components of the computer system and its associated peripheral devices and network, work efficiently without breakdown. This demands technicians having good knowledge and skills of computer engineering in maintaining computer hardware easily and quickly. In addition, the continuous changing technologies in the field of Microelectronics, Communication technology and Computer Technology have created newer and changing demands for new knowledge and skills in Diploma pass-outs implying a positive attitude towards self learning and adaptability.

Therefore, this Diploma in Information Technology programme envisages in developing competent technicians with a number of professional skills who can perform their jobs in the industry or as an entrepreneur effectively and efficiently. In the industry or in small business/ educational establishments the technician with necessary skills will be able to plan, procure and install computer hardware and software, test and certify them. The programme will develop the competency required to assemble computer system, maintain the computer resources in running condition and troubleshoot and repair the computer hardware in the case of breakdown. The technicians will also be able to install and manage computer networks. As an entrepreneur he will be to manage his computer-related enterprise and market his products and services. At the same time the skills related to software that are required to manage the computer hardware and networks will also be developed. The basic competencies that are required for designing and developing software systems will also be developed in the technicians in case he wants to take it as a career.

The emphasis of the course is on Information Technology with Computer Education at a Technician Level covering Knowledge of Software: Programming Languages, System Analysis and Design, Database, Concepts of Operating Systems, Data structure, Communication related topics, Internet, Entrepreneurship, Hardware: electronic Devices, Digital Elex., robotics, Computer Peripherals at higher semesters alongwith basic Subjects – Mathematics, Physics, Communication Skill /Generic skill, basics of Engineering drawing in first and second semester. The content of syllabus is having weightage of around appx. 70% to 30% as software to hardware respectively. After Completion of Diploma, student will be able to work as:

- A Database Administrator
- Programmer
- System Network Administrator
- Web Application Developer
- Customer Support

For Award of Diploma under Multipoint Entry & Credit System, the student/candidate has to earn total 180 credits including compulsory subjects out of total available 213 credits from 36 subjects. The examination pattern /scheme will be same as per the other diploma examination of this institute. The Final Award of Grade will be given on the basis of marks obtained in the final year of Information Technology i.e. (3<sup>rd</sup> year)Vth & VIth Semester under grade point average scheme/criteria/norms as laid down in the MPE&C System.

Full Time Diploma in Information Technology Course is approved by All India Council For Technical Education (AICTE) vide file no. 418/EX/GEN/2002 and by Department of Higher and Technical Education, Government of Maharashtra vide G.R.No.PTI 202/K(182/02)/TE-2 dated 15<sup>th</sup> July,2002.

The Course is approved by AICTE vide their reference each F.No. 740-89-007/E/RC/95/TME-1963 dated:13/08/2004. The approval of equivalence to Diploma is granted by Maharashtra State Board of Technical Education vide their Certificate No. MSBTE/ D-53/ SBMP EQU/2004/5989 dated: 30/07/2004.

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**LIST OF SUBJECTS SEMESTER WISE FOR**  
**DIPLOMA IN INFORMATION TECHNOLOGY**

**w. e. f. Batch admitted in July, 2008**

					Scheme L/Pr/Cr	Gr	
I <sup>st</sup> Year	I <sup>st</sup> Sem.	(1)	Fundamentals of Computer & Networking System	IT-35	246	C*	
		(2)	Communication skill	IT-2	303	B*	
		(3)	Mathematics – I (Ver. 2.0)	IT-41	404	C*	
		(4)	Electronic Devices & Circuits – I	IT-4	326	C*	
		(5)	Engineering Graphics	IT-37	246	B*	
	II <sup>nd</sup> Sem.	(6)	Mathematics – II (Ver 2.0)	IT-42	404	B*	
		(7)	Electronic Devices & Circuits – II	IT-7	426	C*	
		(8)	Programming in C++	IT-8	326	C*	
		(9)	Physics	IT-9	348	B*	
		(10)	Development of Generic Skill	IT-10	303	B*	
II <sup>nd</sup> Year	III <sup>rd</sup> Sem.	(11)	Digital Electronics	IT-11	326	C*	
		(12)	System Programming	IT-12	326	A*	
		(13)	Data Base Management System	IT-13	326	C*	
		(14)	Numerical Analysis	IT-14	426	B	
		(15)	Elements of Computer Engineering	IT-15	426	C	
		(16)	Software Engineering	IT-16	426	A	
	IV <sup>th</sup> Sem.	(17)	Data Structure	IT-17	426	B*	
		(18)	Computer Peripherals & Devices	IT-18	426	C	
		(19)	Communication Systems	IT-19	427	A	
		(20)	Fundamentals of Operating System	IT-36	426	C*	
		(21)	Visual Basics	IT-21	426	A*	
		(22)	Open Source Technology	IT-43	134	C	
III <sup>rd</sup> Year	V <sup>th</sup> Sem.	(23)	Multimedia & Animation	IT-38	347	A	
		(24)	Fibre Optic Communication	IT-23	426	C	
		(25)	Networking & Security	# IT-24	326	M*	
		(26)	Computer Graphics	# IT-25	326	A*	
		(27)	TCP/ IP - Internet	# IT-26	426	A	
		(28)	Communication (Antenna Theory)	IT-27	336	C	
	VI <sup>th</sup> Sem.	(28)	Elective I (Any One) #	#			
			(28.1) System Analysis & Design	IT-28	326	A	
			(28.2) e – Commerce	IT-32	426	A	
			(28.3) Entrepreneurship Development	IT-29	606	M	
	(29)	Project	# IT-30	099	A*		
	(30)	Web Technology	# IT-31	426	A		
	(31)	Elective II (Any One) #	#				
		(31.1) Robotics	IT-33	336	A		
		(31.2) Object Oriented Modelling & Design	IT-39	326	A		
		(31.3) LINUX Administration	IT-40	326	A		
	(32)	Information Technology (Ver 3.0)(Revised every year)	# IT-34	426	A*		

Total Credit: 213

\* Compulsory Group

Total Credits Offered = 213 (Compulsory Credit=115, Optional Credit=98)

Total Minimum Credits Required for Award =180

	Max. Credit	Compulsory Credit	Optional Credit
B= Basic	36	30	06
C= Core	70	46	24
A= Applications	95	33	62
M= Management	12	06	06

**Note :** I) 1 Tutorial hour / period = 1 Practical hour / session for Practical subjects & 1 Tutorial hour to be treated as 1 Theory / Assignment for non-Practical Subjects.

II) # Discipline oriented award winning subjects for Diploma along with Vth & VIth semester Subjects registered.

Registration Prerequisite required of Term Work granted for post subject study (Discipline Subject).

Sr. No.	Prerequisite Subject Code	Post Subject Code	Sr. No.	Prerequisite Subject Code	Post Subject Code
1.	IT-35	IT-36 / IT-40	6.	IT-19	IT-23
2.	IT-4	IT-7	7.	IT-21	IT-28
3.	IT-8	IT-12 / IT-17/ IT-20 / IT-25 / IT39	8.	IT-36 / IT-21	IT-30
4.	IT-30 / IT-16	IT-28	9.	All * - Sem. I to V	IT-30
5	IT-21	IT-31	10.	IT-12	IT-20

Note: Refer Exam scheme term wise in the syllabus copy &

- i) Sessional is to be accessed by Internal Examiner
- i) Theory & practical is to be accessed by Internal Examiner & External Examiner combined.
- ii) Termwork is to be accessed by Internal Examiner & External Examiner as per the ratio.
- iii) Weightage for sessional marks will be of 20% & for Term End theory exam will be of 80% combinely considered for the subject award out of 100% weightage.

For Award of Diploma under Multipoint Entry & Credit System, the student / candidate has to earn total 180 credits including compulsory subjects out of total available 213 credits from 36 subjects. The examination pattern / scheme will be same as per the other diploma examination of this institute. The Final Award of Grade will be given on the basis of marks obtained in the final year of Information Technology i.e. Vth & VIth Semester including discipline oriented Award winning subjects only under grade point average scheme / criteria / norms as laid down in the MPE&C System.

**Shri Vile Parle Kelavani Mandal's**  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**

**I<sup>st</sup> Semester (Diploma in Information Technology) w. e. f. Batch admitted in July, 2008**

Sr. No	Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
		Lecture	Pract. of Drg.	Tutorial		Sessional Work	Paper	Term work Pract.	Exam	Total		
1.	Fundamentals of Computer & Networking System	2	4	--		20	-	50	50	120	IT-35	246
2.	Communication Skill	2	--	1	1,3 Hrs., 100 Mks.	20	80	--	--	100	IT-2	303
3.	Mathematics – I (Ver. 2.0)	3	--	1	1, 3 Hrs., 100 Mks.	20	80	--	--	100	IT-41	404
4.	Electronic Devices & Circuit-I	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT-4	326
5.	Engineering Graphics	2	4	--	1, 3 Hrs., 100 Mks.	20	80	25	25 oral	150	IT-37	246
Total		12	10	3	4 Paper	--	--	--	--	670		
Total Periods: 27		Total Marks: 670										

**1 Lecture / Tutorial / Practical = 1 Hour**

Note:

- i) Sessional is to be accessed by Internal Examiner
- ii) Theory & practical is to be accessed by Internal Examiner & External Examiner combined.
- iii) Term work is to be accessed by Internal Examiner & External Examiner as per the ratio.
- iv) There will be three periodical test of 25 Marks for each subject. Best of two periodical test marks will be considered as a sessional of 20 % weightage.
- v) Final term end examination will be of 100 marks having weightage of 80%

**FUNDAMENTALS OF COMPUTER & NETWORKING SYSTEM (IT-35)**

(T.W.= 50 Marks, Pr.= 50 Marks, Lecture 2/week ,

Practical 4/week , Credit :6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work Paper	Term work Pract.	Exam	Total			
<b>Fundamentals of Computer &amp; Networking System</b>	2	4	--			20	-	50	50	120	<b>IT-35</b>	246	

**Rationale :**

This subject envisages to make the students know the fundamentals of computer systems and its organisation. It will enable the students to comprehend the organisation and working of various units of personal computer system for storing and processing information. It will also help the students to have hands on experience of operating systems and different application software used for office automation, day to day problems sharing in particular for creating business documents, data analysis graphical representations and business presentations. It also deals with basics of Internet technology available services internet connectivity and accessing information on internet. The student will also familiarize themselves with case study on Linux o.s., its design architecture, command structures, utilities and Linux

**Objective:**

The student will be able to :

1. Get familiarized with computerisation.
2. Utilise computers in engineering /technical field.
3. Use computer concepts for Microsoft applications
4. Promote Computer Literacy and Programming Skills.
5. Study of Linux as Operating System & Shell Programming
6. Made to expose towards computer area.
7. Learn networking concepts
8. Operate Internet/e-mail facility

**Theory Contents :****1. Fundamentals of Computer concepts :****(Periods-6 hrs, Mks-20)**

To acquaint with computer Hardware and Software, To get familiar with various operating system (DOS);To use DOS internal commands ;To familiarise with DOS external commands; Study of computer specifications PC, PC-XT , PC-AT, Pentium and its applications, general architecture of computers; Computer peripherals ( I/O Device ),CD player , Storage units , floppy diskette , printers and output peripherals; General computer terms, computer software, applications software , operating systems, advantages of software and application packages.

**2. Introduction to Windows:****(Periods-5 hrs, Mks-10)**

Structure of a Window, Basic techniques for working in Windows, Using Menus; Working with A dialogue box, Type of Options ; Starting Windows , Task Bar, Start Menu  
3 Introduction to MS-Office

**3.1 Introduction to WORD package****(Periods-2 hrs, Mks-15)**

Starting Word Document ; Typing and Editing text, Copying and Moving, Typing Special Characters ( Symbols ); Some common features : Changing the case of text, Moving & copying text with drag and drop, Justifying text, inserting bulleted & numbered lists , Arranging and moving between open documents; Finding and replacing, formatting ; Using the spell checker , Checking grammar

**3.2 Concepts of POWER POINT****(Periods-2 hrs, Mks-15)**

How to make an effective presentation, Physical aspects of presentation ; A Presentation Graphics package ; Creating a presentation : creating a Title slide, Creating a Graph, Creating Tables, Make Organization Chart, To Save and close presentation; Working with Tools: Create , Edit, Move, Delete , Resize , Format text object, Working with Graphics tools; Slide show

**3.3 Fundamentals of EXCEL****(Periods-2 hrs, Mks-15)**

Starting EXCEL: What is a spreadsheet, creating & editing spreadsheet, modifying the sheet . Study of Toolbars, Formula bar and Status bar. Inserting Header and footer, cells, rows, columns, worksheet, formatting individual cells row, column, sheet, manipulating Data by using Sort. Saving and Retrieving saved worksheet.

**4. LINUX as Operating System****(Periods-6 hrs, Mks-25 )****Linux Fundamentals**

Basics of Unix & Linux, Multi-user & Multitasking capabilities of Linux, change of password, the file types, structures of file system, important directories of the file system.

5 Introduction to Shell Programming

**(Period-5 hrs, Mks-24 )**

What is Shell. Tools for working with Linux & Shell Programming. Function of a Shell, access permissions of file in Linux, editing files with Vi. Important commands related to Vi editor. Introduction to Bash Shell basics, Shell. Bash variables, basics scripts element (input / output), simple Shell programs.

6. Networking and LAN commands (Periods-2 hrs, Mks-20)  
 Network Concept and classification; Local Area Network(LAN) : LAN Topology, LAN Software / Operating System, LAN commands and elementary Administrative commands like ATTACH, BROADCAST, CAPTURE, LOGIN, LOGOUT, MAP, REVOKE, RIGHTS, SYSCON, SYSTIME.

**7. Introduction to INTERNET :**

(Periods-2 hrs, Mks-20)

What is INTERNET, Application of INTERNET: E-mail, TELNET, WWW, Study of various search engine using LYNX, LOGIN PROCEDURE, Study of INTERNET EXPLORER, Creating mailing account, Difference between SHELL and TCP/IP account. Surfing using WORLD WIDE WEB information relating to employment, education, alumni.

The Distribution of Marks / weight age of each topic specified in this subject is considered taking into account sessional / assessment Exam.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Fundamentals of Computer concepts	06	20	12	E
2.	Introduction to Windows	05	10	07	E
3.	Introduction to WORD package	02	15	09	M
4.	Concepts of POWER POINT	02	15	09	M
5.	Fundamentals of EXCEL	02	15	09	M
6.	Linux Fundamentals	06	25	16	M
7.	Introduction to Shell Programming	05	24	14	M
8.	Networking and LAN commands	02	20	12	M
9.	Introduction to INTERNET	02	20	12	E
		<b>32</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. Fundamentals of Computer concepts
2. Introduction to Windows
3. Introduction to WORD package
4. Concepts of POWER POINT
5. Fundamentals of EXCEL

**Section II**

6. Linux Fundamentals
7. The File System in Linux
8. Introduction to Shell Programming
9. Networking and LAN commands
10. Introduction to INTERNET

**Total Theory Hrs.= 32 hrs**

**Total Practical Hrs. = 64 hrs.**

**List of practical:**

- 1) Study of Computer hardware and peripherals
- 2) Study of DOS Internal and External Commands
- 3) i) Getting started with Windows by using different menus and working with dialogue box  
 ii) Study of Control panel , Screen saver and Help commands using Windows
- 4) i) Creating, Editing and Saving a document , Table using Word package creating Document with Table ,editing using special characters & saving.  
 ii) Study of tool bar menus like Standard , Formatting , Tables and Borders  
 iii) Study of spell check , find , replace , go to , page setup , print preview and print commands.  
 i) Creating a new presentation and getting acquainted with various menus like FILE, EDIT, VIEW, INSERT, FORMAT, TOOLS, SLIDESHOW  
 ii) Choosing Auto Layout and working with tools and to prepare a slide show  
 iii) To study special effects using one slide show demonstration
- 6) Creating Spread Sheet for various combinations of computational tables.
- 7) LINUX basic commands.
- 8) LINUX Advanced commands.
- 9) Creating file using Vi editor, editing, saving file & quit from Vi editor.
- 10) Study of different run levels.
- 11) Shell Programming-I
- 12) Shell Programming -II.
- 13) Study of KDE environment
- 14) Networking concepts and LAN commands.
- 15) Introduction to administrative command like Create Users, Mapping, Assigning , etc.
- 16) Internet terms, Use of Shell account and study of mailing , Software to send & receive mail on Hard Disk.

17) To study internet explorer package & retrieve education related information from TCP/IP account and downloading procedure

Note:- Minimum of twelve experiments must be performed /completed in journal for approval of term work acceptance other than the 75% requirement of attendance.

**Reference Books :**

1. Computer and Common sense by Hunt & Shelly.
2. Computer Fundamentals by V. Rajaraman ( Prentice hall)
3. PC Guide for Windows (ITC Publication/Galgotia publication)
4. Learning Word 6.0 for Windows step-by-step, Galgotia.
5. Linux: TheComplete reference - 5/E by pettersen
6. Unleashed Linux

***Additional References:***

1. Mastering MS Office (BPP Publication)
2. Data Communications and Distributed Networks, U.D. Black, Prentice-Hall



**COMMUNICATION SKILLS (IT-2)**

(One Paper-03 Hrs, Theory=100 Marks, Lecture 2 / Week , Credit-3)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total		
Communication Skill	2	--	1	1,3 Hrs., 100 Mks.	20	80	--	--	100	IT-2	303

**Rationale:**

To develop the basics of communication, composition.

**Objective:**

- 1.Students will understand the process of communication.
2. Students will learn the basic and applied language skill useful for the study of technical subjects as well as communication with a particular emphasis on writing & oral presentation skill needed for professional career as middle level manager.

**Theory Contents :****1. Aspects of Communication, nature of communication****(Periods-3 hrs, Mks-16)**

- a) Definition, need and importance of communication skills
- b) Basic types of communication

Components of the communication system.

Sender – receiver variables.

Modes of communication – human interactive periodical representations, written symbols &amp; sound.

Media/channels of communication – types of Media – Print – non print, graphic, electronic.

The communication Process – selecting modes and Media, uncoding, decoding, transmitting message, feedback.

Barriers of Communication.

Principles of communication and conditions for effective communication

**Language Grammar****(Periods-4hrs, Mks-21)**

Basic grammar, Morphemes, word formation process – conversion and compounding transformation of words.

Determines and modifiers

Units of Expression and units of meaning graphemes and phonemes, morphemes, words, phrases, clauses, sentences.

Common errors to be taught along with parts of speech

**2. Verbal Communication****(Periods-16 hrs, Mks-80)**

Principles of written communication

The process of formal written communication: Designing and arranging ideas and preparing outlines; Developing a message : writing, evaluating, revising and editing.

The qualities of good writing: the 'YOU' attitude, clarity, conciseness, preciseness, style, flow, accuracy, and readability.

Principles of message organization: topic, transitional and concluding sentences; Levels of meaning: conceptual, prepositional, contextual and pragmatic meaning; Independent function sentences.

Features of technical writing: Problem-solving situations, collaboration, technical and sub-technical vocabulary, use of visuals, use of formats.

Mechanics of writing: spacing and indentation; use of equations, numerals, references and access devices; spelling and punctuation;

**Writing Skill**

The following forms of communication

Business correspondence – letters of enquiry, reply to enquiry, order, complaint, adjustment and application

Reports – investigation, progress, appraisal, laboratory, feasibility and trouble

Principles of oral Communication formal oral communication, designing oral message, Analysing audience, selecting method presentation, extemporaneous speech, presentation of formal speech.

Oral skills.

Phonic system of English Language, Speech sounds, vowels, consonants syllable, diphthongs, and word accent;

Improving intelligibility of spoken language

### 3. Non-verbal Communication

(Periods-4 hrs, Mks-21)

Principles of No-Verbal Communication

Non-verbal skills – Illustration texts with figures and diagrams, Body language

### 4. Professional Communication Skills

(Periods-5 hrs, Mks-26)

Communication in Organizations - Business and industry, Vertical horizontal communication, formal and informal routes of communication

Using integrated skill of communication, Integrating verbal skills, Integrating verbal and non-verbal skills, Integrated Technique of Communication

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D	
1.	Aspects of Communication, nature of communication	03	16	10	D	
2.	Language Grammar	04	21	15	E	
3.	Verbal Communication	16	80	35	M	
4.	Non-verbal Communication	04	21	15	E	
5.	Professional Communication Skills	05	26	25	M	
		<b>Total</b>	<b>32</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Aspects of Communication, nature of communication
2. Language Grammar
3. Verbal Communication (Half Portion)

#### Section II

3. Verbal Communication (Remaining Half Portion)
4. Non-verbal Communication
5. Professional Communication Skills

**Total Contact Hrs. = 32**

Reference Books :

1. Human Communication, Burqoon, Michael : London Sage Publications 1994
2. A Communicative Grammar of English, Geoffrey Leech and Jan Svartvik : Essex, Longman Group Ltd., 1975, rpt., E.L.B.S., 2<sup>nd</sup> edition, 1994.
3. University grammar of English, Randolf Quirk and Sidney Greenbaum : Essex, Longman Group Ltd. 1973., rpt., E.L.B.S., 1993
4. Collins Cobuild English Grammar Ed. John Sinclair, London, William Collins Sons & Co. Ltd., 1990; rpt., Indus, 1991.
5. Technical Writing and Professional Communications, Thomas Huckin and Leslie Olson : New York; McGraw-Hill, 1991
6. Business English and Communication, Lyn Clark and Zimmer : New York; McGraw-Hill, 1988
7. Excellence in Business Communication John Thill and Courtland Boves : New York; McGraw-Hill, 1991

#### Additional References:

1. Spoken English for India, R.K. Bansal and J.B. Harrison: New Delhi, Orient Longman, 1972
2. Better English Pronunciation, J.D. O'Connor : London; Cambridge University Press, 1967; rpt. E.L.B.S., 1970.
3. Developing Communication skills, Krishna Mohan and Meera Banerji : New Delhi; Macmillan

**Data Book** : Longman Dictionary of Contemporary English : Essex, Longman Group Ltd., 1989

rpt., Orient Longman, 1994. Codes of Practice : IS : 790 – 1887 – Guidelines for Preliminary pages of a Book

**MATHEMATICS-I (Ver. 2.0) (IT-41)**

(One Paper- 3 Hrs. Theory =100,

Lectures: 3/Week; Tutorial: 1/Week, Credit: 4)

**Teaching And Examination Scheme:**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total		
Mathematics – I	3	--	1	1, 3 Hrs., 100 Mks.	20	80	--	--	100	IT-41	404

**Rationale:**

Algebra, Trigonometry and Coordinate Geometry are introduced as prerequisite for the topics to be studied later on to solve the engineering problems.

**Objective:**

- (i) The students will be able to use the Mathematical Methods to solve the engineering problems
- (ii) Students will be able to use principles to solve problems in Mathematics at Higher Semester level.

**Theory Contents:****1. Trigonometry:****(Periods-18 hrs, Mks-62)**

- 1.1 Trigonometric ratio of any angle, Definition of radian, Length of arc of sector  $s=r\theta$   
Area of sector  $A = \frac{1}{2} r^2 \theta$ ,  $\theta$  in radians.
- 1.2 Trigonometric ratios of allied, compound angles and multiple angles
- 1.3 Inverse Circular trigonometric functions
- 1.4 Properties and solution of triangle
- 1.5 Solution of trigonometric equation by graph

**2. Matrices:****(Periods-06 hrs, Mks-20)**

- 2.1 Definition of a matrix of order  $m \times n$ . types of matrices.
- 2.2 Addition and subtraction of two matrices
- 2.3 Multiplication of a matrix by a scalar, multiplication of two matrices.

**3. Algebra:****(Periods-24 hrs, Mks-82)**

- 3.1 Determinant, Properties of Determinant without proof, Use of Determinant in solving equations and condition of consistency of equation.
- 3.2 Partial fractions
- 3.3 Binomial theorem
- 3.4 Progression (A.P./G.P.)
- 3.5 Permutations and Combinations

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Trigonometry:	18	62	35	M
2.	Matrices	06	20	15	E
3.	Algebra	24	82	50	M
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Trigonometry
2. Matrices

#### Section II

1. Algebra

#### Reference Books:

- (1) Mathematics for polytechnic students I & II, by S.P. Deshpande.
- (2) Engg. Mathematics-I & II, by G.V. Kumbhojkar
- (3) Applied Mathematics-I, by Patel/ Rawal & others.

#### Additional References:

- (1) Engg. Mathematics (1<sup>st</sup> year), by Patel Rawal.

**ELECTRONIC DEVICES AND CIRCUITS – I (IT-4)**

(One Paper –3 Hrs., Theory=100 Marks, T.W.= 50 Marks, Pr.= 50 Marks,  
Tutorial – 1/Week, Lecture 3/Week , Practical 2/Week , Credit : 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total		
<b>Electronic Devices &amp; Circuit-I</b>	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	<b>IT-4</b>	326

**Rationale:**

The students of IT come across many electronic devices in day to day life. This subject provides essential competency in understanding the electronic circuits. This introduces various electronic devices and their applications.

**Objectives:**

- 1) Identify the different Components & classify them.
- 2) Identify different Devices, char, working.
- 3) Appreciate use of different Transistors, amplifier, oscillators.
- 4) Design simple circuits using above comp.

**Theory Contents :****1. Semiconductors****(Periods-3 hrs, Mks-15)**

Intrinsic and Extrinsic semiconductors, electrons and holes in an intrinsic semiconductor, donor and acceptor impurities, diffusion, carrier life time, effect of temperature on intrinsic and extrinsic semiconductors.

**2. Semiconductor diode characteristics****(Periods-5 hrs, Mks-15)**

Open circuited p.n.junction as a diode, current components in a P.N. diode, current components in a P.N. diode, V.I. characteristics and its temperature dependence, diode resistance, load line concept, piecewise linear diode model, transition capacitance, diffusion capacitance, diode switching time, junction diode data sheet.

**3. Breakdown diodes****(Periods-3 hrs, Mks-12)**

Zener diode, Schottkey diode, V.I. characteristics, zener diode voltage regulator, zener and schottkey diode data sheet.

**4. Rectifiers****(Periods-7 hrs, Mks-20)**

Half wave rectifier, Full wave rectifier, ripple factor, T.U.F. Ratio of rectification

**Filters:**

L.filter, C.filter, L.C.; C.L.C.; Multiple L.C. and C.R.C. filter, their ripple factor with assumptions and voltage regulation. Problem based on above topic.

**5. Clipping and clamping circuits****(Periods-3hrs, Mks-11)****6. BJT****(Periods-7 hrs, Mks-15)**

The junction transistor, transistor current components, transistor as an amplifier, transistor configurations and characteristics, Graphical analysis of the C.E. configuration, Analysis of cut-off and saturation regions, Typical transistor junction voltages, transistor switching times and ratings, transistor as a switching times and ratings, transistor as a switch.

**7. Transistor biasing and thermal stabilisations****(Periods-3 hrs, Mks-16)**

The operating point, effect of temperature on operating point, bias stability, different biasing circuits and their thermal stability, bias compensation techniques, problems based on above topics.

**8. Transistor at low frequencies****(Periods-3 hrs, Mks-24)**

Black box theory, h-parameters, small signal low frequency transistor hybrid model, analysis of C.E. configuration using accurate hybrid model, approximate h-equivalent circuit for the three transistor configurations and their comparison, analysis of common emitter amplifier with an emitter resistance, analysis of direct coupled and R.C. coupled multistage amplifier using h-parameter.

Examples based on above topics.

**9. Miller's theorem, Darlington amplifier, Boot strapping****(Periods-2 hrs, Mks-10)****10. Frequency response of BJT amplifiers****(Periods-7 hrs, Mks-16)**

Single stage C.E. amplifier and its frequency response, effect of coupling and emitter bypass capacitors on low frequency response, step response of an amplifier, Hybrid transistor model at high frequencies, C.E. short circuit current gain, gain band width product. Examples based on above topics.

**11. Multistage amplifiers****(Periods-5 hrs, Mks-10)**

Decibel, types of coupling, direct coupled, R.C. coupled and transformer coupled and transformer coupled amplifiers and their frequency response, effect of cascading on B.W. and gain ( $A_v$ ), Classification of amplifiers.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Semiconductors	03	15	07%	M
2.	Semiconductor diode characteristics	05	15	09%	M
3.	Breakdown diodes	03	12	07%	D
4.	Rectifiers	07	20	13%	E
5.	Clipping and clamping circuits	03	11	07%	M
6.	BJT	07	15	13%	M
7.	Transistor biasing and thermal stabilisations	03	16	09%	E
8.	Transistor at low frequencies	03	24	10%	E
9.	Miller's theorem, Darlington amplifier, Boot strapping	02	10	6%	E
10.	Frequency response of	07	16	12%	E
11.	Multistage amplifiers	05	10	07%	D
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

BJT amplifiers

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

- Semiconductors
- Semiconductor diode characteristics
- Breakdown diodes
- Rectifiers
- Clipping and clamping
- BJT

**Section II**

- Transistor biasing and thermal stabilisations
- Transistor at low frequencies
- Miller's theorem, Darlington amplifier, Boot strapping
- Frequency response of BJT amplifiers
- Multistage amplifiers

**Total Theory Hrs.= 48 hrs**

**Total Practical Hrs. = 32 hrs.**

**List of Practicals**

- Study of dual channel CRO.
- Diode (Ge, Si) characteristics and effect of temperature
- Zener diode characteristics and effect of temperature.
- Study of H.W.R./F.W.R. with/without filter.
- Study of zener voltage regulator.
- I/P and O/P characteristics of C.B. configuration
- I/P and O/P characteristics if C.E. configurations
- BJT operating point and load lines, effect of temperature.
- To study different biasing circuits and compare their performance w.r.t. temperature variations.
- To study the frequency response of single stage C.E. amplifier.

11. To study the frequency response of single stage C.B. Amplifier
12. Miller's theorem
13. To study the frequency response of two stage R.C. coupled amplifier.
14. To study step response of C.E. Amplifier
15. Measurement of C.E. h-parameters.
16. Effect of CE and CC on low frequency response of an amplifier
17. Diode clipping circuits.
18. Diode clamping circuits.

**Reference Books :**

1. Integrated electronics by Millman and Halkias
2. Electronic devices and circuits by Millman and Halkias
3. Microelectronics by Jacob Millman
4. Electronics devices and circuits theory by Robert Boylestad.

***Additional References:***

1. Electronic devices and circuits by Allen Mottershed
2. Basic electronics and linear circuits by Bhargava
3. Electronics-I by R. G. Karandikar.
4. Basic Electronics by V.K.Mehta.

**ENGINEERING GRAPHICS (IT-37)**

(One Paper – 3 hrs, Theory: - 100 Marks, T.W. = 25 Marks, Oral =25Mks

Lecture: 2/Week, Pract. : 4/Week, Credit: 6)

**Teaching and Examination Scheme:**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total		
Basics of Engineering Drawing	2	4	--	1, 3 Hrs., 100 Mks.	20	80	25	25 oral	150	IT-37	246

**RATIONALE:**

Engineering Graphics is the language of engineers. The concepts of Engineering Graphics are used to develop, express the ideas, and conveying the instructions which are used to carry out jobs in the field Engineering. The course illustrates the techniques of graphics in actual practice. This preliminary course aims at building a foundation for the further course in drawing and other allied subjects.

**OBJECTIVES:**

The student should be able to: -

- 1) Draw different engineering curves and know their applications.
- 2) Draw orthographic projections of different objects.
- 3) Visualize three dimensional objects and draw Isometric Projections.
- 4) Use the techniques and able to interpret the drawing in Engineering field.
- 5) Use computer aided drafting packages.

**Theory Contents:****1. Drawing Instruments and their uses****(Periods 05, Marks 28)**

Letters and numbers (single stroke vertical), Convention of lines and their applications, Scale (reduced, enlarged & full size) plain scale and diagonal scale, Sheet layout, Introduction to CAD (Basic draw and modify Command), Geometrical constructions.

**2. Engineering curves & Loci of Points.****(Periods 09, Marks 45)**

To draw an ellipse by: Directrix and focus method, Arcs of circle method, Concentric circles method, To draw a parabola by: Directrix and focus method, Rectangle method, To draw a hyperbola by: Directrix and focus method, passing through given points with reference to asymptotes, Transverse Axis and focus method, To draw involutes of circle & polygon (up to hexagon), To draw a cycloid, epicycloids, hypocycloid, To draw Helix & spiral, Loci of Points:

Loci of points with given conditions and examples related to simple mechanisms.

**3. Orthographic projections****(Periods 06, Marks 30)**

Introduction to Orthographic projections, Conversion of pictorial view into Orthographic Views (First Angle Projection Method Only), Dimensioning technique as per SP-46

**4. Isometric projection****(Periods 05, Marks 26)**

Isometric scale, Conversion of orthographic views into isometric View/projection(Simple objects) Projection of Straight Lines and Planes (First Angle Projection Method only).

**5. Planes****(Periods 07, Marks 35)**

Lines inclined to one reference plane only and limited to both ends in one quadrant, Projection of simple planes of circular, square, rectangular, rhombus, pentagonal, and hexagonal, inclined to one reference plane and perpendicular to the other.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Drawing Instruments and their uses	05	28	15	E
2.	Engineering curves & Loci of Points	09	45	30	M
3.	Orthographic projections	06	30	20	E
4.	Isometric projection	05	26	15	D
5.	Planes	07	35	20	M
<b>Total</b>		<b>32</b>	<b>164</b>	<b>100%</b>	<b>#</b>



(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. Drawing Instruments and their uses
2. Engineering curves & Loci of Points.

### Section II

3. Orthographic projections
4. Isometric projection
5. Planes

**Total Theory Hours =: 32 hrs.**

**Total Practical Hours = 64 hrs**

### List of Practicals

#### 1. Introduction to graphics

Draw Rectangle, Circle, Pentagon, Hexagon, one figure containing circle tangent, arc and dimensioning using CAD with given dimensions

#### 2. Engineering curves & Loci of points

- i) Three different curves are to be draw using any one method.
- ii) Draw locus of point on any one mechanism

#### 3. Orthographic projections

- i. Two objects by first angle projection method
- ii. Redraw the same sheet using CAD

#### 4. Isometric projection

- i. Two objects one by true scale and another by isometric scale (simple objects).
- ii. Redraw the same sheet using CAD

#### 5. Projections of line and planes.

Two problems on Projection of lines and two problems on Projection of Planes.

#### 6. To draw layout of visited Industry, College using CAD

#### 7. To draw orthographic projection of given machine element using CAD

### Reference Books

1. N. D. Bhatt- Engineering Drawing- Charotar Publishing House
2. K. Venugopal- Engineering Drawing and Graphics+ AutoCAD- New Age Publication
3. Auto Cad User Guide

### Additional References:

P.J. Shah.- Engineering Drawing

**Shri Vile Parle Kelavani Mandal's**  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**

**II<sup>nd</sup> Semester (Diploma in Information Technology)**

w. e. f. Batch admitted in July, 2008

Sr. No	Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
		Lecture	Pract. or Drg.	Tutorial	Sessional Work		Paper	Term work	Pract. Exam	Total			
1.	Mathematics – II (Ver 2.0)	3	-	1	1,3 Hrs., 100 Mks.	20	80	-	-	100	IT-42	404	
2.	EDC – II	4	2	-	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT-7	426	
3.	Programming in C++	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT-8	326	
4.	Physics	3	4	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT-9	348	
5.	Development of Generic skill	2	-	1	1,3 Hrs., 100 Mks.	20	80	-	-	100	IT-10	303	
Total		15	8	4	5 Papers	--	--	--	--	800			
Total Periods:		27			Total Marks: 800								

Lecture / Tutorial / Practical =1 Hour

**Note:**

1. Sessional is to be accessed by Internal Examiner
2. Theory & practical is to be accessed by Internal Examiner & External Examiner combined.
3. Term work is to be accessed by Internal Examiner & External Examiner as per the ratio.
4. There will be three periodical test of 25 Marks for each subject. Best of two periodical test marks will be considered as a sessional of 20 % weitage.
5. Final term end examination will be of 100 marks having weitage of 80%

**MATHEMATICS-II (Ver. 2.0) (IT-42)**

(One Paper- 3 Hrs. Theory =100,

Lectures: 3/Week; Tutorial: 1/Week, Credit: 4)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total		
Mathematics – II	3	--	1	1, 3 Hrs., 100 Mks.	20	80	--	--	100	IT-42	404

**Rationale :**

1. Creating aptitude for Mathematics of Higher Semesters.
2. Focusing attention of problem solving in liberal sense. This aspect should take care of
  - (a) Intelligent combination of techniques.
  - (b) Mathematization or mathematical modelling of problems involved in various branches of knowledge.
3. Nurturing the higher order mental process of logical reasoning with rigor and precision.

**Objective:**

The topics are introduced as

1. Prerequisite for many topics such as integral calculus, differential equations, Fourier series, etc., to be studied later.
2. To introduce the applications commonly required.

**Theory Contents:****1. Coordinate geometry:****(Periods-24 hrs, Mks-82)**

- 1.1 Straight line: Slope of a line; X and Y intercepts of a line, point of Intersection of two straight lines, Acute angle between intersecting lines, Perpendicular distance of a point from the line, distance between two parallel lines.
- 1.2 Circle: Centre-Radius form of an equation of a circle, General equation of a circle
- 1.3 Equation of a chord, tangent and normal to any circle.

**2. Complex Number:****(Periods-10 hrs, Mks32)**

- 2.1 Definition of a complex number
- 2.2 Elementary Operations
- 2.3 Polar form of a complex number, exponential Form of a complex number
- 2.4 Argand Diagram

**3. Vector Algebra:****(Periods-08 hrs, Mks-24)**

- 3.1 Scalars and Vectors
- 3.2 Addition of Vectors
- 3.3 Dot product and Cross product
- 3.4 Scalar triple product
- 3.5 Application: work done by a force, moment of a force about a point. Area of a parallelogram, Area of Triangle. Volume of the parallelepiped.

**4. Function:****(Periods-06 hrs, Mks-26)**

- 4.1 Value of a function, types of functions.
- 4.2 Limits

## IMPLEMENTATION STRATEGY (PLANNING)

Conducting lectures as per the teaching plan and conducting tutorials.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Coordinate geometry	24	82	50	M
2.	Complex Numbers:	10	32	24	M
3.	Vector Algebra:	08	24	12	E
4.	Function	06	26	14	E
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. Coordinate geometry

### Section II

2. Complex Numbers
3. Vector algebra
4. Function

### Reference Books:

- (1) Mathematics for polytechnic students –I&II, by S.P. Deshpande. (1998, Pune Vidyarthi Graha Prakashan, Pune-30)
- (2) Engg. Mathematics-I & II, by G.V. Kumbhojkar (1999, Jamnadas & Co.)
- (3) Applied Mathematics (1<sup>st</sup> year), by Patel Rawal. (2002, Nirali Prakashan, Mumbai)

**ELECTRONIC DEVICES AND CIRCUITS – II (IT-7)**(One Paper –3 Hrs., Theory 100 Mks, Lect. –4/Week, Pr.– 2/Week, Credit = 6,  
T.W= 50M, Pr.=50 Mks.)**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract. Exam	Total		
EDC – II	4	2	-	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT-7	426	

**Rationale :**

This subject deals with some more sophisticated electronic devices and complex types of circuits and their functions. These devices and circuits are used as functional blocks in their complete systems like analog and digital control and processing system.

**Objectives:**

- (1) Identity the diff. Components & classify them.
- (2) Identity diff. Devices, char., working.
- (3) Appreciate use of diff. Transistors, amplifier, oscillators.
- (4) Design simple circuits using above comp.

**Theory Contents:****Power Amplifier****(Periods-13 hrs, Mks-20)**

Single ended and double ended amplifiers, class A Transformer coupled amplifier, conversion efficiency, harmonic distortion o/p power, push pull amplifiers – class A, B, AB operation, complementary symmetry push pull amplifier, heat sink, problems based on above topics.

**Voltage Tuned Amplifiers****(Periods-04 hrs, Mks-10)**

Need, single tuned and double tuned voltage amplifiers, freq. Response, B.W., Av and selectivity.

**Wide Band Amplifiers****(Periods-04 hrs, Mks-06)**

High and low freq. Compensation, rise time compensation.

**Multivibrators****(Periods-07 hrs, Mks-24)**

Astable, monostable, bistable, stable states, triggering methods, Schmitt trigger.

Applications of Schmitt Trigger, Monostable, astable and Bistable MVs.

**UJT****(Periods-06 hrs, Mks-20)**

Construction, equivalent ckt., V.I. chars, applications of UJT, UJT relaxation oscillator, Frequency stability, UJT data sheet.

**Thyristors.****(Periods-06 hrs, Mks-20)**

Construction, char. And applications of SCR, DIAC, TRIAC, Two tr. Analogy of SCR, rate effect, ratings of above devices.

**FET****(Periods-14 hrs, Mks-48)** Construction and char. of

JFET, effect of temp, JFET parameters, configurations, small signal DET model,

FET biasing, common source and common drain amplifiers, FET applications as V.V.R. in AGC, constant current source etc.

**MOSFET:**

Construction and char. of D-MOSFET and E-MOSFET, VMOS, power MOSFET, data sheet, BJT\_FET, combination n/w's, IGBT, problems based on above topics.

**Photoelectric Devices****(Periods-10 hrs, Mks-16)**

Photoelectric effects, construction and char. of Photodiode, Phototransistor, Phototube, Multiplier Phototube, LED, LCD, Optocoupler, Photovoltaic cell and their applications, Burglar alarm.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Power Amplifier	13	20	15	E
2.	Voltage Tuned Amplifiers	04	10	05	D
3.	Wide Band Amplifiers	04	06	03	D
4.	Multivibrators	07	24	16	E
5.	UJT	06	20	15	M
6.	Thyristors.	06	20	15	M
7.	FET	14	48	24	M
8.	Photoelectric Devices	10	16	07	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. Power Amplifier
2. Voltage Tuned Amplifiers
3. Wide Band Amplifiers
4. Multivibrators
5. UJT

**Section II**

6. Thyristors.
7. FET
8. Photoelectric Devices

**Total Theory Hrs = 64 hrs.**  
**Total Practical Hrs = 32 hrs.**

**List of Experiments:**

- V.I. characteristics of UJT.
- UJT Relaxation Oscillator.
- SCR characteristics.
- TRIAC characteristics
- JFET Characteristics
- MOSFET characteristics
- FET biasing ckts.
- Frequency response of FET amplifier
- Phototube characteristics
- Burglar alarm.
- High frequency compensation for BJT amplifier
- Freq. Response of single stage X' mer coupled amplifier.
- Study of class AB push pull amplifier.
- Freq. Response of double tuned voltage amplifier.
- Study of Astable M.V.
- VCO (symmetrical A.M.V.)
- Bistable M.V.
- Schmitt Trigger.
- Monostable m.v.

**Reference Books:**

- Integrated Elex. by Millman and Halkias
- Microelectronics by Millman
- Electronic Devices and Circuits by Robert Boylestad
- Electronic Devices and Circuits by Allen Mottershed
- Pulse, digital and switching waveforms by Millman & Taub

**Additional References:**

- Thyristors and their Applications by Ramamurthy
- Thyristorised power controllers by Dubey & Doradla
- SCR GEC manual
- Basic Elex. and linear ckts. By Bhargava.

**PROGRAMMING IN C++ (IT - 8)**

(One Paper -3Hrs., Theory:100 Mks , Practical : 50 Mks , T.W. : 50M

Lecture : 3/Week, Practical : 2/Week, Credit :6 )

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination							Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract.	Exam	Total		
Programming in C++	3	2	1		1,3 Hrs., 100 Mks.	20	80	50	50	200			IT-8	326

**Rationale:**

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

**Objectives:**

The Student will be able to :

- Learn the concepts of object oriented technology
- Develop the skill for Programming the object oriented concepts using C++ as the language
- Debug pitfalls of conventional programming methods considering programming features.
- Expertise in Eliminating Redundant Code
- Build Secure Programs
- Apply the techniques of simplifying complex programmes.

**Theory Contents :**

- Principles of Object Oriented Programming (Periods-4hrs. Mks-20)**  
Basic concepts of OOP, Comparison of procedural programming and OOP, Advantages of OOP, OOP Languages, Definitions, Class, objects, Concepts of inheritance and encapsulation, Operator overloading , Dynamic binding Over view of OOP using C++, Basic program construction: main and functions, Program statements, Class declaration , Comments , C++ compilation
- Elements of C++ Language (Periods-6hrs. Mks-20)**  
Tokens and identifiers, Character set and symbols, Keywords, C++ identifiers Variables and constants, Integers & characters, Constants and symbolic constants Dynamic initialisation of variables, Reference variables, Enumerated variables  
Data Types, Basic data types, Arrays and strings, User defined data types, Operators, Arithmetic, relational operators and operator precedence, Logical operators, Manipulators, Type conversions and type cast operators, console I/O : cin, cout functions, Control statements, The if statement I-else; else...if: switch statements, Loops: for and While-do statements, Break, continue, go to
- Functions (Periods-4 hrs. Mks-16)**  
Simple functions, Declaration of functions, Calling functions, Function definition Passing arguments and returning values, Passing constants and variables, Passing by value, Return statement, Void functions, Passing and returning structure variables, Reference variables and arguments, Overloaded functions, Inline functions, Default arguments, Returning by reference
- Classes and objects (Periods-5 hrs. Mks-15)**  
Declaration of classes and objects in C++, Class definition, Declaration of members, Objects as data types, Objects as function arguments, Array of objects, Returning objects form junction, Structures and classes
- Constructors and Destructors (Periods-4 hrs. Mks-15)**

Constructors, Basic constructors, Parameterised constructors, Constructors with default arguments,

Dynamic initialisation of objects , Copy constructors, Use of copy constructor, Shallow copying and deep copying, Dynamic constructors, Destructors, Constraints on constructors and destructors

**6. Operator Overloading**

**(Periods-4 hrs. Mks-20)**

Overloading unary operators, operator keyword, Arguments and return values, Laminations of increment operators, Overloading binary operators, Arithmetic operators, Examples: Addition of polar coordinates and concatenation of strings, Multiple overloading, comparison operators, Arithmetic assignment operators, data and type conversions, Conversion between basic types, Conversion between objects and basic types, Conversion between objects of different classes, Constraints on type conversion

**7. Derived Classes and Inheritance**

**(Periods-5 hrs. Mks-20)**

Derived classes and base class, Defining a derived class, Accessing the base class members, The protected access specifier, Derived class constructors, Overriding the member functions, Class hierarchies, Abstract base class, Constructors and member functions, Inheritance, Public and private inheritance, Access combinations and usage of access specifier, Classes and structures, Multiple inheritance, Member functions in multiple inheritance , Constructors in multiple inheritance, Ambiguity in multiple inheritance

**8. Pointers**

**(Periods-4 hrs. Mks-14)**

Addresses and pointers, The address of operator & Pointer variables, Accessing the variable pointed to, Pointer to void, Pointers and Arrays, Pointers and functions, Passing simple variables, Passing arrays, Pointers and strings, Pointers to string constants, strings as function arguments, Arrays of pointers to strings Memory management using new and delete operators, Pointers to objects, Pointers to pointers

**9. Virtual Functions**

**(Periods-4 hrs. Mks-10)**

Virtual functions and polymorphism, Friend functions, Static functions, Comparison of macros and inline function

**10. Streams**

**(Periods-4 hrs. Mks-04)**

Stream classes, Streams class hierarchy, Header files, Ios flags, Stream manipulators, String streams, Character stream classes, Object I/O, file streams, Disk I/O with member function

**11. Templates**

**(Periods-2 hrs. Mks-05)**

Generic classes and functions, function templates, Class templates

**12. Exception Handling**

**(Periods-2 hrs. Mks-05)**

Use of exception handling, Try block, Catch handler, Throw statement, Exception specification

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage	
				%	# M / E / D
1.	Principles of Object Oriented Programming	04	20	10	D
2.	Elements of C++ Language	06	20	10	E
3.	Functions	04	16	10	E
4.	Classes and objects	05	15	10	M
5.	Constructors and Destructors	04	15	10	E
6.	Operator Overloading	04	20	10	E
7.	Derived Classes and Inheritance	05	20	10	M
8.	Pointers	04	14	10	M
9.	Virtual Functions	04	10	05	E
10.	Streams	04	04	05	E
11.	Templates	02	05	05	E
12.	Exception Handling	02	05	05	E
<b>Total</b>		48	164	100%	#

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. Principles of Object Oriented Programming
2. Elements of C++ Language
3. Functions
4. Classes and objects
5. Constructors and Destructors

**Section II**

6. Operator Overloading
7. Derived Classes and Inheritance
8. Pointers



9. Virtual Functions
10. Streams
11. Templates
12. Exception Handling

**Total Theory Hrs. =4 8 hrs.**

**Total Practical Hrs. = 32 hrs**

**List of Practical : -**

1. Objects and Classes
2. Functions: Private and Public
3. a) Overloaded functions with different number of arguments and different kind of argument.  
b) Inline functions.
4. a) Constructors, Destructors  
Passing objects to and returning from functions.
5. Operator Overloading  
(a)Unary Operator Overloading  
(b)Binary Operator Overloading
- 6.. Inheritance  
(a)Derived & Base Class  
(b)Protected Class Specifier  
(c)Derived Class construction  
(d)Public, Private Inheritance  
(e)Multiple Inheritance
7. Pointers  
Pointers to objects, Memory Management operators.
8. Files in C++, Reading an object from & writing to Disk, File Pointers, Error handling, Command line Arguments.
9. Graphics Functions.
10. Virtual functions, friend function, static functions.

**Reference Books :**

Ronbert Lafore, "Object Oriented Programming in Turbo C++", Galgotia Publication, 1996  
E.Balaguruswamy, "Object Oriented Programming with C++", Tata McGrahill 1997  
Stnely B Lippman, "C++ Primer", Addison Wesley, 1995  
Stastroup, "The Elements of C++ programming", Addison Wesley Publication 1995  
Programming in c++ by Y.I. Shah & M.H. Thaker, AICTE / ISTE / SDC

***Additional References:***

Anthony Rudd, "C++ Complete: A Reference and Tutorial to the proposed ANSI Standard" Wiely-QED Publication 1994.

**PHYSICS (IT-9)**

(One Paper-3 Hrs, Theory 100 Marks., Pract.– 50 Marks, T.W.=50Marks,

Tutorial: 1/Week ,Lecture : 3/Week, Pract.:4/Week, Credit:8)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional	Work Paper	Term work Pract.	Exam	Total		
Physics	3	4	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT-9	348

**Rationale :**

To develop the basic concepts, facts, Principles of scientific phenomena in the field of Physics and material properties and applications. Also it will help to develop the laboratory skill.

**Objectives:**

Students will be able to :

- I. Understand the basic facts about field of Physics viz. mechanics, heat light magnetism and electricity in the area of Physics : Scalars and Vectors, Kinematics, Elasticity, Heat conduction, Prism, Sound and Magnetic field, Electrical current, Resistance, Whetstone's Bridge.
- II. Understand the basic concepts in the area of Physics: Resolution of vectors, Kinematics, Viscosity, Co-efficient of thermal conductivity, Absolute zero, gas equations, simple harmonic equation, sound wave, heating effect, quantum.
- III. Understand the basic Principles of scientific phenomena in Physics: Newton's law of gravitation, Young's modulus, Stokes' law, Boyle's law, Charies' law, GayLussac's law, Newton's formula for velocity Sabine's formula, Coulomb's law, Ohm's law, Joule's law, Bio-Savart's law, specific heat.
- IV. Understand the basic techniques of physical process: Resolutions of vectors, Kinematics, equation of motion under gravity, determination of "Y", viscosity, Co-efficient of expansion of heat, analysis of simple resistance circuit, construction and working of motor.
- V. Understand the importance of above knowledge in the context Core Technology and Technology areas.
- VI. Develop laboratory skill of investigation for use in actual production system.

**Theory Contents :****1. FUNDAMENTALS****(Periods-10 hrs. Mks-36)**

Vectors & scalars, Representation of a Vector, Unit Vector, Triangle law of Vectors, resultant-vector, parallelogram of Vectors, Resolution of Vector, Definition sand significance of scalar product & Vector Product of two vectors  
Definition-Kinematics, displacement, speed velocity and acceleration. Equation of motion with uniform acceleration, velocity time diagram. Newton's law of Gravitation acceleration due to gravity. Motion under gravity, escape velocity. Velocity and period of artificial satellite, communication satellite. Uniform circular motion, Tangential velocity, Relation between linear and angular velocity, radial acceleration, centripetal and centrifugal forces, super elevation of roads and tracks.

**2. GENERAL PHYSICS****(Periods-09 hrs. Mks-30)**

Elastic limit, Hooke's law. Types of deformation, definitions of Bulk, Rigidity and Young's modules, Determination of "Y" by Searle's method, behaviour of a wire under continuously increasing stress, yield point, Breaking stress, Factor of safety. Definition and explanation of viscosity, co-efficient of viscosity, determination of viscosity by Poiseuille's method (Derivation of formula not necessary), Stokes' law (derivation not necessary) viscosity of a liquid by Stokes' law, application of viscosity, critical velocity, Reynolds' number.....

**3. HEAT****(Periods-05 hrs. Mks-16)**

Statement of Boyle's Law, Charle's Law, Gay Lussac's Law, concept of absolute zero. Kelvin scale of temperature general gas equation, gas constant, Universal gas constant, definitions of specific heat of gas at constant pressure and at constant volume. Relation between Cp & Cv, ratio of Cp and Cv, adiabatic and isothermal expansion of gases, isothermal and Adiabatic elasticity of gases. Conduction along a bar, steady state of temperature, Coefficient of expansion

#### 4. OPTICS

(Periods-2 hrs. Mks-07)

formula, spectrometer, Refractive index of prism by spectrometer.

Definition and explanation of linear simple harmonic motion, concept of wave motion, amplitude, frequency, wave length periodic time, phase, relation between velocity of a wave, frequency and wavelength, Transverse wave, Longitudinal wave.

#### 5. SOUND

(Periods-05hrs.,Mks-16)

Sound as a longitudinal wave, equation of a progressive wave, Newton's formula for velocity of sound, Laplace's correction, effect of temperature, pressure and humidity on velocity of sound, resonance tube, application in brief. Echo, Reverberation, Sabine's formula (derivation not necessary), factors affecting reverberation time, acoustical planning of a building. Ultrasonic waves & their application

#### 6. ELECTROSTATICS

(Periods-05 hrs. Mks-16)

Coulomb's inverse square law, unit charge electric field, intensity of electric field, definition and properties of electric lines of force, electric flux, electric flux density relation between flux density and intensity, electric flux due to a given charge. Electric potential, potential difference, difference absolute potential at a point. Capacitance, principle of capacitor, capacitors in series and parallel.

#### 7. CURRENT ELECTRICITY

(Periods-5 hrs. Mks-16)

Ohm's law, resistance, specific resistance, resistance in series and parallel, Theory of shunt, General equation of Ohm's law, Wheatstone's network, Wheatstone's bridge, fall of potential along a uniform wire, potentiometer, comparison of e.m.f. and determination of internal resistance of cell by using potentiometer, effect of temperature on resistance, platinum resistance thermometer. Effect of electric current, Joule's Law, electric power and electricity bills, Seebeck effect, Peltier effect law of intermediate temperatures, law of intermediate metals, measurement of high temperatures by thermocouple. Magnetic effect of electric current, magnetic induction, Biot-savart's Law, Ammeter, Volt meter, Construction and working.

#### 8. MODERN PHYSICS

(Periods-9hrs. Mks-27)

Explanation of Planck's concept of quantum, Energy of quantum (photon), Electron-volt. Characteristics of photo electric effect, Planck-Einstein Equation, Application of Photo-Electric Cell.

Classification of solids into conduction, semiconductors and Insulations, Intrinsic and Extrinsic semiconductors.

X-rays Coolidge tube, continuous x-ray spectrum, minimum wavelength, use of x-rays.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	ELECTRICITY MECHANICS	10	36	24	M
2.	GENERAL PHYSICS	09	30	20	M
3.	HEAT	05	16	08	E
4.	OPTICS	02	07	04	D
5.	SOUND	05	16	08	E
6.	ELECTROSTATICS	05	16	08	E
7.	CURRENT ELECTRICITY	05	16	08	E
8.	MODERN PHYSICS	07	27	20	M
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential,

E=Essential,

D=Desirable)

#### Section I

1. FUNDAMENTALS
2. GENERAL PHYSICS
3. HEAT

#### Section II

4. OPTICS
5. SOUND
6. ELECTROSTATICS
7. CURRENT ELECTRICITY
8. MODERN PHYSICS

**Total Theory Hrs. = 48 Hrs.,**

**Total practical hours = 64 hrs.**

**List of Practicals :**

The experiments to be grouped area as under

**GROUP A (Any 6) :**

1. 1. Use of Vernier callipers and Micrometer screw gauge.
2. 2. Verification of law of parallelogram of forces.
3. 3. Determination of “g” by simple pendulum.
4. 4. Verification of Boyle’s Law.
5. 5. Determination of Surface tension by capillary rise method by using travelling Microscope
6. 6. Determination of Young’s Modulus by Searle’s method.
7. 7. Determination of coefficient of viscosity by Poiseuille’s method.
8. 8. Determination of coefficient of viscosity by Stokes’ method.

**GROUP B (Any 5) :**

9. 9. Determination of coefficient of thermal conductivity of a good conductor by Searle’s method.
10. 10. Determination of coefficient of thermal conductivity of a bad conductor by Lee’s disc method.
11. 11. Measurement of temperature by thermocouple
12. 12. Refractive index of material of the prism by using spectrometer.
13. 13. Determination of Refractive index of prism by minimum deviation – Pin method.
14. 14. Determination of Velocity of sound by Resonance Tube.

**GROUP C (Any 5) :**

15. 15. Determination of specific resistance of material of wire by Voltmeter and Ammeter.
16. 16. Determination of specific resistance of material of wire by metre bridge.
17. 17. Verification of Law of resistances in Series by metre bridge
18. 18. Verification of Law of resistances in parallel by metre bridge
19. 19. Measurement of Temperature coefficient of resistance by Platinum resistance thermometer.
20. 20. To determine electrical equivalent of heat (J) by Joule’s electrical calorimeter

**GROUP D (Any 3) :**

21. 21. Comparison of e.m.f. of two cells by single cell method using potentiometer
22. 22. Comparison of e.m.f. of two cells by sum and difference method using potentiometer.
23. 23. Determination of internal resistance of a cell using potentiometer.
24. 24. Calibration of a voltmeter by potentiometer

A Journal should contain minimum 19 experiments. Internal examiner will assess it by continuous assessment.

**Reference Books :**

1. Applied Physics for Polytechnic by B.G. Dhande.
2. Applied Physics by B.G. Bhandarkar.
- 3.

**Additional References:**

4. Applied Physics by Umrani, Joshi and Deshpande.

**DEVELOPMENT OF GENERIC SKILLS (IT-10)**

(One Paper-3 hrs., Theory : 100 Marks., Lecture : 2/Week, Tutorial : 1/Week, Credit : 3)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.	
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term	work Pract.			Exam
<b>Development of Generic skill</b>	2	-		1	1,3 Hrs., 100 Mks.	20	80	-	-		100	<b>IT-10</b>	303

**Rationale :**

The skills of project management have become important in all types of business and at all levels of work hierarchy. The purpose of development of generic skills is to develop the necessary skills, which will make students confident and competent in managing and executing engineering projects.

**Objectives :**

Over a period of time, it has been observed that effectively of polytechnic students, their utility at work place can be enhanced by imparting generic skills right from entry in the polytechnic. The generic skills are life skills, they are life long skills, whose edge needs to be sharpened every moment.

The content is divided into four logical units :

1. Information
2. Communication skills
3. Self development
4. Task-Management

It is designed by keeping self in focus with a clear objective of developing Generic skills, to enhance the capabilities in the fields of searching, assimilating and using information on job. Developing self and managing given tasks, finally to present himself as a technomanger.

It is an effort to develop student that enables him to be successful in finding a practical and reaction solution to any problem he comes across. It covers more or less all aspects of life skills. The development of subject is progressively ascending parallel to development of study in polytechnic.

**Theory Contents :****1. INFORMATION SOURCES****(Periods-02 hrs. Mks-10)**

Introduction, Types of Information Sources, Print media, Documentary sources, Non-Documentary sources, Non-print media, Electronic media, Conclusion .

**2. INFORMATION CENTRE****(Periods-02 hrs. Mks-10)**

Introduction, Classification, Services, Conclusion.

**3. PROCEDURE FOR INFORMATION SEARCH****(Periods-04 hrs. Mks-20)**

Introduction, Need of approach, Types of approach, Steps for Information search, Preparation of biographic card, Preparation of index card, Conclusion .

**4. LEARNING****(Periods-04hrs. Mks-20)**

Introduction, Concept of learning, Basic model of learning, Principles of learning, Conclusion .

**5. MEMORY & COGNITION****(Periods- 04hrs. Mks-20)**

Introduction, Basic concepts, Dual store model of memory, Sensory register characteristics , Attention : Factors affecting attention, Figure ground rule, Working memory (WM) : Characteristics of WM, Control processes in WM, Long term memory (LTM) : Characteristics of LTM, Control processes in LTM, Organization of Knowledge, Conclusion.

**6. META COGNITION & STUDY STRATEFIES****(Periods- 04hrs. Mks-20)**

Introduction, Meta cognitive knowledge & skills, Self regulated learning, Effective learning & study strategies (Covert) : Selective attention, Maintain Rehearsal, Meaningful learning reflection, Internal organization, Elaborative ----\*\* Visualization, Effective overt learning strategies : Effective reading, Effective listening, Notes taking, Conclusion.

**7. LEARNING ON JOB****(Periods-04 hrs. Mks-20)**

Introduction, Definition, Identifying general and specific skills, Workplace as a system, Types of system, Conclusion.

**8. LEARNING PRACTICAL SKILLS****(Periods-02 hrs. Mks-10)**

Introduction, Process of performing the job, Domains of learning job, Conclusion .

**9. TESTING OF ACQUIRED SKILLS****(Periods-02 hrs. Mks-10)**

Introduction, Objectives, Process for skill analysis, Conclusion .

**Unit - II COMMUNICATION SKILLS****10. BASIC OF COMMUNICATION****(Periods-02 hrs. Mks-10)**

Definition, Concept of communication, Communication cycle, Communication, Conclusion .

**11. TECHNIQUES OF COMMUNICATIONS****(Periods-02 hrs. Mks-14)**

Introduction, Oral communication, Written communication, Body language, Conclusion.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	INFORMATION SOURCES	02	10	07	E
2.	INFORMATION CENTRE	02	10	07	E
3.	PROCEDURE FOR INFORMATION SEARCH	04	20	11	M
4.	LEARNING	04	20	11	M
5.	MEMORY & COGNITION	04	20	12	M
6.	META COGNITION & STUDY STRATEFIES	04	20	12	D
7.	LEARNING ON JOB	04	20	12	E
8.	LEARNING PRACTICAL SKILLS	02	10	07	E
9.	TESTING OF ACQUIRED SKILLS	02	10	07	D
10.	BASIC OF COMMUNICATION	02	10	07	E
11.	TECHNIQUES OF COMMUNICATIONS	02	14	07	E
<b>Total</b>		<b>32</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. INFORMATION SOURCES
2. INFORMATION CENTRE
3. PROCEDURE FOR INFORMATION SEARCH
4. LEARNING
5. MEMORY & COGNITION

**Section II**

6. META COGNITION & STUDY STRATEFIES
7. LEARNING ON JOB
8. LEARNING PRACTICAL SKILLS
9. TESTING OF ACQUIRED SKILLS
10. BASIC OF COMMUNICATION
11. TECHNIQUES OF COMMUNICATIONS

**Total Theory Hours : 32 Hrs.****Reference Books :**

Learning to learn by Kenneth A. Kiewra  
 Independent study techniques by P.D. Kulkarni & B. B. Sharma

**Additional References :**

101 ways to better communication by Elizabeth Hienny.

Shri Vile Parle Kelavani Mandal's

**SHRI BHAGUBHAI MAFATLAL POLITECHNIC**

III<sup>rd</sup> Semester (Diploma in Information Technology)

w. e. f. Batch admitted in July, 2008

Sr. No	Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.	
		Lecture	Pract. or Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total			
1.	Digital Electronics	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT - 11	326	
2.	System Programming	3	2	1	1,3 Hrs., 100 Mks.	20	80	25	50	175	IT - 12	326	
3.	DBMS	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT - 13	326	
4.	Numerical Analysis	4	2	1	1,3 Hrs., 100 Mks.	20	80	25	25 (oral)	150	IT - 14	426	
5.	Elements of Computer Engg.	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	50	175	IT - 15	426	
6.	Software Engg.	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	50	175	IT - 16	426	
Total		21	12	4	6 Papers	--	--	--	--	1075			
Total Periods: 37						Total Marks: 1075							

**Lecture / Tutorial / Practical = 1 Hour**

Note:

1. Sessional is to be accessed by Internal Examiner
2. Theory & practical is to be accessed by Internal Examiner & External Examiner combined.
3. Term work is to be accessed by Internal Examiner & External Examiner as per the ratio.
4. There will be three periodical test of 25 Marks for each subject. Best of two periodical test marks will be considered as a sessional of 20 % weightage.
5. Final term end examination will be of 100 marks having weightage of 80%

**DIGITAL ELECTRONICS (IT-11)**

(One Paper- 3 Hrs, Theory Marks: 100, Lect.= 3 hrs/Week, Pract=2/Week,

Tutorial : 1/Week, Credit : 6 , Pract. Marks: 50, TW=50marks)

Teaching And Examination Scheme :

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work	Paper	Term work	Pract.	Exam		
Digital Electronics	3	2	1		1,3 Hrs., 100 Mks.	20	80	50	50	200	IT - 11	326	

**Rationale:**

This subject will help the students to learn facts, Concepts, principals and procedures of digital electronics. These techniques can be used for designing sequential and combinational circuits which forms the basis of any electronic device.

**Objectives**

The course is designed in such a manner that students will be knowing the basic Boolean algebra along with implementation of the function using logic gates.

The course covers advanced logic families in & grater depth.

The course gives a detail introduction to sequential & combinational circuits, which form a basic for hardware subjects.

**Theory Contents :****1. Number systems and Code****(Period-8 Hrs,Mks-20)**

Introduction to number systems, binary No. Systems, binary arithmetic (addition, subtraction, multiplication, division) Octal No. System, Hexadecimal System, 1's complement & 2's complement method of subtraction signed number

Codes: Excess – 3 and grey code.

Alphanumeric Codes: Extended BCD Interchange code (EBC-DIC), ASCII code, 12 bit Hollerith Code, Error Detection

Codes: Parity, 7 – bit hamming code.

**2. Combinational Logic Design****(Period-7 Hrs,Mks-24)**

Boolean Algebra – Concept of AND OR. NOT operators. Evaluation of logic expression, Basic laws of simplification Demorgan's theorems. Mean terms & max term representatives of logical functions K-map representations of logical functions and minimisation using K-map. Don't care conditions, Examples, Binary half & full adder, subtractor, BCD to 7 segment decoder, binary to Grey & Grey to Binary code converter.

**3. Logic Families****(Period-6 Hrs,Mks-20)**

TTL, ECL, ITL MOS, CMOS, etc., Review or logic analysis of basic circuits in these families, open collector and tri state logic, Input & O/P parameters. Noise margin, Fan-out and Fan-in, speed, power deviation

**4. MSI Circuits****(Period-7 Hrs,Mks-24)**



Multiplexers and their use in combinational logic design, cascading of demultiplexers, introduction to general purpose 74 series Multiplexers IC's Demultiplexers or Decoders and their use in combinational logic design, cascading of demultiplexers, introduction to general purpose 74 series Demultiplexers, binary and BCD address digital comparators. BCD to seven segment decoder/drivers. Study of ALU 74181.

5. **Flip-Flops** **(Period-6 Hrs,Mks-24)**  
A 1-bit memory cell, clocked SR, JK, MSJK, D Type Flip Flop, T type Flip Flop. Applications of Flip Flop-counter, registers, memory.
6. **Sequential Logic Design** **(Period-5 Hrs,Mks-20)**  
Introduction to Registers Shift registers, universal registers, Application to registers from various shift operation, Ring counter, Johnson counter.
7. **Study of Timer (555)** **(Period-4 Hrs,Mks-16)**  
Study of timer(555) and it's applications, Schmitt trigger and various modes
8. **Semiconductor Memories** **(Period-5Hrs,Mks-16)**  
Introduction, Memory organisation and operation, Introduction to different types of memories as ROM, EPROM, RAM (static & dynamic)

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D	
1.	Number systems and Code	08	20	13	E	
2.	Combinational Logic Design	07	24	15	M	
3.	Logic Families	06	20	13	M	
4.	MSI Circuits	07	24	15	M	
5.	Flip-Flops	06	24	15	M	
6.	Sequential Logic Design	05	20	13	D	
7.	Study of Timer (555)	04	16	08	E	
8.	Semiconductor Memories	05	16	08	D	
		<b>Total</b>	<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Number systems and Code
2. Combinational Logic Design
3. Logic Families
4. MSI Circuits

#### Section II

5. Flip-Flops
6. Sequential Logic Design
7. Study of Timer (555)
8. Semiconductor Memories

**Total Theory Hours : 48 Hrs.**

**Total Practicals Hours : 32hrs**

#### List of practicals

1. Study of logic gates & verification of Demorgan's Theorems.
2. Demultiplexers Decoders, multiplexer (digital)
3. Study of Astable monostable bistable Multivibrators using logic gates.
4. SR,JK, T & D flip flop in logic gates
5. Ripple counter using JK flip flops.
6. Decade counter 7490
7. Synchronous counter using JK flip flops
8. Shift register using D flip flops
9. Monoshot IC's like 74121, 74123, 74221
10. Presentable shift right, shift left registers

11. Counter with multiplexed display example 740926, 925,927
12. Up down counter
13. Mod N Counter using JK flip flop
14. Full adder – subtractors using IC 7483
15. Study of BCD adder
16. Study of BCD to 7 segment decoder, BCD to decimal
17. Unidirectional buffer IC 74LS244, Bidirectional 74LS245 buffers.
18. Buffer latches – 74LS373, 74LS374, 8212
19. Decimal to BCD encoder
20. Analog Demultiplexer and Decoders
21. Analog to digital converter (any one type)
22. Digital to analog converter (any one type)
23. 7 to DPM.
24. Study of 8116 RAM.

**Reference books:**

Digital Principles – Malvino & Leach

Digital computer fundamental – T.C. Bartee

Digital electronics – R.P. Jain

***Additional References:***

TTI CMOS data handbook,

Reference manual for application circuit.

**SYSTEM PROGRAMMING (IT-12)**

(One Paper - 3 Hrs., Theory : 100 Marks, Lect : 3/Week, Prac : 2/Week,  
Tutorial: 1/W, Credit: 6, T.W.: 25Marks, Practical : 50 Marks.)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work	Paper	Term work	Pract.	Exam		
System Programming	3	2	1		1,3 Hrs., 100 Mks.	20	80	25	50	175	IT - 12	326	

**Rationale:**

This course is intended to give an insight to the software required to utilise the hardware resources. It gives an important migration path to the students from Data Structures to finally using Data Structure for Software and Applications.

**Objectives:**

This course is intended to give an insight to the software used to utilise the hardware resources. It gives an important migration path to the students from Data Structures to finally using Data Structure for Software and Applications.

**Theory Contents :****1. Component of a programming system :****(Periods-06hrs.,Mks-28)**

Assemblers, Loaders, macros, Compilers, Formal system, Evolution of operation system, operating system functions and facilities

**2. General machine structure****(Periods-10 hrs. Mks-34)**

For a typical Von-nauman, machine such as IBM 360/370 formats (RX, RR, SS, SI) and types of data and instruction, Instructions in Load, Store, Add, Subtract, Compare, Multiply, divide and shift groups for IBM 360/370, Machine language and Assembly language programs, Assembler directives and pseudo-kopns.

**3. Assembler****(Periods-10hrs. Mks-29)**

General design procedures, The detail design procedures of a two pass Assembler.

**Data Structures:**

Searching methods : Linear search and binary search, sorting methods : Interchange sort (bubble sort), shell sort, bucket sort, Radix Exchange sort, Address calculation sort, Hash or random entry searching Macro processors : Macro instruction, features of macro facility and implementation with a two pass assembler.

**4. Loaders****(Periods-08 hrs. Mks-30)**

“Compile-and Go” loaders, General loader scheme, Absolute loaders, Relocating loaders, Design of an absolute loaders. Other loader scheme : Binder linkage editor overlay structure, Dynamic loading, Dynamic linking.

**5. Higher level Language****(Periods-06 hrs. Mks-18)**

Importance of HLL, Features of HLL, Extensive data types and instructions, storage llocation, Accessing flexibility, Functional modularity and asynchronous operation.

**6. Compilers****(Periods-08 hrs. Mks-25)**

General model of a compiler phases of a compiler, Lexical phase, syntax phase Interpretation phase optimisation, storage assignment, and Code generation assembly phase.

**Total Theory Hrs.= 48 hrs****Total Practical Hrs.= 32 hrs.**

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Component of a programming system :	06	28	15	E
2.	General machine structure	10	34	25	M
3.	Assembler	10	29	25	M
4.	Loaders	08	30	13	E
5.	Higher level Language	06	18	09	D
6.	Compilers	08	25	13	E
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Component of a programming system
2. General machine structure
3. Assembler

#### Section II

4. Loaders
5. Higher level Language
6. Compilers

**Total Theory Hrs.= 48 hrs**

**Total Practical Hrs.= 32 hrs.**

#### List of Practicals :

To design assembler using 'C' lang.

#### Reference Books :

System programming by John. J Donovan (McGraw Hill)  
Introduction to system software by D.M. Dhamdhere.

#### Additional References:

Principals of Compiler Construction by Aho Ullman.

Operating System by John J Donovan & Mandrik

**DATA BASE MANAGEMENT SYSTEM (IT-13)**

(One paper-3 hrs, Theory : 100 Marks., Lecture : 3/Week, Pract. : 2/Week,

Tutorial : 1/Week, T.W. : 50Marks, Pract. : 50Marks , Credit : 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.		Tutorial	Sessional	Work	Paper	Term work	Pract.		
DBMS	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT – 13	326	

**Rationale :**

The aim of this subject is to get broad understanding of the basic concepts of database system in general and relational database system in particular. The students will have theoretical foundation required for working with different types of relational database products, such as SQL.

**Objectives :**

The student will be able to:

- Learn the concept of database
- Familiarize the different data models.
- Create applications using available database packages.

**Theory Contents :**

- |   |                          |
|---|--------------------------|
| 1. Data independence, data models, Network Model, DBTG proposal         | (Periods-05 hrs. Mks-18) |
| 2. Data definitions and Data Manipulation languages                     | (Periods-04 hrs. Mks-18) |
| 3. Hierarchical and Relational models                                   | (Periods-07 hrs. Mks-26) |
| 4. Storage Organisation for relations                                   | (Periods-07 hrs. Mks-24) |
| 5. Relational query languages, query processor and optimiser            | (Periods-10 hrs. Mks-28) |
| 6. Functional dependencies, normal forms, multivalued Dependencies      | (Periods-08 hrs. Mks-24) |
| 7. Decomposition, integrity, protection, security concurrency, Recovery | (Periods-07 hrs. Mks-26) |

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Data independence, data models, Network Model, DBTG proposal	05	18	06	E
2.	Data definitions and Data Manipulation languages	04	18	06	D
3.	Hierarchical and Relational models	07	26	18	M
4.	Storage Organisation for relations	07	24	15	D
5.	Relational query languages, query processor and optimiser	10	28	20	M
6.	Functional dependencies, normal forms,	08	24	15	M

multivalued Dependencies

7. Decomposition, integrity, protection, security concurrency, Recovery	07	26	20	E
<b>Total</b>	<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. Data independence, data models, Network Model, DBTG proposal
2. Data definitions and Data Manipulation languages
3. Hierarchical and Relational models
4. Storage Organisation for relations

### Section II

5. Relational query languages, query processor and optimiser
6. Functional dependencies, normal forms, multivalued Dependencies
7. Decomposition, integrity, protection, security concurrency, Recovery

**Total Theory Hours = 48 hrs.**

**Total practical Hours = 32 hrs**

### List of Practicals :

1. Building a database
2. Checking various query commands available.
3. Sorting/Indexing databases-Update of databases
4. Program with general procedures for :
  - a. The maintenance of databases
  - b. Processing of databases.

### Reference Books :

1. Principles of Database Management, by James Martin
2. An Introduction to Database systems by date C.J. Volumes I & II, Addison-Wesley, 1981, 1983
3. Understanding Dbase III by Simpson, A BPN Publications, Delhi
4. Data Base system Engineering by Whittington R.P., Calvender Press
5. Database Systems Management and Design by Pratt. P. Boyd and Frasser Publ. Comp. 1987.
6. Database Processing: Fundamentals, Design, Implementation by Kroenke, D.M. 2<sup>nd</sup> Edn., Galgotia Publ. Pvt. Ltd.

### Additional References:

1. Database Design by Wiederhold, (McGraw Hill Book Comp.)
2. Dbase III Plus made systematic by Shah Y.I., Jeevan Deep Prakashan.

**NUMERICAL ANALYSIS (IT-14)**

(One Paper-3hrs, Theory - 100 Marks, Lectures : 4/Week, Pract. : 2/Week,

Tutorial : 1/Week, Oral= 25 Marks, T.W. : 25M, Credit :6.)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract. Exam	Total		
Numerical Analysis	4	2	1	1,3 Hrs., 100 Mks.	20	80	25	25	150		IT – 14	426

**Rationale :**

The aim of this subject is to analyse the complex calculations, discretization errors and provides adequate checks on the accuracy

**Objectives :**

The student will be able to :

1. Analyze the calculations with maximum precision.
2. Estimate the magnitude of the round-off and discretization errors.
3. Determine the appropriate step size or the number of iterations required.
4. Provide adequate checks on the accuracy.

**Theory Contents :****1. Floating –point numbers : (Periods-5 hrs. Mks-12)**

Floating – point computation; machine epsilon; Sources of errors; ill-posed and well posed problems; Instability of certain algorithms.

**2. Polynomials interpolation : (Periods-10hrs. Mks-25)**

Divided and finite differences ; Lagrange and Newton's interpolating polynomials; Hermite interpolation; piecewise and Cubic Spline interpolation; error analysis.

**3. Approximation : (Periods-8 hrs. Mks-20)**

Orthogonal Polynomials; Least square and Chebyshev approximation; Curve fitting.

**4. Numerical differentiation and integration methods : (Periods-9 hrs. Mks-25)**

Richardson extrapolation; Newton-Cotes and Gaussian quadrature methods; Romberg integration.

**5. Direct and Iteratives methods for Solution of Linear System of equation :****(Periods-10 hrs. Mks-27)**

Gauss-elimination; method; Gauss-Jordan method; Triangularization method; Gauss-jacobi; Gauss-seidel and SOR method; Convergence of these method.

**6) Eigen values and Eigen vectors : (Periods-10 hrs. Mks-25)**

Rutishauser method for arbitrary matrices; jacobis method for symmetric matrix; power method; inverse power method.

**7) Solution of system of Non-Linear Equations : (Periods-12 hrs. Mks-30)**

Numerical method for first order initial value problem – Taylor series method, Range-Kutta method; multisteps methods; stability and convergence; Two-point boundary value problems.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage	
				%	# M / E / D
1.	Floating –point numbers	05	12	07	E
2.	Polynomials interpolation	10	25	13	E
3.	Approximation :	08	20	11	D
4.	Numerical differentiation and integration methods	09	25	13	E

5.	Direct and Iteratives methods for Solution of Linear System of equation	10	27	17	M
6.	Eigen values and Eigen vectors	10	25	13	E
7.	Solution of system of Non-Linear Equations	12	30	24	M
	<b>Total</b>	<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. Floating –point numbers
2. Polynomials interpolation
3. Approximation :
4. Numerical differentiation and integration methods

### Section II

5. Direct and Iteratives methods for Solution of Linear System of equation
6. Eigen values and Eigen vectors
7. Solution of system of

#### Non-Linear Equations

**Total Theory hours = 64 hrs.**

**Total Practicals = 32 hrs**

#### List of Practicals :

Solving problems for all the methods of Numerical Analysis on Computer using algorithms in C' Language.

1. Program to find a real root of  $F(X) = 0$  by Bisection method.
2. To find a real root of  $F(X) = 0$  by Regular Falsi method.
3. program to find a real root of  $F(X) = 0$  by Newton Raphson method.
4. Solution of a system of linear equation  $AX=b$ , using Gauss Elimination method.
5. Program to find the solution of linear system of equations using LU decomposition method.
6. Program to solve a system of linear equations  $AX=b$  using Gauss-seidel Iteration method.
7. Program to find the largest eigen value in magnitude & its corresponding eigen vector using power method.
8. Lagrange interpolation.
9. Program for interpolation in uniformly spaced table using Newton Gregory formula.
10. Program to evaluate the integral of  $F(X)$  between the limits A & B by composite Trapezoidal rule.
11. Program to evaluate the integral of  $F(X)$  between the limits A & B by composite simson integration rule.
12. Program to compute the solution of  $dy/dx = F(X,Y)$ ,  $Y(X_0) = Y_0$  using the classical Runge-Kutta method.

#### Reference Books :

1. Numerical methods : Problems & solution by M.K.Jain, S.R.K.iyenger, R.K.Jain.
2. Introductory methods of Numercial Analysis by S.S. Sastry.
3. Numercial methods and software by Kahaner, Moler and Nash prentice-Hall (1989)

#### Additional References:

1. Elementary Numerical Analysis : An Alogrithmic Approach – Mc Graw Hill, New York (1980)
2. A.Ralston and P. Rabinowitz- Mc Graw-Hill (1978)
3. Introduction to Numerical Analysis by C.E. Froberg, Addison – Wesley (1969).



**ELEMENTS OF COMPUTER ENGINEERING (IT-15)**

(One paper-3 hrs, Theory - 100 Marks, Lectures - 4/Week, Pract. - 2/Week,

T.W.- 25Marks, Pract. – 50Marks, Credit : 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work Paper	Term work Pract.	Exam	Total		
Elements of Computer Engg.	4	2	-		1,3 Hrs., 100 Mks.	20	80	25	50	175	IT – 15	426

**Rationale:**

The students after studying this subject will be able to understand the architecture and maintenance of computer system. They will understand hardware development, processors and control design of computer systems. This will develop the basic insight in student about the change in the hardware technology, technology design and thereby develop better knowledge for the maintenance and repairing of the computer system. They will also be able to learn how to plan for establishing a computer setup for an given requirement.

**Objectives:**

The students after studying this subject will be able to

1. Understand the architecture and maintenance of computer system.
2. Understand hardware developmental, processor and control design of computer systems.
3. Develop the basic insight in student about the change in the hardware technology
4. Develop better knowledge for the maintenance and repairing of the computer system.
5. Learn how to plan for establishing a computer setup for any given requirement.

**Theory Contents :****1 Introduction of computers :****(Periods-4 hrs. Mks-19)****1.1**

- The mechanical Era
- Electronic computers
- The later generations

**1.2 The VLSI Era :**

- Integrated circuits
- Processor Architecture
- System Architecture

**2 DESIGN METHODOLOGY :****(Periods-6 hrs. Mks-20)****2.1 System Design**

- System Representation
- Design process
- The Gate level

**2.2 The Register level**

- Register level components
- Programmable logic Design
- Resister level design

**2.3 The processor level**

- Processor level components
- Processor level Design

**3 PROCESSOR DESIGN****(Periods-15 hrs. Mks-25)**

### 3.1 Introduction

- Processor Organisation
- Information representation

### 3.2 Instruction sets

- Instruction format
- Instruction types

### 3.3 Fixed Point Arithmetic

- Addition, subtraction, Multiplication, Division

### 3.4 ALU Design

- Basic ALU Organisation
- Floating Point Arithmetic
- Arithmetic processors
- Pipeline processing

## 4 CONTROL DESIGN

(Periods-10 hrs. Mks-20)

### 4.1 Introduction

- Instruction sequencing
- Instruction Interpretation

### 4.2 Hardwired control

- Design Methods
- Multiplier control

### 4.3 Micro programmed control

- Control Memory
- Multiplier control unit
- CPU control unit

## 5. MEMORY ORGANIZATION

(Periods-10 hrs. Mks-30)

### 5.1 Memory Technology

#### 5.1.1 Memory Device Characteristics

#### 5.1.2 Random – Access Memories

#### 5.1.3 Serial – Access Memories

### 5.2 Virtual memory

#### 5.2.1 Memory Hierarchies

#### 5.2.2 Main – Memory allocation

#### 5.2.3 Segments, pages & files

### 5.3 High – speed memories

#### 5.2.4 Interleaved memories

#### 5.2.5 Caches

#### 5.2.6 Associative memories

## 6 SYSTEM ORGANIZATION

(Periods-10 hrs. Mks-30)

### 6.1 Buses.

### 6.2 Arbitration

### 6.3 I/O systems

### 6.4 DMA & Interrupts.

## 7 PARALLEL PROCESSING

(Periods-9 hrs. Mks-20)

### 7.1 Basic Concepts.

#### 7.1.1 Introduction

#### 7.1.2 Types of parallel processors

#### 7.1.3 Performance considerations

#### 7.2 Pipeline processors

#### 7.2.1 Introduction

#### 7.2.2 Pipeline structures

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Introduction of computers	04	19	06	D
2.	DESIGN METHODOLOGY	06	20	14	E
3.	PROCESSOR DESIGN	15	25	16	E
4.	CONTROL DESIGN	10	20	14	E
5.	MEMORY ORGANIZATION	10	30	18	M
6.	SYSTEM ORGANIZATION	10	30	18	M
7.	PARALLEL PROCESSING	09	20	14	E

**Total 64 164 100% #**

**(# M=Most Essential, E=Essential, D=Desirable)**

**Section I**

1. Introduction of computers
2. DESIGN METHODOLOGY
3. PROCESSOR DESIGN
4. CONTROL DESIGN

**Section II**

5. MEMORY ORGANIZATION
6. SYSTEM ORGANIZATION
7. PARALLEL PROCESSING

**Total Theory Hours = 64 hrs**

**Total practical Hours = 32 hrs**

**List of practical:**

- 1)Study of Gates.
- 2)Study of Encoder/Decoder(e.g. parity).
- 3)Study of flipflops,RS,D,Master,slave.
- 4)Study of Counters (Asynchronous & Synchronous,Up & Down Counters etc.).
- 5)Study of ALU.
- 6)Study of registers (their modes of operation i.e. SISO,SIPO,PISO,PIPO)
- 7)Microprocessor programming (atleast 5 programs to be done)Programs like addition of two 8-bit nos,two 16-bit nos.,subtraction,division,multiplication.

**Reference Books :**

- 1)Computer Architecture and Organization by J.P.Hayes  
Tata McGraw Hill Publications New Delhi
- 2)Computer Architecture and Organization By S.G.Zaki  
Tata McGraw Hill Publications New Delhi

**Additional References :**

- Computer System Architecture by M. M. Mano, Prentice Hall of India.  
Computer Organization by Y. I. Shah.

**SOFTWARE ENGINEERING (IT-16)**

(One paper – 3 hrs, Theory - 100 Mks.,Lecture - 4hrs/Week, Pract. : 2/Week,

T.W. - 25Marks, Pract. : 50 Marks, Credit : 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract.	Exam		
Software Engg.	4	2	-		1,3 Hrs., 100 Mks.	20	80	25	50	175		IT – 16	426

**Rationale:**

This subject intends to teach the student the basic fundamentals of Software Engineering. It includes system analysis, designing, coding and programming, role of case tools, Turbo Analyst, prototyping

**Objectives:**

The students will able to :

1. Analyse the system.
2. Design the system.
3. Learn the CASE technology.

**Theory Contents :****1. Software Engineering Fundamentals :****(Periods- 5 hrs. Mks-15)**

Definition of software products, software development paradigms, software engineering, knowledge engineering and end user development approaches.

**2. System Analysis :****(Periods- 8 hrs. Mks-22)**

Abstraction, partitioning and projection, system specification (SRS) standards, formal specification method, specification tools, flow based, data based and object oriented analysis.

**3. System Design :****(Periods-8 hrs. Mks-20)**

Idealized and constrained design, process oriented design (Gane and sarson and yourdon notations), Data oriented design (Warnier-Orr, E-R modelling), object oriented design (Booch approach), cohesion and coupling, Design metrics, Design documentation standards.

**4. Coding and programming :****(Periods-7 hrs. Mks-15)**

Choice of programming languages, mixed language programming and call semantics, Re-engineering legacy system, coding standards.

**5. Introduction to Case Tools Turbo Analyst :****(Periods- 6 hrs. Mks-15)**

Features, Central Data Dictionary, Turbo Analyst Entities.

**6. Role of CASE TOOLS:****(Periods-5 hrs. Mks-15)**

Relevance of CASE TOOLS, High end and low end case tools, Automated support for data dictionaries, data flow diagrams, entity relationship diagrams.

**7. Diagramming :****(Periods-10 hrs. Mks-27)**

General Diagramming Interaction: creating a new/opening an existing diagram, saving, closing, printing the diagrams, exiting from diagramming modules.

Diagram specific description: Presentation diagrams, Decomposition diagrams, Data flow diagrams, Entity relationship diagram, Structure chart.

**8. Software Quality and Testing :****(Periods- 8 hrs. Mks-24)**

Software quality assurance, types of software testing (white box, black box, unit, integration, validation, system etc.) Debugging and reliability/analysis, program complexity analysis, software quality and metrics, software maturity model and extensions.

**9. Prototyping :****(Periods- 7 hrs. Mks-11)**

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Software Engineering Fundamentals	05	15	08	E
2.	System Analysis	08	22	14	M
3.	System Design	08	20	12	M
4.	Coding and programming	07	15	08	D
5.	Introduction to Case Tools, Turbo Analyst	06	15	08	E
6.	Role of CASE TOOLS	05	15	08	E
7.	Diagramming	10	27	20	M
8.	Software Quality and Testing	08	24	16	E
9.	Prototyping	07	11	06	D
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Software Engineering Fundamentals
2. System Analysis
3. System Design
4. Coding and programming
5. Introduction to Case Tools Turbo Analyst
6. Role of CASE TOOLS

#### Section II

7. Diagramming
8. Software Quality and Testing
9. Prototyping :
10. Software project Management

**Total Theory Hours. = 64 hrs.**

**Total Practicals Hours = 32 hrs.**

#### List of Practicals :

1. Draw flowchart.
2. Draw Data Flow Diagrams (DFD)
3. Draw Entity Relationship Diagrams (E-R Diagram)
4. Draw structure charts
5. Create Forms
6. Create Reports

#### Reference Books :

1. Software Engineering :  
A practitioners Approach by Pressman Roger, Tata Mc Graw Hill : New Delhi, 1991
2. An Integrated Approach to software Engineering by Jalota Pankaj, Narosa , Publication, New Delhi, 1991.

#### Additional References :

1. Turbo Analyst Manual (Case solution for productivity & Quality)

#### Reference Website:

<http://www.rspa.com>

**Shri Vile Parle Kelavani Mandal's**  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**  
**IV<sup>th</sup> Semester (Diploma in Information Technology)**

w. e. f. Batch admitted in June, 2008

Sr. No	Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
		Lecture	Pract. or Drg.	Tutorial			Sessional Work	Paper	Term work	Pract. Exam	Total		
1.	Data Structure	4	2	-	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT- 17	426	
2.	Computer peripheral Devices	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	IT- 18	426	
3.	Communication System	4	2	1	1,3 Hrs., 100 Mks.	20	80	50	50 (Oral)	200	IT- 19	427	
4.	Fundamentals of Operating System	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	IT- 36	426	
5.	Visual Basic	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	50	175	IT- 21	426	
6.	Open Source Technology	1	2	1	.	20	--	25	50	95	IT- 43	134	
7.	Industrial Tour	-	-	-	-	-	-	-	-	-	-	00	
Total		21	12	2	5 Paper	--	--	--	--	1020			
Total Periods: 35						Total Marks: 1020							

**Lecture / Tutorial / Practical = 1 Hour**

Note:

1. Sessional is to be accessed by Internal Examiner
2. Theory & practical is to be accessed by Internal Examiner & External Examiner combined.
3. Term work is to be accessed by Internal Examiner & External Examiner as per the ratio.
4. There will be three periodical test of 25 Marks for each subject. Best of two periodical test marks will be considered as a sessional of 20 % weightage.
5. Final term end examination will be of 100 marks having weightage of 80%

**DATA STRUCTURE (IT-17)**

(One Paper - 3 Hrs., Theory Marks: 100, Lect.4/Week, Pract. 2/Week,

T/W : 50Marks, Pract. : 50Marks, Credit :6)

Teaching And Examination Scheme :

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional	Work	Paper	term work	Pract.	Exam		
Data Structure	4	2	-	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT- 17	426	

**Rationale:**

This subject intends to teach the students how to implement the algorithms. After learning this subject the student can able to solve any critical problem through programming.

**Objectives:**

- To study data structure and their application
- This subject will help the students to use the data structure in Pascal programming
- The data structure is the main construct of any programming language so students should study it.

**Theory Contents :**

- Introduction to data structure and classification** (Periods-8 hrs. Mks-13)
- Linear data structure & their sequential storage representation storage structure for arrays. Definition & concept & operation application of stack recursion stack machines, Queues simulation priority queue.** (Periods-8hrs. Mks-24)
- Linear data structure and their linked storage representation:** (Periods- 10hrs. Mks-24)  
pointer & linked allocation linked lineate lists, operation on liner list using singly linked list,. Doubly linked list, Application of linear linked list, Polynomial manipulation, linked dictionary, multiple precision arithmetic, Associative list.
- Nonlinear data structure** (Periods- 8hrs. Mks-24)  
Trees, definition and concept, operation on binary trees, storage representation & manipulation of binary trees, Linked storage representation of binary trees.
- Graphs and their representation** (Periods-10 hrs. Mks-24)  
Matrix representation of graphs, list structure, other representation of graphs, Breadth first search & depth first search
- Sorting and Searching** (Periods-10 hrs. Mks-20)  
Sorting : Other notations & concept, Selection sort, Merge sorting tree sort partition – exchange sort, radix sort. Address calculation sort. Searching :Sequential searching Binary searching, Search trees, High balance trees, weight balanced trees, trees structure.
- Files Structure** (Periods- 6 hrs. Mks-20)  
Definition and concept record organization, sequential files structure of sequential files, Processing sequential files, small billing system.
- Introduction to data base system :** (Periods- 4hrs. Mks-15)  
General concept, Hierarchical network, Relational approaches

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Introduction to data structure and classification	08	13	10%	D
2.	Linear data structure & their sequential storage	08	24	17%	D
3.	Linear data structure and their linked storage representation	10	24	20%	M
4.	Nonlinear data structure	08	24	18 %	M
5.	Graphs and their representation	10	24	15%	M
6.	Sorting and Searching	10	20	10%	E
7.	Files Structure	06	20	10%	E
8.	Introduction to data base system	04	15	10%	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Introduction to data structure and classification
2. Linear data structure and sequential storage representation
3. Linear data structure and their linked storage representation
4. Nonlinear data structure

#### Section II

5. Graphs and their representation
6. Sorting and Searching
7. Files Structure
8. Introduction to data base system

**Total Theory Hours : 64 Hrs.**

**Total Practical Hours : 32 Hrs.**

List of Practical :

1. A program for inserting an element into an array.
2. A program for deleting an element from an array.
3. A program for pushing an element into an array.
4. A program for popping an element in an array.
5. A program for inserting an element into queue.
6. A program for deleting an element from queue.
7. A program for converting an infix expression to postfix.
8. A program for traversing a linked list.
9. A program for inserting an element into the beginning of list.
10. A program for binary search.
11. A program for selection sort.
12. A program for quick sort.

Reference Books :

An Introduction to data structure with application By – Trembly & Sorenson  
 Fundamentals of data structure By – Horowitz & Sahani  
 Data Structure by Lip Schutz

#### **Additional References:**

Pascal + Data Structure by Dele N. Lilly



**COMPUTER PERIPHERAL & DEVICES (IT-18)**

(One Paper – 3 Hrs., Theory-100 Marks, Lect.4/Week, Pract.: 2/Week,

Oral – 50Marks, TW-25Marks, Credit: 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work Paper	Term work	Pract. Exam	Total		
Computer peripheral Devices	4	2	-		1,3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	IT- 18	426

**Rationale:**

This subject is also intended to introduce commonly used input/output devices and its working with computer system. The subject also introduces different peripheral chips responsible for interfacing with 8085.

**Objectives:**

- To make the students familiar with various peripheral devices and measuring instruments.
- To introduce the students about various hardware used inside the PC and also with peripheral devices.
- To introduce the students about measuring instruments.
- Studying various measuring instruments they can be able to measure various parameters inside the PC hardware.
- So that they can understand the actual fault and location of the fault as they are studying hardware and peripheral device in this subject.

**Theory contents :**

- Computer peripheral input device** (Periods-10 hrs. Mks-30)  
Study & usage of following devices –  
IBM PC keyboard  
MS. MOUSE  
DIGITIZER  
JOYSTICK  
LIGHT PEN  
SCANNER  
Understanding How to use these devices.
- Computer peripheral and input device** (Periods- 12 hrs. Mks-24)  
Study of usage of output devices  
Display output devices:  
CRT monitor : Hardware details, RC/TTc connector, CGA, HGA, VGA, EGA, monitors study, LCD monitor, Types of LCD's, seven segment display, Printer (serial & parallel) Dot matrix printers, Daisy wheel printers/Line printers, laser printers, Plotter, x-y plotter, Ink jet plotters
- Computer peripheral storage devices** (Periods- 8 hrs. Mks-18)  
Floppy disk drive, Tape drive, hard disk, Card reader
- Measuring concept** (Periods-6 hrs. Mks-20)  
Significance of measurement. Methods of measurement.
- Basic of do indicating instruments** (Periods-10 hrs. Mks-18) Galvanometer, PMMC,  
Dc ammeter, Dc Voltmeter, Alternating current indicating instruments.
- Oscilloscope** (Periods- 6 hrs. Mks-22)  
Functional study of oscilloscope, Study of various types of oscilloscope, Sampling oscilloscope, Storage oscilloscope
- Study of signal generator, Logic analyser, Spectrum analyser, Emulators** (Periods- 6 hrs. Mks-16)
- Study of standard buses** (Periods- 6 hrs. Mks-16)  
RS232C, IEEE488, Centronic Parallel interface.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Computer peripheral input device	10	30	14	E
2.	Computer peripheral and i/p devices	12	24	20	M
3.	Computer peripheral storage devices	08	18	12	E
4.	Measuring concept	06	20	10	D
5.	Basic of do indicating instruments	10	18	14	E
6.	Oscilloscope	06	22	10	E
7.	Study of signal generator, Logic analyser, Spectrum analyser, Emulators	06	16	10	E
8.	Study of standard buses	06	16	10	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Computer peripheral input device
2. Computer peripheral and i/p devices
3. Computer peripheral storage devices
4. Measuring concept

#### Section II

5. Basic of do indicating instruments
6. Oscilloscope
7. Study of signal generator, Logic analyser, Spectrum analyser, Emulators
8. Study of standard buses

**Total Theory Hours = 64 hrs**

**Total Practical Hours = 32 Hrs.**

#### List of Practicals :

1. Study of Monochrome Graphic Adaptors.
2. Study of Colour Graphic adaptors
3. Understanding working principles of Monitors  
i) Black & White ii) Colour
4. Understanding Mechanical Assembly of floppy disk drive
5. Understanding Mechanical Assembly of hard disk drive
6. Understanding Principle of operation of Dot Matrix printer
7. Understanding Principle of operation of Laser printer
8. Understanding Principle of Daisy wheel printer
9. Interfacing techniques used for printer study of IBM cables specifications
10. Study of general purpose Oscilloscope, Storage Oscilloscope
11. Study of logic analyser
12. Study of logic Spectrum analyser
13. Study of emulator
14. Study of signal generator
15. Study of digital multimeter.

#### Reference Books:

1. Electronic Instrumentation and Measurement Techniques by W.D. Cooper, A.D.. Helerick
2. Electrical and Electronic Measurement and Instrumentation by A. K. Sawhney  
Users Guide for various Devices.

#### Additional References :

1. IBM PC/XT Technical Reference.
2. IEEE Technical Issues
3. Byte Magines.

**COMMUNICATION SYSTEMS (IT-19)**

(One paper-3 Hrs, Theory : 100Marks, Lecture : 4/Week, Pract. : 2/Week,

Tutorial : 1/Week, T.W. : 50Marks, Oral : 50Marks, Credit :7)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract. Exam	Total		
Communication System	4	2		1	1,3 Hrs., 100 Mks.	20	80	50	50	200	(Oral)	IT- 19	427

**Rationale:**

The subject Communication system intends to teach the students transmission and reception of the signals using modulation techniques, Multiplexing schemes, broad band communication, and antennas.

**Objectives :**

To understand :

1. Transmission and reception of basic communication system
2. Procedures of wireless, satellite communication system.
3. The modern communication techniques.

**Theory Contents :****1. Introduction to Modulation****(Periods-18 hrs. Mks-30)**

- Need for Modulation

- Modulation methods – Amplitude modulation, Frequency modulation, Single side band technique, (Transmitters and Receivers), comparative performance of Amplitude Modulation and Frequency Modulation, Introduction to Pulse Modulation – Pulse Time Modulation, Pulse Width Modulation, Pulse Position Modulation, Pulse Code Modulation

**2. Elements of Television System****(Periods-15 hrs. Mks-25)**

Scanning process, Bandwidth requirements, vestigial side band Technique, Monochrome Transmission and Receiver, Colour T.V. system

**3. Multiplexing Schemes****(Periods-2 hrs. Mks-16)**

Types of Multiplexing – Time Division Multiplexing and frequency “Division Multiplexing

**4. Information Theory and Noise****(Periods-4 hrs. Mks-15)**

Shannon Hartley’s Theorem, Channel capacity, Rate of Information, Entropy, channel efficiency, Types of Noise and their effect on communication signal.

1. Phase locked loop its application : PLL 565

**5. Propagation****(Periods-4 hrs. Mks-20)**

Fundamentals of Electromagnetic Waves, Propagation of waves – Ground(surface) wave propagation, sky waves propagation, space wave propagation, space wave propagation.

**I. Antennas****(Periods-6 hrs. Mks-18)**

Radiation Mechanism, Antenna Gain, Antenna resistance, Bandwidth beam width, Directional High frequency Antenna, Dipole Antenna, Yagi-Uda Antenna, Folded Dipole Antenna

**II. Introduction to Data Communication (Periods- 8 hrs. Mks-15)**

Phase shift keying (PSK), Frequency shift keying(Fsk) MODEM and its application.

**III. Broadband Communication System (Periods-7 hrs. Mks-25)**

Satellite, Microwave, Cable T.V., Fibber-Optic Communication system.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Introduction to Modulation	18	30	20	M
2.	Elements of Television System	15	25	15	M
3.	Multiplexing Schemes	02	16	10	D
4.	Information Theory and Noise	04	15	07	D
5.	Propagation	04	20	15	E
I.	Antennas	06	18	10	E
II.	Introduction to Data Communication	08	15	08	E
III.	Broadband Communication System	07	25	15	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Introduction to Modulation
2. Elements of Television System
3. Multiplexing Schemes
4. Information Theory and Noise

#### Section II

5. Propagation
  - I. Antennas
  - II. Introduction to Data Communication
  - III. Broadband Communication System

**Total Theory Hours = 64 hrs**

**Total Practical hours : 32 Hrs.**

#### List of practicals :

1. Study of A.M., F.M. SSB Generation
2. A.M. Transmitter
3. Study of A.M./Fm Radio Receiver – Medium Wave, short Wave
4. Study of T.V. Receivers : Colour T.V., Monochrome T.V. Receiver
5. Study of PLL
6. Study of Fibre optic Communication
7. Study of PCM, PWM
8. Study of PSK, FSK
9. Antenna – Directivity, Gain of different types of Antennas.
10. Study of Transmission line

#### Reference Books:

Electronic Communication Systems by G.Kennedy.  
Principles of Communication System by Taub and Schilling

#### Additional References :

Monochrome Colour T.V. by R.R. Gulati.  
Electronic Communication by Roddy and Coollen.  
Communication Systems by B.P. Lathi

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract. Exam		
<b>Fundamentals of Operating System</b>	4	2	--		1, 3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	<b>IT-36</b>	426

**Rationale:**

The subject operation system intends to teach the students design and data structures used to develop an operating system. The students will also learn the various services of an operating system, organized in various layers to perform different functions. These basic concepts can be used for a proper understanding of single user and multi-user operating systems.

**Objectives:**

Student will be able to learn about

- 1) Memory management
- 2) File management
- 3) Distributed system
- 4) Multiprocessor system
- 5) Process management

*Theory contents:*

1. **Processes** (Periods-10hrs.,Mks-20)  
The process concept, systems programmer's view of processes, the operating system view of processes, Operating system services for process management, Scheduling algorithms, Performance evaluation.
2. **Interprocess Communication and Synchronization** (Periods-10 hrs.,Mks-24).  
The need for inter process synchronization, mutual exclusion, semaphores, Hardware support for mutual exclusion, Queuing implementation of semaphores, Classical problems in concurrent programming, Critical region and conditional critical region, monitors, messages, deadlocks.
3. **Memory Management** (Periods-12hrs.,Mks-25)  
3.1 Contiguous allocation  
Single process monitor, Partitioned memory allocation stack, Partitioned memory allocation – Dynamic, segmentation.  
3.2 Non-contiguous allocation  
Paging, virtual memory (allocation policies and page replacement policies).
4. **File Management** (Periods-8 Hrs.,Mks-25)  
Command language user's view of the file system disk organization, disk controller and driver, operating system's view of file management, disk caches and Unix Buffer cache, a generalization of file services.
5. **Security and Protection** (Periods-8 Hrs.,Mks-25)  
Security threats and goals penetration attempts, security policies and mechanisms authentication, protection and access control, format models of protection, cryptography worms and viruses.
6. **Multi processor Systems** (Periods-8 Hrs.,Mks-25)  
Motivation and classification, multi processor interconnection, types of multi processor operating system, multi processor OS functions and requirements introduction to parallel computing, multi processor synchronization
7. **Distributed Operating Systems: algorithms** (Periods-8 Hrs.,Mks-20)  
Rationale for distributed systems, computer networks algorithms for distributed processing going with failures

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Processes	10	20	16%	M
2.	Interprocess Communication and Synchronization	10	24	16%	M
3.	Memory Management	12	25	15%	M
4.	File Management	08	25	12%	E
5.	Security and Protection	08	25	16%	E
6.	Multi processor Systems	08	25	15%	E
7.	Distributed Operating Systems: algorithms	08	20	10%	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. Processes
2. Interprocess Communication and Synchronization
3. Memory Management
4. File Management(First Half Portion)

### Section II

4. File Management(Remaining Half Portion)
5. Security and Protection
6. Multi processor Systems
7. Distributed Operating Systems: algorithms

Total Theory Hours = 64 hrs

Total Practicals Hours = 32 hrs

### List of Practicals:

- 1) Program for implementing DOS command 'TYPE' in c
- 2) Program for implementing DOS command 'COPY' in c
- 3) Program for Static partitioning – Memory Management
- 4) Program for Dynamic partitioning – Memory Management
- 5) Program for page replacement strategy.
- 6) Program for first come first served scheduling
- 8) Program for shortest job first scheduling
- 9) Program for round robin scheduling
- 10) Program for implementation of dead lock avoidance mechanism.

### Reference Books :

“Operating systems – Concepts and Design” Milan Milenkovic, McGraw-Hill international Edition – computer Science series 1992

“An introduction to operating Systems” Harvey M. Deitel, Addison- Welley Publishing Company 1984

“Operating System Concepts” James L Peterson, Abram Silberschatz, Addison – Wesley Publishing Company 1989,

### Additional References:

“Operating system” by Achyut Godbole.

“Modern Operating Systems” Andrew S. Tanenbaum, Prentice-hall of India private ltd. 1995.

**VISUAL BASIC (IT-21)**

(One Paper- 3 hrs, Theory: 100 Marks, Lecture: 4/Week, Pract:2/Week,  
Pract.: 50Marks,T.W.:25Marks, Credit :6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total			
<b>Visual Basic</b>	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	50	175	<b>IT- 21</b>	426	

**Rationale:**

This subject helps to understand the principles and techniques involved in developing applications with Visual Basic. The course content is designed to understand & implement the event driven architecture of visual programming. The students would be able to identify different categories of controls, learn working with forms and different data access techniques, establish a data base connection and identify the categories of ActiveX controls and creating them.

**Objective:**

This subject helps to understand:

1. The principles and techniques involved in developing applications with Visual Basic.
2. Event Driven Architecture of Visual Programming.

3. To understand identify and use the different categories of controls, learn working with forms and different data access techniques, establish a data base connection and identify the categories of Active X controls and creating them.

**Theory Content :****1. THE DESIGN OF AN APPLICATION****(Periods-7Hrs.,Mks-10)****1.1 Using the Microsoft solution framework**

- Overview
- Models
- Design Phase
- Role of developers
- Logical design task

**1.2 Designing a system architecture**

- Understanding application structure
- Single tire
- Two tire
- Multi tire

**2. INTRODUCTION TO VB 6.0****(Periods-9 Hrs.,Mks-20)****2.1 VB environment**

- Menu bar, Toolbars, Toolbox
- Project explorer
- Properties window
- Form designer
- Form layout

**2.2 VB language**

- Variable, constants
- Arrays
- Procedures, functions
- Control flow statements
- Looping nesting

**2.3 Managing forms**

- Form basics
  - Form events
  - Form properties
  - Form methods
- 2.4 Using active X controls
- Working with controls
  - Using control arrays
- 2.5 Managing menus
- Creating and modifying menu at design time
  - Programming menu commands
  - Shortcut keys
  - Menus at run time
- 2.6 Drag and drop operations
- Drag mode property
  - Drag drop and drag over method
  - Mouse conflicts
- 2.7 Creating HDT'S
- Type command
- 2.8 Validating and processing user inputs
- Overview, importance, Types of validation Implementing form level validations
    - a) Keyboard handler
    - b) Enabling & disabling i/p
  - Implementing field level validations
    - a) Text box properties
    - b) Using event
    - c) Validate event
    - d) Masked edit box

### 3 CONTROLS AND EVENTS

(Periods- 7 Hrs.,Mks-15)

- Text box, List box, Combo box, Scroll bar and slider control.
- Container-picture box, frame.
- Option button, check box, command button, images.
- OLE controls.
- File controls.
- Designing a form using controls, concepts of events & properties, changing properties (routine and design time) Important events of each control and creating applications using controls.
- Timer

#### ADVANCE CONTROLS AND EVENTS

Common dialog box controls, the tree view and list view controls. The rich text box.

- Windows common controls- status bar, tab control, image list control, MS chart control.

### 4. MODULE, CLASS MODULE MDI, MENU EDITOR AND GRAPHICS

Theory

(Periods- 9 Hrs.,Mks-15)

- 4.1 Concept of module, class module, MDI, DLL's and how to use them.
- 4.2 Creating own menu using menu editor, popup menu.
- 4.3 Graphics :-  
Basic controls – Line and shape control, line method, circle method, pset method, RGB ( ) functions, paint picture ( ) method, Load picture ( ) function.

### 5. USING DEBUGGING TOOLS

(Periods- 7Hrs.,Mks-15)

- 5.1 Types of errors and debug menu
- Types of errors
  - Debug menu
- 5.2 Testing the application
- Immediate window
  - Using debug and local window
  - Setting watch expression
- 5.3 Implementing error handler
- How VB handles the run time errors
  - VB error handler



- VB error handling options
- Disabling the error handler
- Inline error handling

Centralized error handling

## 6. DATABASE CONNECTIVITY

(Periods- 8Hrs.,Mks-34)

### 6.1 How VB access data

- Data access interface
- Relational database concepts

### 6.2 Introduction to OLE DB & ADO

- What is OLE DB
- How OLE DB relates to ADO

### 6.3 SQL statements

### 6.4 ADO Data control

- Using ADO
- Connecting to data source
- Binding controls
- Using form wizard

### 6.5 Coding ADO

- Creating record set
- Adding records in record set
- Modify, delete, search

### 6.6 DSN & DSN-less connection

### 6.7 ADO REVISITED

- Introduction to ADO object model
- Connecting to data source
- Retrieving data
- Navigating records
- Modifying data
- Using data environment

## 7. INTRODUCTION TO ACTIVE X CONTROLS

(Periods- 9Hrs.,Mks-30)

7.1 The user control object- initialize Event, Terminate event, Init properties Event, paint/Resize event, observing the event in the Data controls.

7.2 Exploring the properties of Active X controls debugging the properties, extend properties, Ambient properties, creating design time only properties, creating a clock control, event in active X control.

7.3 Using the active-X control interface wizard adding the wizard to visual basic.

7.4 Property pages-using the property page wizard, creating property pages without the wizard.

7.5 Creating a simple active X control

## 8. FILE HANDLING IN VB & CRYSTAL REPORTS

(Periods-8 Hrs.,Mks-25)

### 8.1 File commands

- File handling functions

### 8.2 Sequential files

- Reading information from a file
- Adding to an existing file
- General sequential files
- Sending special characters to sequential files
- Making changes inside a sequential file
- The rich text box control & file handling

### 8.3 Random access files

- Headers and indexes for random access files

### 8.4 Binary files

- Binary files HANDLING

### 8.5 FILE SYSTEM CONTROLS

- File list boxes
- Directory list boxes
- Drive list boxes

## IMPLEMENTATION STRATEGIES :

The students should be given maximum hands on practice to develop skills in Visual Basic programming by using various Basic Controls and Advance Controls statements. Also the students will set new active X controls and property of the pages through assignments.

The concept of database & active data objects will help the students to use Visual Basic as a front- end tool and database software as backend to develop software systems.

A mini project can be done by the end of term.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	THE DESIGN OF AN APPLICATION	07	10	03%	D
2.	INTRODUCTION TO VB 6.0	09	20	12%	E
3.	CONTROLS AND EVENTS	07	15	10%	E
4.	MODULE, CLASS MODULE MDI, MENU EDITOR AND GRAPHICS	09	15	10%	E
5.	USING DEBUGGING TOOLS	07	15	05%	D
6.	DATABASE CONNECTIVITY	08	34	25%	M
7.	INTRODUCTION TO ACTIVE X CONTROLS	09	30	20%	M
8.	FILE HANDLING IN VB & CRYSTAL REPORTS	08	25	15%	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. THE DESIGN OF AN APPLICATION
2. INTRODUCTION TO VB 6.0
3. CONTROLS AND EVENTS
4. MODULE, CLASS MODULE MDI, MENU EDITOR AND GRAPHICS
5. USING DEBUGGING TOOLS

### Section II

6. DATABASE CONNECTIVITY
7. INTRODUCTION TO ACTIVE X CONTROLS
8. FILE HANDLING IN VB & CRYSTAL REPORTS

**Total Lecture Hours. : 64 Hrs.**

**Total Practical Hours. : 32 hrs**

### List of practicals :

1. Design a form using textbox , label, command buttons.
2. Observe five components in Microsoft VB 6.0 window i.e. observer Title bar, Tool bar, Project Window Form window and properties.
3. Move and resize VB components to form a standard VB layout.  
Set up form properties and save them as a project at desired location
4. Study the different form properties such as Border style, caption, control box, fonts, name, window state. Study the different FORM CONTROLS i.e. LABEL, TEXT-BOX, COMMAND BUTTON.
5. Study the different form Events i.e. LOAD, ACTIVATE, DEACTIVATE, INITIALIZE, UNINITIALIZE, TERMINATE etc.
6. Study MSG-BOX and input box functions. Design a form to display a picture using image option. Design form to create a font dialog box using combo box, text, option buttons and check box control.
7. Design a simple application using OLE control.
8. Design a from using Tab control, image list, status bar, tool bar which facilitates different Arithmetic operations. Study the tradition Drag & Drop operations in VB
9. Design a form using menu editor, MDI, common dialog box which has standard format like Notepad (e.g. file, edit, format) open, copy , font, save and cut.
10. Create an MDI application (parent and child form)
11. Create a menu and context sensitive and popup menu.  
Difference between ADO, RDD & DAO  
Design a simple database application for student's data using data control, DAO, RDO
12. Design a simple data base application for student's data using ADO, DB-LIST, DB combo
13. Create property pages (without using the Property page wizard)

14. Create a student's database file having minimum five fields/record and print relevant reports using crystal report.

**Reference Books :**

"The Complete reference VB6.0" by Net Jerka

"Programming in VB6.0" by Bradley, Millstaugh

***Additional references:***

"Mastering VB6.0" by Evangelos petront Sos.

Visual Basic 6.0 by bible.

**OPEN SOURCE TECHNOLOGY(IT-43)**(T.W.= 25 Marks, Pr.= 25 Marks, Lecture 1/week ,  
Practical 2/week , Tutorial 1/week, Credit :4)**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work	Paper term work	Exam (Oral)	Total		
Open Source Tchnology	1	2	1			20	--	50	25	95	IT	134

**Rationale:**

This course is designed to provide overview of Open source Technology, Open Source system as software development management System, Linux Operating System. Open Source system is widely used in industry; it is reliable, secure and flexible. Most of the Web applications are developed and deployed on Open Source System. The student will get familiar themselves with case study on Apache, web container, Web browser e.g. Mozilla Firefox Linux o.s, Eclipse, its design architecture, command structures, utilities.

**Objective: The student will be able to**

1. Understand basic facts of freeware, shareware softwares, it's advantages and limitations in the field of open source technology.
2. Acquire knowledge of general purpose applications by using Eclipse Rich client platform, Tomcat web server, Apache, Mozilla firefox, Grid, Linux.
3. Understand the advancement of free and open source software and content as a collaborative community by studying Fedora Project.
4. Understand importance of above knowledge in the context of core technology and technology area.

**Theory Contents:**

1. **Introduction to Open Source community:** (Periods-01 hrs, Mks-22)  
Process, Organisation, Certification, Definition of Open Source, Advantages and .Limitations Overview
2. **Development Cycle of Open Source:** (Periods-02 hrs, Mks-24)  
Freeware, Shareware, Comparison of open and closed software and free software Common misunderstanding of free software and open source, Development tools- Revision Control System, Concurrent version system, Profit from open source.
3. **Introduction to Open Source programming languages:** (Periods-04 hrs, Mks-22)  
Basic concept of open source programming languages, Programming Languages like python, Ruby (object oriented programming), How to copy, modify and redistribute the applications.
4. **Open Source system as software development management System:** (Periods-04 hrs, Mks-36)  
Apache- HTTP web server. Tomcat Web Server- web Container, Linux- Operating System based on UNIX
5. **Case Study:** (Periods-04 hrs, Mks-30)  
Mozilla Firefox- Web Browser, Eclipse- software framework for "rich-client applications"  
Globus GRID
6. **Fedora Project:** (Periods-01 hrs, Mks-30)  
RPM based Operating System, Fedora Documentation, Translation, Architectures, Development, Versions Features- Distribution, Software repositories, security features

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Introduction to open source	01	22	13	M
2.	Development Cycle	02	24	14	M
3.	Introduction to open source programming Languages	04	22	13	E
4.	S/W development Mgmt. system	04	36	24	E
5.	Case Study	04	30	18	M

6.	Fedora project	01	30	18	E
	<b>Total</b>	<b>16</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. Introduction to Open Source community
2. Development Cycle of Open Source:
3. Introduction to open source programming languages

### Section II

4. Open Source system as software development management System:
5. Case Study
6. Fedora Project

**Total Theory Hours. = 16 hrs.**

**Total Practicals Hours = 32 hrs**

**Total Tutorial Hours = 16 hrs.**

### List of Practicals :

1. Mini project report on open source communities
2. Downloading and demonstration of graphic related software
3. Downloading and demonstration open source java
4. Downloading and demonstration of open database software
5. Downloading and demonstration of open office
6. Downloading and demonstration of web utilities
7. Downloading and demonstration of antivirus
8. Downloading and demonstration of network monitoring tools

Note:- Minimum of five experiments must be performed /completed in journal for approval of term work acceptance other than the 75% requirement of attendance.

### Reference Books:

*Understanding Open Source Software development: Joseph Feller, Brian Fitzgerald*

*Understanding open source & free software licensing: Andrew M. St. Laurent*

Christopher Negus - Red Hat Linux 9 Bible - John Wiley & Sons

### Reference URL:

<http://www.opensource.org>

<http://www.redhat.com>

<http://www.linux.org>

<http://www.globus.org>

# **Industrial Tour**

(Paper:-, Theory: --, Lecture :--, Pract. : --, T.W.:---, Pract.:--, Credit :00)

**Teaching And Examination Scheme:** Nil

Under Multipoint Entry Credit (MPEC) System Curriculum Design IV<sup>th</sup> Semester of Full Time Diploma In Computer Engineering/ Information Technology (50% coverage of syllabus)

## **Educational Visit/ Industrial Tour –curriculum objectives**

Members of curriculum committee advised for non sandwiched pattern courses students are to be given live industry environment exposure. [Optional Non-Credit Component].The tour period/ duration up to seven days. The various learning areas through industrial educational tour with wide prospectus covers technical institutions , professional industries , IT sector , service industries, research institutions manufacturing / production plants in fulfilling major thrust areas

**Objectives:** Students are able to learn

- A. Generic Skill [DGS Sub. code:- CSE34 / IT10]
  - 1. Leadership Qualities, Professional Communication Skills
  - 2. Teamwork
  - 3. File Management
  - 4. Self Centered responsibility
  - 5. Internal Organization Hierarchy
  - 6. Time/ Task Management
  - 7. Presentation Skill, Self Development
  
- B. Technical Skill
  - 1. Industry work Culture
  - 2. Performance, Process of performing the job
  - 3. Functioning of Employee responsibility
  - 4. Discipline
  - 5. Trends of Projects
  - 6. Growth of Industry Requirement
  - 7. Career Planning
  - 8. Testing of Acquired Skills
  - 9. Learning Practical Skills
  - 10. Gain confidence
  - 11. Watch latest IT industry practices
  - 12. Dissemination of Information to the students
  - 13. Develop Broad vision
  - 14. Groomed to industries expectation
  - 15. Knowledge sharing
  - 16. Security and Safety Measures at Industry.

**Processes:** Visit as per planning

- 1) Identifying Areas
- 2) Academic calendar
- 3) Student/ Parent Undertaking
- 4) Approaching and contacting companies
- 5) Permission from companies
- 6) 50% Syllabus coverage
- 7) Monitoring students in Batches
- 8) Accommodation of Students/ Staff
- 9) Briefing of students
- 10) Schedules to parents
- 11) Rules and Regulations, safety instructions
- 12) Visiting Factories/ Industries- Noting of Key factors
- 13) Appraisal and interaction by factory/Industry executives

**Student Report:**

- 1) Report submission by individual student
- 2) Compiled report by CR/ SC
- 3) Presentation by CR on learning outcomes
- 4) Learning outcomes towards Staff/ Faculty
- 5) Student Feedback

**Review, Updation, Reimplementation of System**

Shri Vile Parle Kelavani Mandal's  
**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**

V<sup>th</sup> Semester (Diploma in Information Technology)

w. e. f. Batch admitted in July, 2008

Sr. No	Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
		Lecture	Pract. or Drg.	Tutorial		Sessional	Work Paper	Term work	Pract. Exam	Total			
1.	Multimedia & Animation	3	4	1	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT - 38	347	
2.	Fibre Optic Communication	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	25 (Oral)	150	IT – 23	426	
3.	Networking & Security	3	2	1	1,3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	IT – 24	326	
4.	Computer Graphics	3	2	1	1,3 Hrs., 100 Mks.	20	80	25	50	175	IT – 25	326	
5.	TCP/IP Internet	4	2	-	-----	20	-	50	50	120	IT – 26	426	
6.	Communication (Antenna Theory)	3	3	1	1,3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	IT - 27	336	
Total		20	15	4	6 Paper	--	--	--	--	995			
Total Periods: 39						Total Marks: 995							

**Lecture / Tutorial / Practical = 1 Hour**

Note:

- i) Sessional is to be accessed by Internal Examiner
- ii) Theory & practical is to be accessed by Internal Examiner & External Examiner combined.
- iii) Term work is to be accessed by Internal Examiner & External Examiner as per the ratio.
- iv) There will be three periodical test of 25 Marks for each subject. Best of two periodical test marks will be considered as a sessional of 20 % weightage.
- v) Final term end examination will be of 100 marks having weightage of 80%

**MULTIMEDIA AND ANIMATION (IT-38)**

(Theory=100Marks, T.W.= 50 Marks, Pr.= 50 Marks, Lecture 3/week ,  
Practical 4/week , Credit :7)

**Teaching And Examination Scheme:**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg. Tutorial		Sessional	Work	Paper	Term	work Pract.	Exam		
<b>Multimedia And Animation</b>	3	4	--	1,3 Hrs., 100 Mks	20	80	50	50	200	IT-38	347	

**Rationale :**

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

**Objective:**

Students will be able to:

1. Import, Export Images.
2. Edit Images.
3. Create Animation.
4. Build Flash Movie.
5. Integrate Audio & Video.
6. Build Text-Based Animation.
7. Play Movie.
8. Integrate Multimedia In Web Page.

**Theory Contents :****1. Multimedia Elements Multimedia Application**

(Periods-6 hrs, Mks-20)

I/P, O/P devices, Evaluation of Multimedia systems, Storage media

**2. Architecture & Issues For Distributed Multimedia System.**

(Periods-8 hrs, Mks-26)

Multimedia System Architecture, Distributed Multimedia, Synchronization, Orchestration & QOS Architecture, Framework for Multimedia System.

**3. Compression/Decompression & File Formats**

(Periods-10 hrs, Mks-36)

Need, Types, Evaluating & Visibility, Video Compression Technique, Introduction to Standardization of Algorithm, File Formats, History of RIF, TIFF, Introduction to RIFF, AVI, JPEG-objectives, Architecture, JPEG-DCT encoding Quantization, JPEG-stastical coding, predictive lossless coding, JPEG performance, MPEG-objectives, Architecture, BIT stream syntax performance, MPEG2 & MPEG4

**4. Multimedia Tool**

(Periods-8 hrs, Mks-26)

Introduction to Multimedia tool – Flash, Creating & Modifying elements, Line tool, fill/attributes, different shapes, text tools & pen tool, Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basic editing tools, selecting & deselecting elements, modifying created objects.

**5. Multimedia Authoring and User Interface**

(Periods-10 hrs, Mks-36)

Multi Media Authoring System and its type, Hypermedia Application Design considerations, User Interface Design, Information Access, Object Display / Playback Issues

**6. Distributed Multimedia Systems**

(Periods-6 hrs, Mks-20)

Components of Distributed Multimedia Systems, Distributed Client Server Operation, Multimedia Object Server, Multi Server Network topologies, Distributed Multimedia Databases



Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Multimedia Elements Multimedia Application	06	20	12	E
2.	Architecture & Issues For Distributed Multimedia System.	08	26	18	E
3.	Compression/Decompression & File Formats	10	36	20	M
4.	Multimedia Tool	08	26	18	E
5.	Multimedia Authoring and User Interface	10	36	20	M
6.	Distributed Multimedia Systems	06	20	12	D
Total		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>
(# M=Most Essential, E=Essential, D=Desirable)					

**Total Theory Hrs.= 48 hrs**  
**Total Practical Hrs. = 64 hrs.**

#### List of Experiments:

1. Create a cycle & name each part of cycle using different styles & format & animate text.
2. Draw seed & create small plant with use of at least 4 frames.
3. Create a forest of tree with flowers & fruits from a small plant using different layers & frame transition time.
4. Create a forest of trees using the object created earlier. Also add lighting and rain effect.
5. Insert audio to relevant frames that has lighting & rain effect.
6. Convert created work into file format which can be publish on web.
7. Interfacing digital-web-cam, capturing live image & editing using web-cam software.
8. Importing & exporting images, apply different image editing tools.
9. Mini Project: Students should create a movie of minimum 2 minutes playtime using either Flash or 3D-MAX or MAYA or Open Source Multimedia tool.

#### Reference Books :

1. Prabhat K. Andheigh, Kiran Thakrar, John F - Multimedia Systems Design- Prentice Hall of India
2. Koegel Buford - Multimedia Systems - Pearson Education
3. J.D. GIBSON – Multimedia Communication Directions and Innovations - Academic Press, Hardcourt India

#### Additional References:

1. R. Steimnetz, K. Nahrstedt- Multimedia Computing, Communication and Application - Pearson Education
2. Katherine Ulrich - Micromedia Flash for Windows and Macintosh - Pearson Education

**FIBRE OPTIC COMMUNICATION (IT-23)**

( One Paper- 3hrs, Theory – 100 Marks, Lect.- 4/ Week , Pr. – 2/Week ,  
Oral - 25 Marks, TW – 25Marks, Marks Credit – 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination							Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract. Exam	Total			
<b>Fibre Optic Communication</b>	4	2	-		1,3 Hrs., 100 Mks.	20	80	25	25 (Oral)	150	<b>IT – 23</b>	426		

**Rationale:**

This subject introduces advanced communication techniques using Fibre Optics includes fundamental, properties & uses.

**Objectives :**

To understand :

1. Transmission and reception through fibre optics
2. Fundamentals of optical fibre.

**Theory Content :****1. Fundamentals of Fibre Optics****(Periods- 6 hrs, Mks-25)**

Physics Principles Light Relection, Refraction, Refractive Index, Total Int Reflection, Optic Fibre Structure, Basic Optical Laws, Single Mode, Multi Mode Fibre Properties, Advantages

Fibre Material, Fibre and OFC Manufacture.

**2. Properties of Fibre****(Periods-4 hrs, Mks-16)**

Physical, Electrical

Losses in Fibres – Attenuation, Dispersion, Bandwidth  
Step Index, Graded Index Fibre.

**3. Optical Fibre Cable****(Periods-8 hrs, Mks-25)**

Different Types of Cables – Environment, Applications, Breakout, Outdoor, Aerial, Tightly Buffered, Loose Tube, Ribbon Cable, Properties Cable Laying – Specification Laid Out.

**4. Optical Communication Requirement****(Periods-12 hrs, Mks-30)**

Transmission – Light Source, LED, Lasers (Different Types), Frequency of

Operating

Power

Modulation

Receiver – Basic Principle – Optical Signal To Electrical Signal Demodulation

Types of Receiver

Photo Detectors, Performance, Consideration

Receiver Power , Bit Error Rates

Pre Amplification, Amplification.

**5. Other Components / Devices Uses****(Periods-10 hrs, Mks-15)**

Repeaters, Regenerators, Optical Amplifier, Basic

Connectors – Different Types, Attenuation

Splicing – Mechanical , Fusion , Losses, Housing.

**6. Optical Measurements****(Periods-8 hrs, Mks-18)**

Optical Power , Units

Fibre Continuity

Attenuation  
Dispersion  
BER

**7. Instruments**

**(Periods-6 hrs, Mks-15)**

Optical Power Metres, Light Sources, Talk sets, OTDR, Optical Fibre Analysis  
Fibre Continuity – Practical use of the equation.

**8. System Concepts**

**(Periods-10 hrs, Mks-20)**

Networks  
Digital / Analog Transmission  
Optical Multiplexing – WDM  
SGNET / SDIT , ATM

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage	# M / E / D
				%	
1.	Fundamentals of Fibre Optics	06	25	18	M
2.	Properties of Fibre	04	16	07	E
3.	Optical Fibre Cable	08	25	18	M
4.	Optical Communication Requirement	12	30	20	M
5.	Other Components / Devices Uses	10	15	07	D
6.	Optical Measurements	08	18	08	E
7.	Instruments	06	15	07	D
8.	System Concepts	10	20	15	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. Fundamentals of Fibre Optics
2. Properties of Fibre
3. Optical Fibre Cable
4. Optical Communication Requirement (Half Portion)

**Section II**

4. Optical Communication Requirement (Remaining Half Portion)
5. Other Components / Devices Uses
6. Optical Measurements
7. Instruments
8. System Concepts

**Total Theory Hours : 64 Hrs.**

**Total Practical Hours : 32 Hrs.**

**List of practicals :**

1. Study of fibre optics structure.
2. Study of various types of optical fibre.
  - a) Step index fibre
  - b) Graded index fibre.
3. Study of various losses in optical fibre
4. Study of different types of cables of optical fibre
5. Study of transmission through optical fibre
6. Study of reception through optical fibre & types of receiver
7. Study of repeaters & connectors.
8. Study of optical power meters.

**Reference Books :**

Optical Fibre Communication - By Senior

**Additional References :**

Optical Fibre Communication - By Kaiser

Electronic communication system by William Schweber

**NETWORKING & SECURITY (IT-24)**

(One paper- 3 hrs, Theory : 100Mks, Lecture : 3/Week, Pract.: 2/Week,  
Tutorial : 1/Week, Credit : 6, T/W : 25m, Oral : 50 Mks)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work	Paper	Term work	Pract. Exam		
Networking & Security	3	2	1		1,3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	IT – 24	326

**Rationale:**

The objectives of this subject are to inculcate practical skills in the students relating to network installation, administration and management. The focus is on the practical aspects of networking of Windows NT and internet information server operating systems.

**Objectives :****The student will be able to :**

1. Learn the concepts of computers networks (LAN , WAN)
2. Understand OSI reference model and TCP / IP reference model
2. Understand Security issues in computer networks.
4. Do installation of NT server, Novell Server , and Proxy Server.

**Theory Contents :**

- 1) **Overview of OSI Model:** (Periods-14 hrs , Marks:35 )  
Physical layers, Data link layer, Transport layer, presentation layer, session layer, network layer, Application layer.  
**TCP/IP Protocol Suit :** Architecture, Layers  
**CSMA/CD**
- 2) **Wireless & local Loop (WLL)** (Periods-05hrs, Marks: 22)  
**CDMA Protocol**
- 3) **Architecture of Novell Directory Service (NDS)** (Periods-06hrs, Marks: 25)  
Active Directory Services (ADS).
- 4) **Remote Network Access** (Periods-06hrs, Marks:20 )  
Need of Remote Access  
Remote Access Technology  
**Virtual Private Network (VPN)**  
VPN Protocol  
VPN Clients
- 5) **Printing & Administration of Network** (Periods- 08hrs Marks:28)  
Network printing  
Managing shared printer  
Documenting a running network  
Upgrading Network  
Installation
- 6) **Security & Disaster Recovery:** (Periods- 05hrs Marks:34)  
**Internal Security**

Account Security  
 File & Directory permission  
**External Security**  
 Front door threats, Back door threats.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Overview of OSI Model	14	35	21 %	E
2.	Wireless & local Loop (WLL)	05	22	15 %	E
3.	Architecture of Novell Directory Service	06	25	16 %	E
4.	Remote Network Access	06	20	10 %	D
5.	Printing & Administration of Network	08	28	18 %	M
6.	Security & Disaster Recovery	05	34	20 %	E
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. Overview of OSI Model
2. Wireless & local Loop (WLL)
3. Architecture of Novell Directory Service

**Section II**

4. Remote Network Access
5. Printing & Administration of Network
6. Security & Disaster Recovery

**Total Theory Hours : 48 hrs.**

**Total Practical Hours = 32 hrs**

**List of Practical :**

1. Study of cables , connectors & hubs
2. Server installation
3. Connecting workstation to server (adding and removing workstation)
4. Frequency division multiplexing & Time Division multiplexing
5. Setting rights and giving permissions. (NT)
6. Installation of Novell server
7. Setting rights and giving permission (Novell)
8. Installation of proxy server
9. Sharing of output devices (printer )
10. Trouble – shooting
11. Introduction & Internet
12. Study of LAN Card.

**Reference Books:**

1. Computer Networks, by A.S. Tanenbaum (Prentice – Hall, India (2<sup>nd</sup> Edition )
2. Data and Computer Communications by William Stallings.  
(Prentice – Hall, India (4<sup>th</sup> edition)

**Additional References:**

1. Telecommunication, switching systems & Networks By T. Viswanathan (Prentice Hall, India)
2. Data Communications by W.L. Schweber (McGrow – Hill)
3. Data Communication & Distributed Networks “ by U Black (Prentice – Hall, India).

**COMPUTER GRAPHICS (IT-25)**

( One paper – 3hrs, Theory :100Mks, Lecture : 3/Week, Pract. : 2/Week,  
Tutorial : 1/Week, T/W : 25Marks, Pract. : 50m, Credit : 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional	Work Paper	term work Pract.	Exam	Total		
<b>Computer Graphics</b>	3	2	1	1,3 Hrs., 100 Mks.	20	80	25	50	175	<b>IT – 25</b>	326

**Rationale:**

This subject intends to teach the students the basic graphics primitives, based on turbo C++ compiler, graphics utilities. The advent of animation industry has brought graphics into focus as never before.

**Objective:**

- This course is designed to make the students familiar with basic graphics primitives.
- Students can implement these primitives on the screen using turbo C++ compiler.
- Implementation of these primitives will help the students in using the graphic utilities and libraries in their project development work.
- By studying graphics students can solve design problems.

**Theory Contents :****1. Introduction****(Periods – 03, Marks – 15)**

The origins of computer graphics, how the interactive graphic display works, new display devices, General purpose graphics software, The user interface, the display of solid objects

**2. Derivation of basic graphic primitives****(Periods – 06, Marks – 20)**

Coordinate system sine, Circle, Ellipse, algorithm explanations & implementation of the following Pixel blotting, line drawing, Circle & Ellipse drawing.

**3. Two dimensional transformation****(Periods – 05, Marks – 14)**

Transformation principles, Concatenation, Matrix representation

**4. Clipping & Windowing****(Periods –09, Marks – 20)**

Alien clipping algorithm, Midpoint subdivision, clipping other graphic entities, Polygon clipping Viewing transformations, the windowing transformations.

**5. Introduction to advance graphics topics****(Periods – 07, Marks – 30)**

Segments, Allasing & anti aliasing, Hidden line, surfaces, Beefier & spine curves, shading.

**Video editing:** Capturing Video & Audio, 'Title'ing, Mixing & premier.

**6. Raster graphics fundamentals****(Periods – 06, Marks – 20)**

Introduction , Generating a raster image, The frame buffer, display, Representing a raster image, scan converting, Line drawing, Displaying characters Speed of scan conversion Natural images

**7. Raster display hardware****(Periods – 03, Marks – 20)**

Raster display devices, The frame buffers, The random access frame buffers

**8. Display processors****(Periods – 09, Marks –25)**

The simple refresh line drawing display, random scan storage tube display, High performance display, the unbuffered high performance display, the buffered high performance display.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Introduction	03	15	05%	D
2.	Derivation of basic graphic primitives	06	20	22%	M
3.	Two dimensional transformation	05	14	08%	E
4.	Clipping & Windowing	09	20	25%	M
5.	Introduction to advance graphics topics	07	30	08%	E
6.	Raster graphics fundamentals	06	20	22%	M
7.	Raster display hardware	03	20	06%	E
8.	Display processors	09	25	04%	D
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. Introduction
2. Derivation of basic graphic primitives
3. Two dimensional transformation
4. Clipping & Windowing

### Section II

5. Introduction to advance graphics topics
6. Raster graphics fundamentals
7. Raster display hardware
8. Display processors

**Total Theory Hours : 48 Hrs**

**Total Practical Hours : 32 Hrs.**

### LIST OF EXPERIMENTS

Requirements :-

Minimum requirement is an IBM PC XY or AT with C Compiler. Assignments for the Graphics Laboratory

1. Pixel Drawing
2. Line drawing
3. Circle or Ellipse Drawing
4. Transformation
5. Polygon filling
6. Polygon Clipping
7. Segments

### REFERENCE BOOKS

Computer Graphics a programming approach by Steven Harrington  
 Computer Graphics by David Rogers.

### Additional References :

Interactive Computer Graphics by Numan  
 Computer Graphics by A.P.Godse.

**TCP/IP INTERNET (IT-26)**

(Lecture 4 / week , Practical – 2 / week , Credit – 6,  
(T/W- 25 Marks, Practical- 50 Marks) Total lectures contact Hrs : 64 Hrs.,  
Total Practical contact Hrs : 32 Hrs)\

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work	Paper	Term work	Pract. Exam		
TCP/IP Internet	4	2	-	-----	20	-	50	50	120	IT – 26	426	

**Rationale:**

This subject is design to provide overview of web designing. The students will be able to design Web pages using any HTML editor and can publish the web site.

**Objectives :**

1. This course is designed to provide overview of web design.
2. Student will be able to design web pages using any HTML editor & can publish the web site.

**Theory Contents :****1. Introduction and Overview****(Periods – 4, Marks –10 )**

The Motivation For Internetworking, The TCP/IP Internet, Internet Services, History and Scope Of the Internet, The Internet Architecture Board, The IAB Reorganization , The Internet Society, Internet Request For Comments, Internet Protocols and Standardization, Future Growth and Technology, Organization Of the Text, Summary.

**2. Review Of Underlying Network Technologies****(Periods – 05, Marks –12)**

Introduction, Two Approaches to Network Communication, Wide Area and Local, Area Networks, Ethernet Technology, Fiber Distributed Data Interconnect (FDDI), Asynchronous Transfer Mode, APPANET Technology, National Science Foundation Networking, ANSNET, A Planned Wide Area Backbone, Other Technologies Over Which TCP/IP Has Been Used, Summary and Conclusion.

**3. Internetworking Concept And Architecture Model****(Periods – 05, Marks –12 )**

Introduction, Application Level Interconnection, Network Level Interconnection, Properties Of the Internet, Internet Architecture, Interconnection Through IP, Routers, The User's View, All Networks Ate Equal, The Unanswered Questions, Summary.

**4. Internet Addresses****(Periods – 06, Marks –18)**

Introduction, Universal Identifiers, Three Primary Classes Of IP Addresses, Addresses Specify Network Connections, Network and Broadcast Addresses, Limited Broadcast, Interpreting Zero To Mean "This", Weaknesses in Internet Addressing, Dotted Decimal Notation, Loopback Address, Summary of Special Address Conventions, Internet Addressing Authority, An Example, Network Byte Order, Summary.

**5. Mapping Internet Addresses To Physical Addresses (ARP)****(Periods – 05, Marks –12 )**

Introduction, The Address Resolution Problem, Two Types Of Physical, Addresses, Resolution Through Direct Mapping, Resolution Through Dynamic Binding, The Address Resolution Cache, ARP Refinements, Relationship Of ARP To Other Protocols, ARP Implementation, ARP Encapsulation And Identification, ARP Protocol Format, Summary.

**6. Determining An Internet Address At Startup (RARP)****(Periods – 03, Marks –08)**

Introduction, Reserve Address Resolution Protocol (RARP), Timing RARP Transaction, Primary and Backup RARP Servers, Summary.

**7. Internet Protocol : Connectionless Datagram Delivery****(Periods – 03, Marks –08 )**

Introduction, A Virtual Network, Internet Architecture And Philosophy, The Concept Of Unreliable Delivery, Connectionless Delivery System, Purpose Of The Internet Protocol, The Internet Datagram, Internet Datagram Options, Summary.



**8. Internet Protocol : Routing IP Datagrams****(Periods – 04, Marks –10 )**

Introduction, Routing In An Internet, Direct And Indirect Delivery, Table-Driven IP Routing, Next-Hop Routing, Default Routes, Host-Specific Routes, The IP Routing Algorithm, Routing With IP Addresses, Handling Incoming Datagrams, Establishing Routing Tables, Summary.

**9. Internet Protocol : Error And Control Messages (ICMP)****(Periods – 04, Marks – 10)**

Introduction, The Internet Control Message Protocol, Error Reporting vs. Error Correction, ICMP Message Delivery, ICMP Message Format, Testing Destination Reachability And Status (Ping), Echo Request And Reply Message Format, Reports of Unreachable Destinations, Congestion And Datagram Flow Control, Source Quench Format, Route Change Requests From Routers, Detecting Circular Or Excessively Long Routers, Reporting Other Problems, Clock Synchronization And Transit Time Estimation, Information Request And Reply Messages, Obtaining A Subnet Mask, Summary.

**10. Subnet And Supernet Address Extensions****(Periods – 03, Marks –08 )**

Introduction, Review Of Relevant Facts, Minimizing Network Numbers, Transparent Routers, Proxy ARP, Subnet Addressing, Flexibility In Subnet Address Assignment, Implementation Of Subnets With Masks, Subnet Mask Representation, Routing In The Presence Of Subnets, The Subnet Routing Algorithm, A Unified Routing Algorithm, Maintenance Of Subnet Masks

Broadcasting Of Subnets, Supernet Addressing, The Effect Of Supernetting On Routing, Summary.

**11. Protocol Layering****(Periods–04, Marks–10)**

Introduction, The Need For Multiple Protocols, The Conceptual Layers Of Protocol Software, Functionality Of The Layers, X.25 And Its Relation To The ISO Model, Differences Between X.25 And Internet Layering, The Protocol Layering Principle, Layering In The Presence Of Network Substructure, Two Important Boundaries In The TCP/IP Model, The Disadvantage Of Layering.

The Basic Idea Behind Multiplexing And Demultiplexing, Summary

**12. User Datagram Protocol (UDP)****(Periods – 03, Marks – 08)**

Introduction, Identifying The Ultimate Destination, The User Datagram Protocol

Format Of UDP Messages, UDP Pseudo-Header, UDP Encapsulation And Protocol Layering, Layering And The UDP Checksum Computation, UDP Multiplexing , Demultiplexing , And Ports, Reserved And Available UDP Port Numbers, Summary.

**13. Reliable Stream Transport Service (TCP)****(Periods –04, Marks –10 )**

Introduction, The Need For Stream Delivery, Properties Of The Reliable Delivery Service, Providing Reliability, The Idea Behind Sliding Windows, The Transmission Control Protocol, Ports, Connections, And Endpoints, Passive And Active Opens, Segments, Stream , And Sequence Numbers, Variable Window Size And Flow Control, TCP Segment Format, Out Of Band Data, Maximum Segment Size Option, TCP Checksum Computation, Acknowledgements And Retransmission, Timeout And Retransmission, Accurate Measurement Of Round Trip Samples, Karn’s Algorithm And Timer Backoff, Responding To High Variance In Delay, Response In Congestion, Establishing In TCP Connection

Initial Sequence Numbers, Closing a TCP Connection, TCP Connection Reset

TCP State Machine, Forcing Data Delivery, Reserved TCP Port Numbers

TCP Performance, Silly Window Syndrome And Small Packets, Avoiding Silly Window Syndrome, Summary.

**14. Routing : Cores, Peers, And Algorithms (GGP)****(Periods – 04, Marks –10)**

Introduction, The Origin Of Routing Tables, Routing With Partial Information

Original Internet Architecture And Cores, Core Routers, Beyond The Core Architecture To Peer Backbones, Automatic Route Propagation, Vector Distance (Bellman – Ford) Routing, Gateway- To-Gateway Protocol (GGP), GGP Message Format, SPF Protocols, Summary.

**15. Routing : Autonomous Systems (EGP)****(Periods – 04, Marks –10 )**

Introduction, Adding Complexity To The Architecture Model, A Fundamental Idea : Extra Hops, Autonomous System Concept,

Exterior Gateway Protocol (EGP), EGP Message Header, EGP Neighbor Acquisition Messages, EGP Neighbor Reachability

Messages, EGP Poll Request Messages, EGP Routing Update messages, Measuring From The Receiver’s Perspective, The Key

Restriction Of EGP, Technocal Problems, Decentralization Of Internet Architecture, Beyond Autonomous Systems, Summary.

**16. Routing : In An Autonomous System (RIP, OSPF, HELLO)****(Periods –03, Marks –08 )**

Introduction, Static Vs. Dynamic Interior Routers, Routing Information Protocol (RIP), The Hello Protocol, Combining RIP , Hello , And EGP, The Open SPF Protocol (OSPF), Routing With Partial Information, Summary

The distribution of marks / weight age of each topic specified in this subject is considered taking into account sessional / assessment exam.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
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1.	Introduction and Overview	04	10	05	E
2.	Review Of Underlying Network Technologies	05	12	08	E
3.	Internetworking Concept And Architecture Model	05	12	08	E
4.	Internet Addresses	06	18	21	M
5.	Mapping Internet Addresses To Physical Addresses	05	12	08	E
6.	Determining An Internet Address At Startup	03	08	04	D
7.	Internet Protocol : Connectionless Datagram Delivery	03	08	04	M
8.	Routing IP Datagrams	04	10	05	E
9.	Error And Control Messages	04	10	05	E
10.	Subnet And Supernet Address Extensions	03	08	04	D
11.	Protocol Layering	04	10	05	E
12.	User Datagram Protocol	03	08	04	E
13.	Reliable Stream Transport Service	04	10	05	D
14.	Cores, Peers, And Algorithms	04	10	05	E
15.	Autonomous Systems	04	10	05	D
16.	An Autonomous System (RIP, OSPF, HELLO)	03	08	04	D
	<b>Total</b>	<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Introduction and Overview
2. Review Of Underlying Network Technologies
3. Internetworking Concept And Architecture Model
4. Internet Addresses
5. Mapping Internet Addresses To Physical Addresses
6. Determining An Internet Address At Startup
7. Internet Protocol : Connectionless , Datagram Delivery

#### Section II

8. Routing IP Datagrams
9. Error And Control Messages
10. Subnet And Supernet Address Extensions
11. Protocol Layering
12. User Datagram Protocol
13. Reliable Stream Transport Service
14. Cores, Peers, And Algorithms
15. Autonomous Systems
16. An Autonomous System (RIP, OSPF, HELLO)

**Total Theory Hours= 64 hrs.**

**Total Practicals Hours =32 hrs.**

#### List of practicals :

1. Write sockets to connect two machines in the intranet and show the communication by transmission of data from one machine to the other.
2. Write a program to implement ARP i.e. for the mapping of Internet Address to physical address.
3. Study the network in the lab and explain it with network architecture diagram. Explain the topology used.
4. Write a program for Routing of IP datagrams using the routing tables.
5. Implement the shortest path algorithm to find the shortest route using Routing tables.

#### Reference books:

Internetworking with TCP/IP by Douglas E. Comer  
The Protocols (TCP/IP Illustrated Volume 1) by W. Richard Stevens.

***Additional References :***

Sams Teach yourself TCP/IP in 24 Hours by Joe Casad

TCP/IP Jumpstart : Internet protocol basics by Andrew G. Blank.

**COMMUNICATION (ANTENNA THEORY) (IT-27)**

(One paper- 3hrs, Theory : 100Mks, Lecture : 3/Week, Practical : 3/Week,  
Tutorial : 1/Week, Credit : 6, T/W : 25m, Oral : 50Marks)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work	Paper	Term work	Pract. Exam	Total		
Communication (Antenna Theory)	3	3	1		1,3 Hrs., 100 Mks.	20	80	25	50 (Oral)	175	IT - 27	336	

**Rationale:**

This subject gives knowledge about the communication using Antenna, types of Antenna used for this communication and different parameters of antenna. It gives the concept of antenna and their applications.

**Objectives :**

- To understand basic concepts of antenna.
- to study transmission & reception using antenna.

**Theory Contents :**

**1. Basic Antenna concepts :** The origins of electromagnetic theory, electromagnetic spectrum, concept & electromagnetic wave propagation radiation from a short current filament. **(Periods – 14, Marks –25)**

**Basic Antenna Parameters :** Radiation pattern, directivity and gain, radiation resistance, beam area antenna losses and efficiency, Band width, beam width and polarization, aperture concept, effective height antenna impedance.

**2. Effects of Ground on Antennas :** Ungrounded antenna, Grounded antenna, grounding system, effects of antenna height **(Periods – 04, Marks –20)**

**3. Antenna Coupling :** General considerations, selection of feed point, Antenna couplers and feeders. **(Periods – 04, Marks –16)**

**4. Dipole Arrays :** Biconical antennas, folded dipole antennas, short dipole antenna, monopole antennas, Introduction to Antenna Arrays. Broad side array, End fire array, continuous arrays, super directive arrays, Parasitic arrays long-wire antenna with traveling wave current, Rhombic antenna. **(Periods – 08, Marks –20)**

**5. Aperture type antennas :** Radiate on from a planar aperture, Radiation from rectangular aperture, phased arrays, aperture efficiency. **(Periods – 04, Marks –20)**

**6. Microwave antennas :** Antennas with parabolic, Horn antennas, lenses antenna, slot antennas **(Periods – 04, Marks –20)**

**7. Wideband and special purpose :** Antennas Helical antenna, Disc one antenna, Log-period antenna, Loop antenna, phased array, Micro strip antennas, Resonant arrays, Non-resonant arrays. **(Periods – 05, Marks –25)**

**8. Receiving antennas :** Reciprocity theorems & effective area & antenna polarization mismatch of antennas, Antenna Temperature and signal to Noise ratio **(Periods – 05, Marks –18)**

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage	
				%	# M / E / D
1.	Basic Antenna concepts	14	25	20	M
2.	Effects of Ground on Antennas	04	20	10	E
3.	Antenna Coupling	04	16	08	D
4.	Dipole Arrays	08	20	10	E
5.	Aperture type antennas	04	20	10	E
6.	Microwave antennas	04	20	10	E
7.	Wideband and special purpose	05	25	20	M
8.	Receiving antennas	05	18	12	0E
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. Basic Antenna concepts
2. Effects of Ground on Antennas
3. Antenna Coupling
4. Dipole Arrays

**Section II**

5. Aperture type antennas
6. Microwave antennas
7. Wideband and special purpose
8. Receiving antennas

**Total Theory Hours : 48 Hrs**

**Total Practical Hours : 48 Hrs.**

**List of practicals :**

1. Study of various types of antennas.
2. To draw the radiation pattern for antenna.
3. To measure antenna parameters such as gain, directivity.
4. To study various microwave antennas.
5. Study of resonant & non-resonant array.
6. Study of receiving antennas

**Reference Books :**

1. Antennas Joh. D. Kraus
2. Electronic communication system : George Kennedy

***Additional References :***

1. Antenna & wave propagation : Collin R.E.

**SHRI BHAGUBHAI MAFATLAL POLYTECHNIC**VI<sup>th</sup> Semester (Diploma in Information Technology)

w. e. f. Batch admitted in July, 2008

Sr. No	Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
		Lecture	Pract. or Drg.	Tutorial	Sessional		Work	Paper	Term work	Pract. Exam	Total		
1.	System Analysis & Design	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50 Oral	200	IT - 28	326	
2.	E-Commerce	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	25 Oral	150	IT - 32	426	
3.	Entrepreneurship Development	5	-	1	1,3 Hrs., 100 Mks.	20	80	25	-	125	IT - 29	606	
4.	Project	-	9	-	1,3 Hrs., 100 Mks.	-	-	100	100 Oral	200	IT - 30	099	
5.	Web Technology	4	2	-	1,3 Hrs., 100 Mks.	20	80	25	25	150	IT - 31	426	
6.	Robotics	3	3	1	1,3 Hrs., 100 Mks.	20	80	25	25 Oral	150	IT - 33	336	
7.	Object Oriented Modelling & Design	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50 Oral	200	IT - 39	326	
8.	LINUX Administration	3	2	1	1,3 Hrs., 100 Mks.	20	80	50	50 Oral	200	IT - 40	326	
9.	Information Technology	4	2	-	1,3 Hrs., 100 Mks.	20	80	50	50	200	IT - 34	426	
Total		29	24	5	7 Paper	--	--	--	--	1575			
Total Periods: 58						Total Marks: 1175							

**Lecture / Tutorial / Practical = 1 Hour**

Note:

- i) Sessional is to be accessed by Internal Examiner
- ii) Theory & practical is to be accessed by Internal Examiner & External Examiner combined.
- iii) Term work is to be accessed by Internal Examiner & External Examiner as per the ratio.
- iv) There will be three periodical test of 25 Marks for each subject. Best of two periodical test marks will be considered as a sessional of 20 % weightage.
- v) Final term end examination will be of 100 marks having weightage of 80%

**SYSTEM ANALYSIS AND DESIGN (IT-28)**

(One Paper –3 Hrs., Theory : 100 , Lecture :3/Week, Pract. :2/Week, Tutorial – 1/W,  
Prac exam: 50 Marks, T.W.: 50 Marks, Credit: 6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract.	Exam		
<b>System Analysis &amp; Design</b>	3		2	1	1, 3 Hrs., 100 Mks.	20	80	50	50	200	<b>IT-28</b>	326	

**Rationale:**

In this age of information technology computer system, is playing an important role for automation. Computers systems are used as an effective communication and decision making tool for process and product automation in a business, industrial and educational environment.

**Objectives:**

The student will be able to

- Implement stepwise and systematic methodology approach for developing a software system design considering all software engineering principles.
- Understand the drawbacks of ad-hoc system development.
- Achieve the managerial skills necessary to execute a project within various technical and environmental constraints.

**Theory Contents:****1. The Information System Environment****(Periods- 06 hrs Marks:16)**

System Concept : Definition  
 Characteristics of a system : organisation Interaction  
 Interdependence, integration, Control objective  
 Elements of a System : Outputs & Inputs  
 Processor (s) Control, Feedback, Environment, Boundaries & Interface  
 Types of Systems : Physical or Abstract systems  
 Open or Closed systems. Man made information systems.

**2. Systems Development Overview****(Periods- 04hrs Marks:16)**

Introduction : The Systems's Life Cycle  
 New approaches to design  
 Resources for new systems  
 The practice of systems analysis and Design  
 Processing alternatives

**3. Role of the systems Analyst****(Periods- 04hrs Marks:16)**

The Role of the analyst : Use Design, Steps to follow

**4. Traditional tools for analysis & Design****(Periods- 06hrs Marks:16)**

Data collection, Analysis and Design tools

**5. Software Project Management****(Period-10 hrs Marks:31 )**

Planning software project, work Breakdown Structure, Integrating Software design and project planning,  
 Software Project teams. Project monitoring and controls.

**6. Preliminary Survey & Feasibility study contents****(Periods- 05hrs Marks:18)**

The Decision-making Body

**7. Systems Design Specifications****(Periods- 05hrs Marks:16)**

Study output; output, Considerations, Input, files, Processing, Coding, Manual Procedures, Error, work Plan

### 8. Documentation

(Periods- 04hrs Marks:20)

Design documentation user Documentation for Training, operations Documentation, User Reference Documentation

### 9. Testing and Installation; Testing User Consideration

(Periods- 04 hrs Marks:15)

The Aftermath, review of the Analysis Role

(It is expected to explain the procedure of system Analysis and design of following commercial system)

Accounts Inventory Control

Pay Roll

Sales & Purchases order system

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	The Information System Environment	06	16	11%	M
2.	Systems Development Overview	04	16	09%	E
3.	Role of the systems Analyst	04	16	09%	E
4.	Traditional tools for analysis & Design	06	16	11%	M
5.	Software Project Management	10	31	20%	E
6.	Preliminary Survey & Feasibility study contents	05	18	09%	E
7.	Systems Design Specifications	05	16	10%	E
8.	Documentation	04	20	12%	E
9.	Testing and Installation; Testing User Consideration	04	15	09%	E
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. The Information System Environment
2. Systems Development Overview
3. Role of the systems Analyst
4. Traditional tools for analysis & Design
5. File Design

#### Section II

6. Data Base management
7. Preliminary Survey & Feasibility study contents
8. Systems Design Specifications
9. Documentation
10. Testing and Installation Testing User Consideration

**Total Theory Hours = 48 hrs.**

**Total Practicals Hours =32 hrs**

#### List of Practicals:

- 1) Draw DFD for Railway Reservation system
- 2) Draw E-R diagram for Railway Reservation system
- 3) Program for Payroll system
- 4) Generate Simple Calculator.
- 5) Program for Inventory system
- 6) Program for Banking system
- 7) Program for Student information system
- 8) Program for Railway Reservation system
- 9) Program for Library system

#### Reference Books:

The Analysis, Design and Implementation of Information systems by Henry C. Lucas. Jr. (Mogran – Hill Book Company)  
Systems analysis & Design by Elias m Avad (Galgotia Publications Pvt. Ltd.)

#### Additional References :

Introducing Systems Analysis & Design, Vol. 1 & 2 prepared by NCC (National Centre for Computing) U.K.G.L. Simons (Chief Editor ) Published BY Galgotia Publications Pvt. Ltd.

#### Reference Website:

<http://www.rsqa.com>



**E-COMMERCE (IT-32)**

(One paper-3 hrs, Theory : 100 Marks, Lecture : 4/Week, Pract. : 2/Week,  
Credit : 6, T/W : 25Marks, Oral : 25Marks)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract.	Exam		
E-Commerce	4	2	-		1,3 Hrs., 100 Mks.	20	80	25	25	150	IT – 32	426	

**Rationale :**

This course is designed to provide overview of Web Design and Introduction to E-commerce used in Business application. Students will be able to design Web pages using any HyperText Markup Language (HTML), can able to add client side and server side script.

**Objectives :**

The students will be able to :

1. Learn Web page Designing and relevant software aspects.
2. Develop the Web page and principle of operation of all relevant topics.

**Theory Contents :****1. E-Commerce in Business****(Periods-10hrs Marks:20)**

Surfing internet intelligently to develop information dossiers

**E-Commerce Application**

Critical analysis of features of e-commerce site

**Web publishing**

HTML

**Technology & Tools****2. Java Application Development****(Periods- 10hrs Marks:20)**

Java advanced Java. Visual age for Java. OOAD.

**3. Web Application Development****(Periods- 10hrs Marks:25)**

VRML, Java script Active X, ASPs, Java Beans, Distributed computing , CGI using PERL.

**4. Networking, security and administration****(Periods- 10hrs Marks:25)**

Win NT core Tech. TCP/IP on win NT. IIS, Internet security & firewall eNetwork Firewall.

**Business Application****5. E-commerce professional****(Periods- 08hrs Marks:25)**

Net commerce Implementation customization, web marketing & statistics.

**6. Leveraging E-commerce for business performance and competitive advantage** Impact of E-commerce on organization :

working & its environment

**(Periods- 08hrs Marks:25)**

7. Integrated project design a business model

**(Periods- 08hrs Marks:24)**

Modelling an implementation for given business situation.

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	E-Commerce in Business	10	20	13	M
2.	Java Application Development	10	20	16	E
3.	Web Application Development	10	25	16	E
4.	Networking, security and administration	10	25	14	E
5.	E-commerce professional	08	25	11	E
6.	Leveraging E-commerce for business	08	25	15	E

7.	performance and competitive advantage Integrated project design a business model 08	24	15	E
	<b>Total</b>	<b>64</b>	<b>164</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. E-Commerce in Business
2. Java Application Development
3. Web Application Development
4. Networking, security and administration (Half Portion)

### Section II

4. Networking, security and administration (Remaining Half Portion)
5. E-commerce professional
6. Leveraging E-commerce for business performance and competitive advantage
7. **Integrated project design a business model**

**Total Theory Hours : 64 Hrs.**

**Total Practical Hours : 32 Hrs.**

### List of practicals :

1. Research on selected topics
2. Locate site offering distinctive features
3. Develop a simple site with good features
4. Develop and interactive site for information dissemination
5. Develop E-commerce application
6. Understanding ISP environment and creating IS administration and security environment.
7. Develop an integrated complete e-business solution 6
8. Application in retailing, customer relationship management, banking etc.

### Reference Books :

1. [E-Commerce: Business, Technology, Society, Second Edition](#) -- by Kenneth

### Additional References :

1. [Net Words: Creating High-Impact Online Copy](#) -- by Nick Osborne
2. [Sams Teach Yourself E-Commerce Programming with ASP in 21 Days \(Teach Yourself -- 21 Days\)](#) -- by Stephen Walther

**ENTREPRENEURSHIP DEVELOPMENT (IT-29)**

(One Paper-03 Hrs, Theory Marks-100, T/W Marks= 25, Lecture 5/ Week , Credit-6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Dig.	Tutorial		Sessional	Work	Paper	Term work	Pract. Exam		
Entrepreneurship Development	5	-	1	1,3 Hrs., 100 Mks.	20	80	25	-	125	IT – 29	606	

**Rationale:**

The entrepreneurship development part of the subject consists of topics related to the development of entrepreneurship skills and other details such as selection of product lines, site selection, financial aspects, personnel management, quality control and creative thinking. The subject includes the case studies in the related field.

**Objectives:**

This is a human science subjects intended to make aware about Entrepreneurship development, to each student the basic concepts, principles and procedures related to the Entrepreneurship. To expose student to the real life problems by case study and visits to the successful entrepreneurs.

**Theory Contents :**

UNIT – I : INTRODUCTION

**Chapter – I Introduction** (Periods-20hrs Marks:40)

UNIT – II : Information gathering for identification of opportunity

**Chapter – 2: The Concept of** (Periods- 03hrs Marks:08)

- 2.1. Entrepreneurship
- 2.2. Entre
- 2.3. preneur
- 2.4. Opportunity
- 2.5. Innovations.
- 2.6. Characteristics of Entrepreneur

**Chapter – 3 : The Information Sources for Business Opportunity** (Periods- 04hrs Marks:10)

- 3.1 The unexpected success failure
- 3.2 The incongruity
- 3.3 Innovations based on Process need
- 3.4 Change in Industrial structure
- 3.5 Demographics
- 3.6 Changes in perception mood and means.
- 3.7 New Knowledge scientific and non scientific
- 3.8 Discussion for sources.

**Chapter – 4 ; Information Gathering Techniques** (Periods-02hrs Marks:04)**Chapter – 5 : Identification of Product or Services for Getting business** (Periods- 02hrs Marks:04)**PRACTICAL CONTENTS**

Term work: Short reports on the information sources gathered form the newsletters, magazines or other literature.

UNIT – III : Product and Services

Chapter – 6 : Specification (Periods- 01hrs Marks:02)

**PRACTICAL CONTENTS**

Report on any one product/service, inclusive of its use, manufacturing qualities, trade names, etc.

**Chapter – 7 : Industries to be surveyed** (Periods- 01hrs Marks:02)**Chapter – 8 : Principles of market Survey** (Periods- 01hrs Marks:02)

Chapter – 9 : Analysis of Survey data &amp; Product Service design (Periods- 02hrs Marks:04)

**PRACTICAL CONTENTS**

Collection of data from at least five industries, report on data analysis

UNIT – IV : Project formulation for establishing own business or starting service.

**Chapter – 10: System concept & Project format based on Job design for Manufacturing Product of Creating service capabilities** (Periods- 06hrs Marks:12)

- 10.1. System concept
- 10.2. Project formats
- 10.3. Job design

**Chapter – 11: The Procedure of Estimation of Resources Required for Establishing**

(Periods- 06hrs Marks:12)

The Enterprise of Starting Service Business

- 11.1. Space.
- 11.2. Equipment
- 11.3. Human Resources
- 11.4. Financial Resources

**Chapter – 12: The Procedures of Project Report Writing for Getting approval from Financial Agencies for Starting Enterprise or Service**

(Periods- 02hrs Marks:04)

- 12.1. Project report Writing
- 12.2. Procedure for submitting project report to the firm.

**PRACTICAL CONTENTS**

Preparation Of proforma project report and format of detail project report

UNIT – V : Acquisition of the resource required for starting enterprise or service business

**Chapter –13: The concept of Quality Resources, Preparation of Specification and**

**Identification of specific need of Resources**

(Periods- 05hrs Marks:10)

**PRACTICAL CONTENTS**

**Term work:**

Preparation of specifications for resources (sample specification) like land, building, machinery and manpower.

**Chapter – 14 : Approach for Resources**

(Periods- 02hrs Marks:04)

**PRACTICAL CONTENTS**

Collection of list of suppliers of building materials/construction machineries

**Chapter – 15: Making Payments of Resources Received**

(Periods- 02hrs Marks:04)

UNIT – VI : Establishing and running the enterprise

**Chapter – 16: The Concept of management of Enterprise**

(Periods- 03hrs Marks:06)

**Chapter – 17: Production and Sale of Product/Passing the service Business** (Periods- 02hrs Marks:04)

UNIT – VII : Budgeting and accounting the expenditure for running the enterprise

**Chapter – 18 : Concept of Budgeting/accounting of Expenditure**

(Periods- 02hrs Marks:04)

**PRACTICAL CONTENTS**

Preparation of budget and balance sheet for small industry.(Industry to be selected from local area)

**Chapter – 19 : Budget preparation**

(Periods- 03hrs Marks:06)

**Chapter – 20 : Procedure of Accounting Expenditure**

(Periods- 02hrs Marks:04)

**Chapter – 21 : Preparation of Balance Sheet**

(Periods- 03hrs Marks:06)

UNIT – VIII : Evaluation & Quality control

**Chapter – 22 : Concept of Evaluation & Quality control**

(Periods- 02hrs Marks:04)

**Chapter – 23 : Principles of Evaluation & Quality Control**

(Periods- 02hrs Marks:04)

Chapter – 24 : Procedure of Evaluation & Quality Control

(Periods- 02hrs Marks:04)

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Introduction	20	40	21	M
2.	The Concept of Entrepreneurship	03	08		D
3.	The Information Sources for Business Opportunity	04	10	06	E
4.	Information Gathering Techniques	02	04	03	E
5.	Identification of Product or Services for Getting business	02	04	03	E
6.	Specification	01	02	01	D
7.	Industries to be surveyed	01	02	01	D
8.	Principles of market Survey	01	02	01	D
9.	Analysis of Survey data & Product Service design	02	04	03	E
10.	System concept & Project format	06	12	06	M
11.	Procedure of Estimation of Resources	06	12	06	M
12.	Procedures of Project Report Writing	02	04	03	E
13.	Concept of Quality Resources	05	10	06	M
14.	Approach for Resources	02	04	03	D
15.	Making Payments of Resources Received	02	04	03	D
16.	The Concept of management of Enterprise	03	06	05	M
17.	Production and Sale of Product	02	04	03	D
18.	Concept of Budgeting/accounting of Expenditure	02	04	03	E
19.	Budget preparation	03	06	05	E
20.	Procedure of Accounting Expenditure	02	04	03	E
21.	Preparation of Balance Sheet	03	06	05	E
22.	Concept of Evaluation & Quality control	02	04	03	D
23.	Principles of Evaluation & Quality Control	02	04	03	D

24. Procedure of Evaluation & Quality Control	02	04	03	D
	-----	-----	-----	-----
<b>Total</b>	<b>80</b>	<b>164</b>	<b>100%</b>	<b>#</b>
(# M=Most Essential, E=Essential, D=Desirable)				

### Section I

1. Introduction
2. The Concept of Entrepreneurship
3. The Information Sources for Business Opportunity
4. Information Gathering Techniques
5. Identification of Product or Services for Getting business
6. Specification
7. Industries to be surveyed
8. Principles of market Survey
9. Analysis of Survey data & Product Service design
10. System concept & Project format

### Section II

11. Procedure of Estimation of Resources
12. Procedures of Project Report Writing
13. Concept of Quality Resources
14. Approach for Resources
15. Making Payments of Resources Received
16. The Concept of management of Enterprise
17. Production and Sale of Product
18. Concept of Budgeting/accounting of Expenditure
19. Budget preparation
20. Procedure of Accounting Expenditure
21. Preparation of Balance Sheet
22. Concept of Evaluation & Quality control
23. Principles of Evaluation & Quality Control
24. Procedure of Evaluation & Quality Control

**Total Theory Hours = 80 hrs.**

**Reference Books :** Lecture Notes – To be prepared by subject teacher.

- 1) Dynamics of Entrepreneurial Development & Management (IV edition) by Shri Vasant Desai
- 2) Entrepreneurship Development by Shri S. S. Khanka
- 3) Small Scale industries & Entrepreneurship (7th edition) by Shri V. Desai

## PROJECT (IT-30)

(Practical : 9/Week, Credit : 9, T/W : 100 Marks, Oral : 100Marks)

### Teaching And Examination Scheme :

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination							Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract.	Exam	Total		
Project	-	9	-	-	1,3 Hrs., 100 Mks.	-	-	100	100	200	Oral	IT – 30	099	

### Rationale:

The project will enable the students to integrate the knowledge and skills acquired in the past two years of the diploma and third year of Diploma. This project title should be taken from the polytechnic or industrial situation.

### Project Development: The Right Approach

#### a. Project Selection

- i) Project must be based on knowledge acquired within three years of Diploma. Students must be aware with languages, packages, hardware. He is using from his project. If a particular language/package is not in syllabus he must possess a certificate of at least 6 months course completed in that language/package.
- ii) Repetition of project should be avoided as far as possible
- iii) After start of Academic Year, one-month period is to be provided for project selection. At the end of Sept. student must submit a 3-4 page document giving outline of project & feasibility study report.
- iv) Feasibility study includes
  1. Time feasibility
  2. Software, Hardware availability
  3. Sufficient information source
  4. Cost effectiveness, etc.
- v) A group of 3-4 students (at max) can develop a project.
- vi) Project may be
  1. Application Orientated
  2. System software
- vii) End of Sept. will be deadline for Project Selection.

#### b. Project Design

This is II phase in which students will actually start collecting detail information about their project

- i) Group must visit concern persons in the field to collect the system requirement. A practical design & development is to be achieved
- ii) They must adopt standard procedures, rules, regulation used in the real system & no imaginary model should be developed
- iii) Group can collect information about any other package, software currently under development on same subject or already developed, what facilities it provides, what are its drawbacks.
- iv) If any such software is implemented / installed at some industry students must visit & collect on site information
- v) Taking into consideration all requirements, design total system in top down fashion. Design must be modular & there must be clear distribution of task among group members.
- vi) At the end of Dec. students must submit "synopsis" giving details about system design & deliver a seminar making clear their views about project.

**c. Project development**

Remaining two-three months are to be utilised for actual coding, testing, of project.

- i) Independent module development is necessary
- ii) Enough time must be provided in time-table for project development.
- iii) There must be continuous assessment of project development
- iv) Prototype model may be developed & tested.
- v) Taking into consideration shortcoming & suggestions final software / Hardware should be developed before Mar. 31.

**d. Project Report**

MUST INCLUDE

- i) Project Design
- ii) Flow charts
- iii) Code
- iv) Future Development
- v) Bibliography
- vi) User manual
- vii) Costing

**e. Data sheets of only uncommon, (main integrator circuits.) Main I/S e.g. Speech synthesis & not of common I/C like 8085.**

There is no need of any explanation of common I/C and their interfacing

**Total Practical Hours = 128 Hrs.**

**WEB TECHNOLOGY (IT-31)**

( One Paper – 3 hrs, Theory :- 100 Marks, Lecture : 4/Week, Pract. : 2/Week,  
Credit : 6, T/W : 25Marks, Practical: 25 Marks)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial			Sessional	Work	Paper	Term work	Pract.	Exam		
Web Technology	4	2	-		1,3 Hrs., 100 Mks.	20	80	25	25	150		IT – 31	426

**Rationale :**

This course is designed to provide overview of Web Design. Students will be able to design Web pages using any HyperText Markup Language (HTML), can able to add client side and server side script. This course also provides overview of Active Server Pages.

**Objectives:**

The students will be able to:

1. Learn Web page Designing and relevant software aspects.
2. Develop the Web page and principle of operation of all relevant topics.

**Theory Contents :****1. Introduction to world wide web:****(Periods- 06hrs Marks:15)**

Evaluation of www, Basic features, www browsers, www Servers, HTTP & URL's

**2. www Browsers :****(Periods- 07hrs Marks:20)**

Basic features, Book marks, History, Progress Indicators, personalisation of Browsers, printing displayed page and Forms, Saving web pages, Netscape, Communicator, Internet Explorer, Search and Downloads.

**3. Web publishing :****(Periods- 04hrs Marks:21)**

Technology overview, web site planning, where to Host your web site, Multiple Sites on one server, maintaining a Web site, Publishing Tools.

**4. HTML, XML, DHTML :****(Periods- 08hrs Marks:20)**

Document overview, Header elements, Section heading, Block-oriented elements, Lists inline elements, Visual markup, Hypertext links, Uniform resource locators (URLS), Images forms, tables, Special Characters, XML, DHTML.

**5. Interactivity Tools :****(Periods- 05hrs Marks:10)**

CGI, Active X, VB Script, Java Script and Java.

**6. Multimedia and Graphics :****(Periods- 05hrs Marks:7)**

VRML

**7. Search Engines :****(Periods- 05hrs Marks:5)**

Technology overview, popular search engines, how to register a web site on search Engines.

**8. Internet security :****(Periods- 05hrs Marks:7)**

Overview of Internet security tureats, firewalls, Introduction to AAA.

**9. Introduction of Commerce on Net****(Periods- 04hrs Marks:15)****10. Usenet and Internet relay char****(Periods- 04hrs Marks:12)****11. E-mail and List Servers :****(Periods- 06hrs Marks:20)**

E-mail Networks, E-mail protocols (X400, SMTTP, UUCP), format of an email message, Description of email headers, email contents and enloading, email routing, list servers, email lients, POP-3, IMAP-4.

**12. Introduction of Flash 4, Photoshop, Corel draw, GIG Animator****(Periods- 05hrs Marks:12)**



Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Introduction to world wide web	06	15	10	M
2.	www Browsers	07	20	14	E
3.	Web publishing :	04	21	17	E
4.	HTML, XML, DHTML :	08	20	14	E
5.	Interactivity Tools	05	10	07	E
6.	Multimedia and Graphics	05	07	05	E
7.	Search Engines	05	05	04	E
8.	Internet security	05	07	05	E
9.	Introduction of Commerce on Net	04	15	04	E
10.	Usenet and Internet relay char	04	12	03	D
11.	E-mail and List Servers	06	20	13	E
12.	Introduction of Flash 4, Photoshop, Corel draw, GIG Animator	05	12	04	E
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

#### Section I

1. Introduction to world wide web
2. www Browsers
3. Web publishing
4. HTML, XML, DHTML

#### Section II

5. Interactivity Tools
6. Multimedia and Graphics
7. Search Engines
8. Internet security
9. Introduction of Commerce on Net
10. Usenet and Internet relay char
11. E-mail and List Servers
12. Introduction of Flash 4, Photoshop, Corel draw, GIG Animator

**Total Theory Hours =: 48 rs.**

**Total Practical Hours = 32 hrs**

#### List of Practicals :

1. Creating web pages :  
Creating a personal web, create web page using front page, connect web pages, create a list of items on a web page.
2. Enhancing web page :  
Insert Graphics in web pages, link web pages using images, represent data in tabular format, split the screen into separate windows.
3. Create the web page :  
Which will manipulate the data using visual script / java script
4. Validation of user
5. Design web page using Archive Server.
6. Design Layout of Web side page using different tools.

#### Reference Books :

1. Alexis Leon and mathews Leon – Internet for Everyone – Leon Tech world
2. Doughlas Comer – The Internet Book – Prentice Hall

#### Additional References :

1. Alexis Leon & Mathes Leon, Internet in a Nustshell, Vikas publications.
2. C Xavier – world wide web design with HTML

**ROBOTICS (IT-33)**

(One Paper – 3hrs, Theory: 100 Marks, Lectures – 3/ Week, Pract. – 3/Week,  
Tutorial – 1/Week, T/W: 25Marks, Oral: 25Marks, Credit –6)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or Drg.	Tutorial		Sessional	Work	Paper	Term work	Pract. Exam	Total		
Robotics	3	3	1	1,3 Hrs., 100 Mks.	20	80	25	25	150	IT – 33	336	

**Rationale:**

This course is designed to introduce fundamentals of Robotics and its functioning

**Objective:**

- 1) To introduce fundamentals concepts of Robotics
- 2) To familiarize with mechanical, electronics and computer aspects of Robots.
- 3) To understand overall functioning of Robot with its various aspects.

**Theory Contents:**

- 1) Types of robotics with sensors. Robotics equipped with camera. Robotic arm.  
(Periods- 02hrs, Marks: 10)
- 2) Robot sensors – Grippers, speed sensors, angle sensors, touch sensors, torque sensors, force sensors and other sensors.  
(Periods- 08hrs, Marks:25)
- 3) Fundamentals of robot vision – image representation, converting grey scale image to binary image, thresholding region labeling, shrink and swell operators, Euler number, recognition procedures, feature vectors, moments as descriptors, finding C.G., binding slant angle. Fourier descriptors.  
Robot training to recognize objects. Recognizing objects. Picking up a recognized object and placing it.  
(Periods- 08hrs, Marks:35)
- 4) Robot actuators, motors, hydraulic actuators. Different types of stepper motors, drive sequence for direction and speed control of stepper motor. Speed control and torque control feedback systems for D. C. Motor Drives.  
(Periods- 08hrs, Marks:30)
- 5) Direct Kinematics problem for two axis and three axis planer robots. Inverse kinematics of scara robot.  
(Periods- 04hrs, Marks:15)
- 6) Inverse Kinematics problem for two axis and three axis planer robots. Inverse kinematics of scara robot.  
(Periods- 07hrs, Marks:20)
- 7) Trajectory Planning Fundamentals  
(Periods- 04hrs, Marks:10)
- 8) Work envelops, workspace fixtures.  
(Periods- 04hrs, Marks:9)
- 9) Pick and place operation, continuous path motion, straight line motion, interpolated motion.  
(Periods- 03hrs, Marks:10)

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Types of robotics	02	10	04%	E
2.	Robot sensors	08	25	20%	M
3.	Fundamentals of robot vision	08	35	25%	M
4.	Robot actuators, motors, hydraulic actuators	08	30	22%	M
5.	Direct Kinematics	04	15	07%	D
6.	Inverse Kinematics	07	20	10%	E
7.	Trajectory Planning Fundamentals	04	10	04%	E
8.	Work envelops, workspace fixtures	04	09	04%	D
9.	Pick and place operation, continuous path motion, straight line motion, interpolated motion.	03	10	04%	E

**Total**                      **48**                      **164**                      **100%**                      **#**  
(# M=Most Essential,                      E=Essential,                      D=Desirable)

**Section I**

1. Types of robotics
2. Robot sensors
3. Fundamentals of robot vision
4. Robot actuators, motors, hydraulic actuators (Half Portion )

**Section II**

4. Robot actuators, motors, hydraulic actuators (Remaining Half Portion )
5. Direct Kinematics
6. Inverse Kinematics
7. Trajectory Planning Fundamentals
8. Work envelops, workspace fixtures
9. Pick and place operation, continuous path motion, straight line motion, interpolated motion

**Total Theory Hours = 48 Hrs**

**Total Practical Hours =48Hrs**

**List of Practicals :**

Use of teach pendent  
Robot study  
Pick & place Motion  
Robot Repeat ability  
Training Robot to recognize objects  
Training Robot to recognize number of objects  
Study of feature vector  
Reversing direction of a stepper motor by changing sequence  
Robot Sensors- Assignment/Practical

Reference Books :

Fundamentals of Robotics - Analysis and Control by Robert Schilling – PHI  
Robotics: Fu, Gonzales and Lee

**Additional References :**

Introduction to Robotics- By Gaig J. J.—Addison – Wesley.  
Industrial Robotics- By Groover- Mc Graw Hill

**OBJECT ORIENTED MODELLING AND DESIGN (IT-39)**

(One Paper – 3 hrs, Theory: - 100 Marks, T.W. = 50 Marks, Practical/Oral =50Mks

Lecture: 3/Week, Pract. : 2/Week, Credit: 6)

**Teaching And Examination Scheme:**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg. Tutorial		Sessional	Work Paper	Term work Pract.	Exam	Total			
<b>Object Oriented Modelling and Design</b>	3	2	1	1, 3 Hrs., 100 Mks.	20	80	50	50	200	Oral	<b>IT-39</b>	326

**Rationale :**

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

**Objective:**

The student will be able to:

- 1) Interpret / give the meaning of object-oriented concepts.
- 2) Understand different Modelling Methodology.
- 3) Prepare an object model for a given problem statement.
- 4) Prepare dynamic for a given problem statement.
- 5) Describe and Design the concepts of class diagram, object diagram, interaction diagram, sequence diagram collaboration, use case diagram, state diagram and activity.
- 6) Usage of anyone design tool.

**Theory Contents:****1. Importance of Modelling****(Periods-6 hrs, Mks-20)**

Brief overview of Object Modelling Technology (OMT) by Ram Baugh, Booch Methodology, Use Case driven approach (OOSE) by Jacobson, Overview of CRC card method by Cunningham.

**2. Object Modelling****(Periods-8 hrs, Mks-28)**

Objects and Classes (Object Diagrams, Attributes, Operations and Methods), Links, Associations and Advanced Concepts (General Concepts, Multiplicity, Link Attributes, Association as a Class, Roll names, Ordering, Qualification, Aggregation), Generalizations and Inheritance, Grouping Constructs, Aggregation verses Association And Generalization, Recursive Aggregates, and Propagation of Operations, Abstract Classes, Multiple Inheritance, Metadata, Candidate Keys, Constraints, Introduction to Dynamic and Functional Modelling.

**3. Overview of UML****(Periods-6 hrs, Mks-20)**

Efforts of standardization/Integration, OMG approval for UML, Scope of UML, Conceptual model of UML, Architectural – Metamodel, Unified Software Development Lifecycle, Introduction to UML Diagrams

**4. UML – Structural Modelling****(Periods-8 hrs, Mks-30)**

Advanced Class Diagrams: - Advanced Classes and Relationships, Interfaces, Types and Roles, Packages, Instances. Object Diagrams, Component Diagrams: Terms and Concepts, Common modelling techniques. Deployment Diagrams: Terms and Concepts, Common modelling techniques.

**5. UML Behavioral Modelling****(Periods-10 hrs, Mks-38)**

Use case diagram: Terms and Concepts, Modelling techniques, Interaction diagram (Sequence and collaboration diagram): Terms and Concepts, Modelling techniques, State chart diagram: Terms and Concepts, Modelling techniques, Activity diagram: Terms and Concepts, Modelling techniques.

**6. Architectural Modelling****(Periods-10 hrs, Mks-38)**

Components, Deployment, Collaborations, Patterns &amp; frameworks, Component Diagrams, Deployment Diagrams

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Importance of Modelling	06	20	10	E

2.	Object Modelling	08	28	10	E
3.	Overview of UML	06	20	20	M
4.	UML – Structural Modelling	08	30	20	M
5.	UML Behavioral Modelling	10	38	20	M
6.	Architectural Modelling	10	38	20	M
	<b>Total</b>	<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>
	(# M=Most Essential, E=Essential, D=Desirable)				

### Section I

1. Importance of Modelling
2. Object Modelling
3. Overview of UML

### Section II

4. UML – Structural Modelling
5. UML Behavioral Modelling
6. Architectural Modelling

**Total Theory Hrs.= 48 hrs**

**Total Practical Hrs. = 32 hrs.**

### List of practical:

**For Practical consider Two case studies.**

1. To demonstrate USECASE, class diagram.
2. To demonstrate activity, SWIMLane
3. To demonstrate object diagram, collaboration diagram
4. To demonstrate state change diagram
5. To demonstrate component & deployment diagram

### Reference Books:

1. Booch, Jacobson, Rumbaugh - The UML User Guide(Addison Wesley) (Refer for Third, Fourth and fifth Chapter)
2. Sinan Si Allie- Guide to applying the UML
3. Jon Holt- UML for System Engg.

### Additional References:

1. Object Oriented Modelling and Designing (Refer for First and Second Chapter) by Rumbaugh, Blaha
2. Practical OOD with UML–.( Refer for Fourth and Fifth Chapter) by Mark Paiestly

**LINUX ADMINISTRATION (IT-40)**

(One Paper: 3 Hrs., Theory: 100 Mks., Lec:3/week, Prac:2/week, Oral: 50, Credit :6)

**Teaching And Examination Scheme:**

Subject	Scheme of Instructions and Periods per week				No. of Papers, duration & Marks	Scheme of Examination					Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg.	Tutorial		Sessional Work	Paper	Term work	Pract. Exam	Total		
<b><u>LINUX ADMINISTRATION</u></b>	3	2	1		1, 3 Hrs., 100 Mks.	20	80	50	50 Oral	200	<b>IT-40</b>	326

**Rationale:**

This course is designed to provide overview of Linux Administration. Linux Operating System is widely used in industry, it is reliable, secure and flexible. Most of the Web applications are developed and deployed on Linux Operated PCs.

**Objectives:**

The students will be able to:

3. Install Linux Operating System.
4. Create users and super users, assigns access permissions.
5. Configure LAN and IP addresses.
6. Install CUPS and LPD for printing.

**Theory Contents:****1) Installation and Hardware Configuration****(Period 6 Hrs, Marks 18)**

Creating an Installation Diskette, Booting Linux Installation Program

Partitioning Hard Drive(s), Setting up Swap Space, Choosing Partitions to Format, Choosing Desired Packages to Install, Hardware Configuration, Multi-boot with Other Operating Systems, Downloading and Installing Red Hat Updates

**2) General System Administration Issues****(Period 8 Hrs, Marks 26)**

Root Account, Creating User Accounts, Changing User Passwords , Disabling User Accounts, Removing User Accounts, Linux Password & Shadow File Formats, System Shutdown and Restart

**3) Managing package with RPM****(Period 11 Hrs, Marks 40)**

Upgrading Linux and Other Applications, Using the Red Hat Package Manager (RPM), Installing or Upgrading Without RPM, Strategies for Keeping an Up-to-date System, Linux Kernel Upgrades , Upgrading a Red Hat Stock Kernel, Building a Custom Kernel, Moving to the Linux 2.2.x Kernels, Configuring the Apache Web Server

**4) Setting Up a Linux network****(Period 9 Hrs Marks 32)**

TCP/IP, configuring with ipconfig, arp, The hostname commands, network configuration files,

**5) Working with DNS and DHCP****(Period 7 Hrs, Marks 24)**

Configuring a DNS server, using DNS client, Setting up a DHCP server, Basic configuration,

**6) Printing with CUPS and LPD****(Period 7 Hrs, Marks 24)**

Printing system overview, CUPS: Building and installation, managing printers, Line Printer Daemon protocol, Commands, Usage

Sr. No.	Main Topics	No. of Contact Hrs.	Marks	Weightage %	# M / E / D
1.	Installation and Hardware Configuration	06	18	10	E
2.	General System Administration Issues	08	26	15	D
3.	Managing package with RPM	11	40	25	M
4.	Setting Up a Linux network	09	32	20	M
5.	Working with DNS and DHCP	07	24	15	E
6.	Printing with CUPS and LPD	07	24	15	D
<b>Total</b>		<b>48</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

**Section I**

1. Installation and Hardware Configuration
2. General System Administration Issues
3. Managing package with RPM

**Section II**

4. Setting Up a Linux network
5. Working with DNS and DHCP
6. Working with DNS and DHCP

**Total Theory Hours = 48 hrs.**

**Total Practical Hours =32 hrs.**

**List of Practicals:**

1. Installation of Red Hat Linux
2. Create an user , super user and various operations on user account
3. Install a RPM package and upgrade the package
4. Configure a web server
5. Configure a LAN in Linux
6. Configure DNS server
7. Install and manage printer

**Reference Books:**

1. Christopher Negus - Red Hat Linux 9 Bible - John Wiley & Sons
2. Michael Jang - Mastering Red Hat Linux 9 - BPB Publications

**Additional References:**

1. Ellen Siever, Aaron Weber, Stephen Figgins - Linux in a Nutshell, Fourth Edition - O'Reilly & Associates

**Web Sites:**

1. <http://www.linux.org>
2. <http://www.cups.org>

**INFORMATION TECHNOLOGY (IT-34) (Version 3.0)**

(One paper :3 hrs, Lecture : 4/Week, Pract.: 2/Week, Theory : 100 Mks,  
T/W:25Mks, Pract. : 50Mks, Credit : 5)

**Teaching And Examination Scheme :**

Subject	Scheme of Instructions and Periods per week			No. of Papers, duration & Marks	Scheme of Examination						Detailed Syllabus Ref. No.	Scheme L.Pr./Cr.
	Lecture	Pract. or	Drg. Tutorial		Sessional	Work	Paper	Term work	Pract.	Exam		
Information Technology	4	2	-	1, 3 Hrs, 100 Mks.	20	80	50	50	200	IT - 34	426	

**Rationale:**

This course is designed to provide overview of Web applications and introduction to Java. Java is a technology that makes it easy to develop programs for distributed applications that can be executed on multiple computers across a network. This course also provides overview of Applications Service Provider.

**Objectives:**

The student will be able to

- 1) Impart knowledge to the students in the field of Information Technology.
- 2) Incorporate the knowledge of emerging technology as per requirements of Industry.
- 3) Understand the relation between the latest trends of the industry versus emerging technical areas in the field of Information Technology.
- 4) Able to materialize the concepts of gaming, animation, mobile computing, ethical hacking and cyber law and various related tools/software.

**Theory Contents :**

1. **JAVA** (Periods- 18hrs, Marks:42)  
Introduction to Java language, Java language and Object Oriented Concepts, Abstract Windowing Toolkit, Multithreading, Useful Java packages, I/O, Networking.
2. **Oracle 9i Database Architecture** (Periods- 10hrs, Marks:25)  
Oracle instance, Memory Structures (SGA, PGA), Process Architecture (Client, Oracle process), Database files (Control, Data redolog), Table space, segments, Extends, Data blocks.
3. **Gaming and Animation** (Periods 06 Marks 16)  
Introduction , gaming industry , Types of game design, Game Design Sequence, Choose a Goal and a Topic, Research and Preparation, Design Phase , Pre-Programming Phase, Programming Phase Play testing Phase. Psychological profiling, human-machine interface (HCI)  
What is animation, animation tools, frame, actor, layer, storyboard , animation palette .
4. **Basics Of Mobile Computing** ( Period 08 Marks 24)  
Analog Cellular System, 1 G, 2G, 2.5 G 3 G and 4 G Mobile phones ,mobile services , Mobile system , GSM architecture, Subscriber Identity Module (SIM) Card , Wireless LAN, Mobile IP.
5. **Ethical hacking and Cyber Law** ( Periods 06 Marks 16)  
Terminology, System Hacking ,Session Hijacking, Web Application Vulnerabilities, Hacking Web Servers, Web Based Password Cracking Techniques, Penetration Testing  
Cyber crime, Introduction to Indian cyber law, E-commerce legal issues.
6. **I-pod** ( Periods 04 Marks 11)  
ARM processor, hardware requirement, software, facilities.
7. **Software Quality Assurance** (Periods- 12hrs, Marks:30)  
Quality Control:- Six Sigma Fundamentals



Software Testing: - Black Box Testing, White Box Testing. Software Costing:- LOC, FP, MATRICS

Sr.	Main Topics	No. of	Marks	Weightage	# M / E / D
No.		Contact Hrs.		%	
1.	JAVA	18	42	25	M
2.	Oracle 9i Database Architecture	10	25	15	M
3.	Gaming and Animation	06	16	10	E
4.	Basics Of Mobile Computing	08	24	15	M
5.	Ethical hacking and Cyber Law	06	16	10	D
6.	I-pod	04	11	07	E
7.	Software quality assurance	12	30	18	M
<b>Total</b>		<b>64</b>	<b>164</b>	<b>100%</b>	<b>#</b>

(# M=Most Essential, E=Essential, D=Desirable)

### Section I

1. JAVA
2. Oracle 9i Database Architecture
3. Gaming and Animation

### Section II

4. Basics Of Mobile Computing
5. Ethical hacking and Cyber Law
6. I-Pod
7. Software quality assurance

**Total Theory Hours : 64 Hrs**

**Total Practical Hours :32 Hrs.**

**List of Practicals :**

- 1) Use of Windows, Graphics, Text in programs like creating oval or any geometric shape or colouring objects or setting font size, type colour etc. using Applet Class.
- 2) Use of Swing in programs such as choosing an option & performing appropriate action, option can be menu, radio button, check button etc.
- 3) Use of Core Java concepts , Exception, Packages, Listeners and Multi threading.
- 4) Use of Oracle Enterprise manager to new different initialization, parameter at Oracle9idb server.
- 5) Use of startup and shutdown command and spfile and pfile to start and shutdown Oracle9idbserver.
- 6) Design a game using Java. Study the steps involved in gaming design.
- 7) Study and demo use of Animation tool .
- 8) Demonstrate 2.5 GSM Mobile Phone.
- 9) A case study on Ethical Hacking .
- 10) To demonstrate and study an I-pod.
- 11) Assignment on s/w estimation CEP

### Reference Books :

- 1) The Complete References: - Java 2 (4<sup>th</sup> Edition)
- 2) Manuals
- 3) Websites
- 4) [JavaBeans: Developing Component Software in Java](#), by IDG's new Power Guide series
- 5) [Java Network Programming](#), by O'Reilly & Associates
- 6) Mobile Computing By Schiller Pearson Publication.
- 7) Ethics and Security Management on the web by PHI.

### Additional References :

- 1) [The Java Handbook](#) by Patrick Naughton, Michael Morrison
- 2) [Concurrent Programming in Java: Design Principles and Patterns](#) by Doug Lea
- 3) Software Testing Books by Rick Hower
- 4) Software Quality Assurance Books by Rick Hower.
- 5) ethicalhacking.com

Reference URL:

[www.oracle.com](http://www.oracle.com),

*For Award of Diploma under Multipoint Entry & Credit System, the student / candidate has to earn total 180 credits including compulsory subjects out of total available 213 credits from 36 subjects. The examination pattern / scheme will be same as per the other diploma examination of this institute. The Final Award of Grade will be given on the basis of marks obtained in the final year of Information Technology i.e. Vth & VIth Semester under grade point average scheme / criteria / norms as laid down in the MPE&C System.*

The Detail Schedule since 2002 and its revision there after subsequently is given for information year wise (I – 1 to 6)

July 2007 – May 2008	I-1
July 2006 – May 2007	I-2
July 2005 – May 2006	I-3
June 2004 – May 2005	I-4
June 2003 – May 2004	I-5
June 2002 – May 2003	I-6