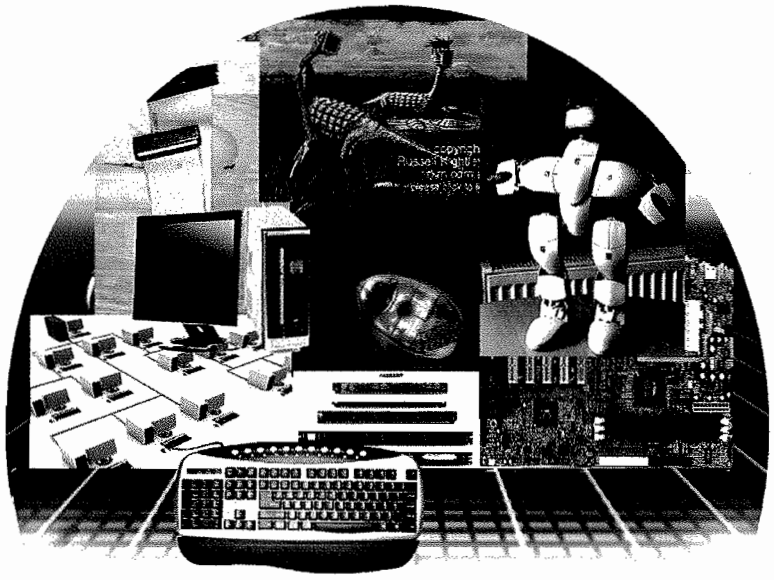
Government Polytechnic, Aurangabad

An Autonomous Institute of Governement of Maharashtra



Curriculum Document (2012)

Diploma in Information Technology

VISION

Government Polytechnic, Aurangabad will be world class technical institute pursuing for excellence, catering to the needs of global community, striving for its harmonious development by inculcating lifelong learning skills to serve for the socio economic development having concerned for ecology and social harmony

MISSION

To create multi disciplinary best citizens to suit local, state, National and International needs having scientific temperament , moral ethics , values and multi facetted proactive personality by providing excellent education system

CERTIFICATE

This is to certify that the Curriculum of Diploma in Information Technology Program has been implemented with effect from academic year 2011-12.

This Curriculum Document contains pages from 01 to

Head Information Technology, Government Polytechnic Aurangabad	**In Charge** Curriculum Development Cell Government Polytechnic Aurangabad	**Principal** Government Polytechnic Aurangabad

Date:-

CERTIFICATE

This is to certify that the Curriculum of Diploma in Information Technology Program of Govt. Polytechnic Aurangabad (An Autonomous Institute of Govt. of Maharashtra) which has been implemented with effect from 2011-12 academic year, is equivalent to Diploma in Information Technology Program Implemented by Maharashtra State Board of Technical Education , therefore Equivalence is hereby granted .

Member	Member	Member
( )	( )	( )
Member	Member	Member
( )	( )	( )
Member Secretary		Chairman
( )		( )

CONTENTS- A

INDEX

SCOPE OF DIPLOMA IN INFORMATION TECHNOLOGY.

Information Technology is emerging as a driving force in education, commerce and industry. 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. This programme apart from developing the above mentioned professional skills would also develop some of the soft skills like communication skills, social skills and life-long learning skills that are required by the industry.

AREAS OF EMPLOYMENT / WORK

Sr. No.	Type of industries/ organizations	Capacity (Designation) in which employed
i)	Entrepreneur	Proprietor, Software Developer
ii)	Software Development Sector	Trainee Programmer, Customer support Engineer
iii)	Information Technology Enabled Service sector	Asst. Programmer, Asst. Database Administrator, Asst. Network Administrator, Network Technician, Customer support Engineer, Asst. Software Tester, Web Site Developer, Asst. Hardware Technician Data Entry Operator
iv)	Technical Institutes	Laboratory Asst, Asst. Network Administrator, Asst. System Administrator, Programmer, Network Technician, Asst. Hardware Technician

JOB FUNCTIONS

Sr. No.	Designations of the diploma holders in various employment	Job functions
i)	Entrepreneur	• Plan, estimate, procure and install hardware and software systems. • Analyse and design systems • Programming • Testing & Maintenance • Marketing skills
ii)	Asst. Database Administrator	• Identify database requirement planning, designing. • Implementing database design. • Maintaining database server. • Backup recovery.
iii)	Asst. Programmer / Trainee Programmer	• write appropriate algorithm to solve the problem • Implement the design using appropriate software technology / language
iv)	Asst. System / Network Administrator	• Planning & installing Network. • Working in Heterogeneous network. • Implementing switches, Leased lines, Routers, Hubs etc • Backing up data. • Network Security • Web server administration
v)	Web Site Developer	• Study the design of complete system

		• Develop appropriate contents using static or dynamic web publishing technology • Documentation
vi)	Customer Support Engineer	• Communication Skills • Marketing Skills • Test and certify Software systems • Software installation • Trouble shooting of Software and hardware • Network Trouble shooting • Estimation of cost • Solution proving on different aspects

Program objectives

To provide students with a balance of Information Technology theory and practical skills that will enable them to

- work as a professional in the Information Technology industry
- acquire specific knowledge and skills in information technology along with analytical abilities
- become better problem-solvers and innovative thinkers, who are able to learn new skills independently and efficiently and consequently to succeed in a competitive professional environment
- identify information needs appropriate to their area of specialization, and apply the techniques required to gather and interpret such information
- demonstrate skills in the analysis and determination of technological issues at management level
- identify, analyze and solve problems in one or more areas of technology by selecting and using appropriate technology / Language

Competencies

Office Automation Software

- Develop professional documents / graphical representation & presentation using MS-OFFICE & Work with Internet technology.

Programming Languages

- Develop Programs using C Language.
- Develop a sample application using object oriented features of C++.
- Develop a Java Applications using Core Java.
- Develop an application using Visual Basic as front end tool and backend database connectivity.

Database Management System

- Establish Database relationship and design schemas.

- Manage & maintain database using Structured Query Language (SQL) with Oracle.

Web Application

- Create static / Dynamic web pages using appropriate technology.
- Develop a web application using Database Connectivity.
- Develop a VisualBasic.NET Application with ADO.net.
- Develop a Java Application with Oracle Database Connectivity.

Network

- Install, Configure, administer, manage Computer Networks using Windows.
- Troubleshoot and Maintain LAN.

Software Project Planning & Execution

- Apply the Concepts of Software Engineering to implement simple Software Projects.
- Identify Design, Develop and Execute an Industry Related project.
- Testing & maintenance of existing Software projects
- Prepare project report & Documentation.

Soft Skills

- Positive attitude towards work and social responsibility.
- Acquire Presentation & Communication skills
- Acquire Leadership Qualities and working in team

SALIENT FEATURES OF CURRICULUM

- Developing competencies
- Team Building
- Entrepreneurial skills.
- Learning to learn/ Self Learning
- Information collection, processing, use and management.

STRATEGY ADOPTED FOR CURRICULUM DEVELOPMENT

INTRODUCTION

Curriculum development is a dynamic process, which is governed by the contemporary needs of the user-system. All the activities in any academic institution are guided by the curricula operating in the institution. Design of curricula and their implementation therefore requires utmost attention of one and all for its effectiveness.

It was felt that design, review/revision should be based on scientific principles of educational technology and theories of learning and it must reflect the needs, expectations and aspirations of stakeholders/ clients in the technician education system. These needs of user system mainly fall in the following four domains namely

- Personal development domain
- Social development domain
- Continued learning skills domain
- 'Earning to live' or 'Professional Skills' development domain

Curriculum is designed on competency based. All competencies needed for IT diploma holder is first listed. Based on this structure of curriculum is prepared. Attempts have been made in this document to address to the expectations of the user system from the Diploma pass outs. If implemented in right spirit, it would pay much better dividends, it is hoped.

APPROACH TO DESIGN OF CURRICULUM

This Curriculum has been designed on the systematic approach based on competency-based curriculum of educational technology and theories of learning. The data is collected in following ways

- Feedback of alumni
- Feedback of staff
- Past experience of 3 years.
- Through observational records
- By study of documents used in industries, expert reports, newspapers and trade literatures etc., their views on different aspects of the curriculum.
- Through a series of discussions in programme committee.

Taking into account the knowledge, skills/competencies, attitudes etc. required to be possessed by the diploma pass outs the content of different courses is designed.

While designing the curriculum emphasis is given on following points.

- New/emerging technologies being used in the world of work.
- Personal values and social skills required to be possessed.
- Skills related to life-long learning and independent study.
- Professional skills required for different jobs along a career path.

Describing roles/ functions of a technician

A technician, say for example in a medium size engineering enterprise, working at middle level management position may have to carry out jobs in different departments. These are identified as

- Installation, inspection, production & control
- Repair & maintenance
- Marketing and sales
- Purchase & Store
- Observation at Site
- Analysis, Design and Costing.
- Research & development

Designing content of each curriculum area

- Different courses are categorized as
  - Foundation Level
  - Basic Level
  - Allied Level
  - Applied Level
  - Diversified Level
- Curriculum scheme of each course along with course code is given at the beginning
- Competencies to be developed are identified and written.
- Rationale of each course is highlighted.
- Objectives of each course are highlighted and written.
- Content outline in descriptive form was derived. Generally the content outline of a subject was divided into chapters and then from chapters into topic outline.
- Having derived the total content outline i.e. Theory. At the end of the theory content list of practical is added for each course, following were arrived at by consensus-
  - Time required by a teacher to teach the prescribed theory and practical parts
  - Number of courses per term to be taken.
  - Total no. of hours required to teach the entire course.
  - Total no. of lectures and practicals per week.

- Approach to the assessment of student's learning and types of assessment techniques to be used were decided. An assessment scheme was designed, which is a suitable mix of (a) continuous evaluation of term-work (b) progressive test (c) Term end examination.

- Implementation strategies for each subject were identified.

- Learning resources for students were prescribed such as
  - Teacher's lecture notes
  - Basic text-book covering most of the topics in the curriculum and other books
  - Monographs, handbooks, periodicals, articles, journals etc.
  - Data-books, manuals, standards etc

  In all these activities, views of senior teachers regarding relevance of course contents and implementation strategies being presently followed are sought.

PROGRAMME STRUCTURE

SR NO	LEVELS	COMPULSORY COURSES	OPTIONAL COURSES	CREDITS			MARKING SCHEME		
				COMPULSORY	OPTIONAL	TOTAL	COMPULSORY COURSES	OPTIONAL COURSES	TOTAL
1	Foundation	07	Nil	28	--	28	750	--	750
2	Basic	08	Nil	33	--	33	950	--	950
3	Allied	06	02/15	24	04	28	600	--	600
4	Applied	13	01/04	62	05	67	1700	150	1850
5	Diversified	04	01/04	23	05	28	600	150	750
	TOTAL	**39**	**04/23**	**170**	**14**	**184**	**4600**	**300**	**4900**

Scheme at a glance:

Total number of courses offered : 62

Number of Compulsory courses : 39

Number of Optional course : 04 out of 23

Total courses to be opted : 43

Total Marks :4900

LEVEL- I: (FOUNDATION LEVEL COURSES)

Sr No	COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
			TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
01	**5G101**	Basic Mathematics (BMT)	04	--	04	I	20	80	--	--	--	100
02	**5G102**	Engineering Mathematics (EMT)	04	--	04	II	20	80	--	--	--	100
03	**5G103**	Engineering Physics (EPH)	03	02	05	I	20	80	25	25	--	150
04	**5G104**	Engineering Chemistry (ECH)	03	02	05	II	20	80	25	25	--	150
05	**5G105**	Workshop Practice (WSP)	00	03	03	II	--	--	--	50	--	50
06	**5G106**	Engineering Graphics (EGR)	02	02	04	I	--	--	50	50	--	100
07	**5G107**	Basics of Computer Systems (BCS)	01	02	03	I	--	--	50	50	--	100
							100	300	150	200	--	
		TOTAL	**17**	**11**	**28**		**400**		**350**		--	**750**

Note:
'G' Courses are common to all branches
'T' Courses are for Diploma in Information Technology
'S' Courses are common to Diploma in Computer Engineering & Information Technology

Scheme at a glance:

Total number of courses offered : 07

Number of compulsory courses : 07

Number of optional courses : Nil

Total courses to be opted : 07

Total Credits : 28

Total Marks : 750

LEVEL II : (BASIC LEVEL COURSES)

Sr No	COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
			TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
01	**5T201**	'C' Programming (CP)	4	2	6	II	20	80	25	25	--	150
02	**5T202**	Advanced C Programming	3	2	5	III	20	80	25	25	--	150
03	**5S203**	Electrical Technology (ET)	3	2	5	II	20	80	25	25	--	150
04	**5S204**	Basic electronic Devices & Circuit (BEDC)	2	2	4	I	10	40	25	25	--	100
05	**5S205**	Digital Electronics (DE)	3	2	5	II	20	80	--	25	25	150
06	**5S206**	Computer Workshop (CW)	0	2	2	I	--	--	--	50	25	75
07	**5S207**	Software Development Tool	1	3	4	III	--	--	--	50	50	100
08	**5S208**	Web Page Designing Laboratory (WDL)	-	2	2	III	--	--	25	25	--	50
							90	360	125	250	100	
		TOTAL	**16**	**17**	**33**		**450**		**475**			**925**

Note:
'G' Courses are common to all branches
'T' Courses are for Diploma in Information Technology
'S' Courses are common to Diploma in Computer Engineering & Information Technology

Scheme at a glance:

Total number of courses offered : 08

Number of compulsory courses : 08

Number of optional courses : Nil

Total courses to be opted : 08

Total Credits : 33

Total Marks : 950

LEVEL - III: (ALLIED LEVEL COURSES)

Sr No	COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
			TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
01	**5G301**	English (ENG)	2	2	4	I	20	80	--	25	--	125
02	**5G302**	Communication Skills (CMS)	1	2	3	II	--	--	--	50	25	75
03	**5G303**	Entrepreneurship Development (EDP)	2	2	4	IV	--	--	--	25	25	50
04	**5G304**	Environmental Science (EVS)	2	--	2	III	--	--	--	50	--	50
05	**5S301**	Microprocessor & Programming (MPP)	4	2	6	III	20	80	25	25	--	150
06	Management											
	5G305	Industrial Management (INM)	3	2	5	V	20	80	--	25	25	150
07-08	***Any Two of Following (Non-Exam)***											
07	**5G311 To 5G325**	NON-EXAM	--	2	2	II & III	--	--	--	--	--	--
08	**5G311 To 5G325**	NON-EXAM	--	2	2	II & III	--	--	--	--	--	--
							60	240	25	200	75	
	TOTAL		**14**	**14**	**28**		**300**		**300**			**600**

Note:
'G' Courses are common to all branches
'T' Courses are for Diploma in Information Technology
'S' Courses are common to Diploma in Computer Engineering & Information Technology

Scheme at a glance:

Total number of courses offered : 21

Number of compulsory courses : 06

Number of optional courses : 02 out of 15

Total courses to be opted : 08 out of 21

Total Credits : 28

Total Marks : 600

LEVEL-IV : (APPLIED LEVEL COURSES)

Sr No	COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
			TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
01	5S401	Data Structures (DS)	4	2	6	III	20	80	25	25	--	150
02	5S402	Relational Database Management Systems (RDBMS)	4	2	6	III	20	80	25	25	--	150
03	5S403	Computer Networks (CN)	4	2	6	IV	20	80	--	25	25	150
04	5S404	Dot NET Technologies Laboratory (DNTL)	--	4	4	V	--	--	50	50	--	100
05	5T405	Object Oriented Programming using C++ (OOP)	4	2	6	IV	20	80	25	25	--	150
06	5T406	JAVA Programming (JP)	3	2	5	IV	20	80	25	25	--	150
07	5T407	Operating Systems (OS)	4	2	6	V	20	80	25	25	--	150
08	5T408	Software Engineering (SE)	4	--	4	IV	20	80	--	--	--	100
09	5T409	Network Management & Administration (NMA)	1	2	3	VI	--	--	--	50	50	100
10	5S410	Project (PRJ)	--	4	4	VI	--	--	--	100	50	150
11	5S411	Seminar (SMR)	--	2	2	V	--	--	--	50	50	100
12	5T412	Open Source Software Technologies Laboratory (OSSTL)	--	4	4	VI	--	--	50	75	--	125
13	5T413	Computer Security & cyber laws	4	2	6	VI	20	80	--	25	25	150
14												
	5T414	Data Warehousing & Mining (DWM)	3	2	5	V	20	80	--	25	25	150
	5T415	Computer Graphics (CG)	3	2	5	V	20	80	--	25	25	150
	5T416	Bioinformatics	3	2	5	V	20	80	--	25	25	150
	5T417	Human Computer Interface	3	2	5	V	20	80	--	25	25	150
							180	720	225	525	225	
		TOTAL	**35**	**32**	**67**		**900**		**975**			**1875**

Note:
'G' Courses are common to all branches
'T' Courses are for Diploma in Information Technology
'S' Courses are common to Diploma in Computer Engineering & Information Technology

Scheme at glance:

Total number of courses offered : 17

Number of compulsory courses : 13

Number of optional courses : 01 out of 04

Total courses to be opted : 14 out of 17

Total Credits : 67

Total Marks : 1850

DC HOD CDIC

LEVEL-V: (DIVERSIFIED LEVEL COURSES)

Sr No	COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
			TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
01	**5T501**	Multimedia & Animation Techniques (MAT)	3	2	5	V	20	80	25	25	--	150
02	**5T502**	Object Oriented Modeling & Design (OOMD)	4	2	6	VI	20	80	--	25	25	150
03	**5T503**	Software Project Management & Testing (SPMT)	4	2	6	V	20	80	--	25	25	150
04	**5T504**	Mobile Computing (MC)	4	2	6	VI	20	80		25	25	150
05	***Optional Courses (Any One from Group B)***											
	5T505	Advanced JAVA Programming (AJP)	3	2	5	VI	20	80	--	25	25	150
	5T506	Advanced Database Management Systems (ADBMS)	3	2	5	VI	20	80	--	25	25	150
	5T507	IT in Forensic Science	3	2	5	VI	20	80	--	25	25	150
	5T508	Soft Computing (SC)	3	2	5	VI	20	80	--	25	25	150
							100	400	25	125	100	
		TOTAL	**18**	**10**	**28**		**500**		**250**			**750**

Note:
'G' Courses are common to all branches
'T' Courses are for Diploma in Information Technology
'S' Courses are common to Diploma in Computer Engineering & Information Technology

Scheme at glance:

Total number of courses offered : 08

Number of compulsory courses : 04

Number of optional courses : 01 out of 04

Total courses to be opted : 05 out of 08

Total Credits : 28

Total Marks 750

DC HOD CDIC

Sample path

Year-I		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5G101 (BMT) Basic Mathematics (04+00)	**5G102 (EMT)** Engineering Mathematics (04+00)	**5T202** Advanced C programming (3+2)	**5G303 (EDP)** Entrepreneurship Development (02+02)	**5G305 (INM)** Industrial Management (03+02)	**5S410 (PRJ)** Project (00+04)
5G103 (EPH) Engineering Physics (03+02)	**5G104 (ECH)** Engineering Chemistry (03+02)	**5S208 (WDL)** Web Designing Laboratory (00+02)	**5S207 (SDT)** S/W Development Tools (01+03)	**5T407 (OS)** Operating Systems (04+02)	**5T412 (OSSTL)** Open Source Software Technologies Laboratory (00+04)
5G106 (EGR) Engineering Graphics (02+02)	**5G105 (WSP)** Workshop Practice (00+03)	**5S301 (MPP)** Microprocessor & Programming (04+02)	**5S403 (CN)** Computer Networks (04+02)	**5S404 (DNTL)** Dot NET Technologies Laboratory (00+04)	**5T409 (NMA)** Network Management & Administration (01+02)
5G107 (BCS) Basics of Computer Systems (01+02)	**5T201 (CP)** "C" Programming (04+02)	**5G304 (EVS)** Environmental Science (02+00)	**5T405 (OOP)** Object Oriented Programming (04+02)	**5S411 (SMR)** Seminar (00+02)	**5T413** Computer Security & cyber laws (4+2)
5S204 (BEDC) Basic Electronic Devices and Circuits (02+02)	**5G203 (ET)** Electrical Technology (03+02)	**5S401 (DS)** Data Structures (04+02)	**5T406 (JP)** JAVA Programming (03+02)	**5T 501(MAT)** Multimedia & Animation Techniques (03+02)	**5T502 (OOMD)** Object Oriented Modeling & Design (04+02)
5S206 (CW) Computer Workshop (0+02)	**5S205 (DE)** Digital Electronics (03+02)	**5S402 (RDBMS)** Relational Database Management Systems (04+02)	**5T408 (SE)** Software Engineering (04+00)	**5T503 (STPM)** Software Testing & Project Management (04+02)	**5T504 (MC)** Mobile Computing (04+02)
5G301 (ENG) English (02+02)	**5G302 (CMS)** Communication Skill (01+02)	**Any one From 5G311 to 5G325** Non exam credit course (00+02)		**Elective-I (Any one from Group A)**	**Elective – II (Any one from Group B)**
	Any one From 5G311 to 5G325 Non exam credit course (00+02)			**5T414 DWM)** Data Ware housing and Mining (03+02)	**5T505 (AJP)** Advanced JAVA Programming (03+02)
				5T415 (CG) Computer Graphics (03+02)	**5T506 (ADBMS)** Advanced Database Management Systems (03+02)
				5T416(BI) Bioinformatics (03+02)	**5T507** IT in forensic science (03+02)
				5T417 (HCI) Human Computer Interaction (03+02)	**5T508 (SC)** Soft Computing (03+02)
26	**33**	**29**	**29**	**33**	**34**
TOTAL CREDITS = 184					

Curriculum: Information Technology, G. P. Aurangabad

SAMPLE PATH (12th PASS STUDENTS) PCM

Backlog		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5G106 (EGR) Engineering Graphics (02+02)	**5G105 (WSP)** Workshop Practice (00+03)	**5T202** Advanced C programming (3+2)	**5G303 (EDP)** Entrepreneurship Development (02+02)	**5G305 (INM)** Industrial Management (03+02)	**5S410 (PRJ)** Project (00+04)
5G107 (BCS) Basics of Computer Systems (01+02)	**5T201 (CP)** "C" Programming (04+02)	**5S208 (WDL)** Web Designing Laboratory (00+02)	**5S207 (SDT)** S/W Development Tools (01+03)	**5T407 (OS)** Operating Systems (04+02)	**5T412 (OSSTL)** Open Source Software Technologies Laboratory (00+04)
5S204 (BEDC) Basic Electronic Devices and Circuits (02+02)	**5G203 (ET)** Electrical Technology (03+02)	**5S301 (MPP)** Microprocessor & Programming (04+02)	**5S403 (CN)** Computer Networks (04+02)	**5S404 (DNTL)** Dot NET Technologies Laboratory (00+04)	**5T409 (NMA)** Network Management & Administration (01+02)
5S206 (CW) Computer Workshop (0+02)	**5S205 (DE)** Digital Electronics (03+02)	**5S401 (DS)** Data Structures (04+02)	**5T405 (OOP)** Object Oriented Programming (04+02)	**5S411 (SMR)** Seminar (00+02)	**5T413** Computer Security & cyber laws (4+2)
	Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5S402 (RDBMS)** Relational Database Management Systems (04+02)	**5T406 (JP)** JAVA Programming (03+02)	**5T 501(MAT)** Multimedia & Animation Techniques (03+02)	**5T502 (OOMD)** Object Oriented Modeling & Design (04+02)
		Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5T408 (SE)** Software Engineering (04+00)	**5T503 (STPM)** Software Testing & Project Management (04+02)	**5T504 (MC)** Mobile Computing (04+02)
				Elective-I (Any one from Group A)	**Elective – II (Any one from Group B)**
				5T414 DWM) Data Ware housing and Mining (03+02)	**5T505 (AJP)** Advanced JAVA Programming (03+02)
				5T415 (CG) Computer Graphics (03+02)	**5T506 (ADBMS)** Advanced Database Management Systems (03+02)
				5T416(BI) Bioinformatics (03+02)	**5T507** IT in forensic science (03+02)
				5T417 (HCI) Human Computer Interaction (03+02)	**5T508 (SC)** Soft Computing (03+02)
13	**21**	**27**	**29**	**33**	**34**
TOTAL CREDITS = 184 (Exemption credits=27)					

SAMPLE PATH (12th PASS STUDENTS) PCB

Backlog		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5G101 (BMT) Basic Mathematics (04+00)	**5G102 (EMT)** Engineering Mathematics (04+00)	**5T202** Advanced C programming (3+2)	**5G303 (EDP)** Entrepreneurship Development (02+02)	**5G305 (INM)** Industrial Management (03+02)	**5S410 (PRJ)** Project (00+04)
5G106 (EGR) Engineering Graphics (02+02)	**5G105 (WSP)** Workshop Practice (00+03)	**5S208 (WDL)** Web Designing Laboratory (00+02)	**5S207 (SDT)** S/W Development Tools (01+03)	**5T407 (OS)** Operating Systems (04+02)	**5T412 (OSSTL)** Open Source Software Technologies Laboratory (00+04)
5G107 (BCS) Basics of Computer Systems (01+02)	**5T201 (CP)** "C" Programming (04+02)	**5S301 (MPP)** Microprocessor & Programming (04+02)	**5S403 (CN)** Computer Networks (04+02)	**5S404 (DNTL)** Dot NET Technologies Laboratory (00+04)	**5T409 (NMA)** Network Management & Administration (01+02)
5S204 (BEDC) Basic Electronic Devices and Circuits (02+02)	**5G203 (ET)** Electrical Technology (03+02)	**5S401 (DS)** Data Structures (04+02)	**5T405 (OOP)** Object Oriented Programming (04+02)	**5S411 (SMR)** Seminar (00+02)	**5T413** Computer Security & cyber laws (4+2)
5S206 (CW) Computer Workshop (0+02)	**5S205 (DE)** Digital Electronics (03+02)	**5S402 (RDBMS)** Relational Database Management Systems (04+02)	**5T406 (JP)** JAVA Programming (03+02)	**5T 501(MAT)** Multimedia & Animation Techniques (03+02)	**5T502 (OOMD)** Object Oriented Modeling & Design (04+02)
	Any one From 5G311 to 5G325 Non exam credit course (00+02	**Any one From 5G311 to 5G325** Non exam credit course (00+02)	**5T408 (SE)** Software Engineering (04+00)	**5T503 (STPM)** Software Testing & Project Management (04+02)	**5T504 (MC)** Mobile Computing (04+02)
				Elective-I (Any one from Group A)	**Elective – II (Any one from Group B)**
				5T414 DWM) Data Ware housing and Mining (03+02)	**5T505 (AJP)** Advanced JAVA Programming (03+02)
				5T415 (CG) Computer Graphics (03+02)	**5T506 (ADBMS)** Advanced Database Management Systems (03+02)
				5T416(BI) Bioinformatics (03+02)	**5T507** IT in forensic science (03+02)
				5T417 (HCI) Human Computer Interaction (03+02)	**5T508 (SC)** Soft Computing (03+02)
17	**25**	**27**	**29**	**33**	**34**
TOTAL CREDITS = 184 (Exemption credits=19)					

SAMPLE PATH (12th PASS STUDENTS) D9

Backlog		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5G106 (EGR) Engineering Graphics (02+02)	**5T201 (CP)** "C" Programming (04+02)	**5T202** Advanced C programming (3+2)	**5G303 (EDP)** Entrepreneurship Development (02+02)	**5G305 (INM)** Industrial Management (03+02)	**5S410 (PRJ)** Project (00+04)
5S204 (BEDC) Basic Electronic Devices and Circuits (02+02)	**5G203 (ET)** Electrical Technology (03+02)	**5S208 (WDL)** Web Designing Laboratory (00+02)	**5S207 (SDT)** S/W Development Tools (01+03)	**5T407 (OS)** Operating Systems (04+02)	**5T412 (OSSTL)** Open Source Software Technologies Laboratory (00+04)
	5S205 (DE) Digital Electronics (03+02)	**5S301 (MPP)** Microprocessor & Programming (04+02)	**5S403 (CN)** Computer Networks (04+02)	**5S404 (DNTL)** Dot NET Technologies Laboratory (00+04)	**5T409 (NMA)** Network Management & Administration (01+02)
	Any one From 5G311 to 5G325 Non exam credit course (00+02	**5S401 (DS)** Data Structures (04+02)	**5T405 (OOP)** Object Oriented Programming (04+02)	**5S411 (SMR)** Seminar (00+02)	**5T413** Computer Security & cyber laws (4+2)
		5S402 (RDBMS) Relational Database Management Systems (04+02)	**5T406 (JP)** JAVA Programming (03+02)	**5T 501(MAT)** Multimedia & Animation Techniques (03+02)	**5T502 (OOMD)** Object Oriented Modeling & Design (04+02)
		Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5T408 (SE)** Software Engineering (04+00)	**5T503 (STPM)** Software Testing & Project Management (04+02)	**5T504 (MC)** Mobile Computing (04+02)
				Elective-I (Any one from Group A)	**Elective – II (Any one from Group B)**
				5T414 DWM) Data Ware housing and Mining (03+02)	**5T505 (AJP)** Advanced JAVA Programming (03+02)
				5T415 (CG) Computer Graphics (03+02)	**5T506 (ADBMS)** Advanced Database Management Systems (03+02)
				5T416(BI) Bioinformatics (03+02)	**5T507** IT in forensic science (03+02)
				5T417 (HCI) Human Computer Interaction (03+02)	**5T508 (SC)** Soft Computing (03+02)
08	**18**	**27**	**29**	**33**	**34**
TOTAL CREDITS = 184 (Exemption credits=35)					

CT DC HOD CDIC

SAMPLE PATH (12th PASS STUDENTS) C2

Backlog		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5G106 (EGR) Engineering Graphics (02+02)	**5T201 (CP)** "C" Programming (04+02)	**5T202** Advanced C programming (3+2)	**5G303 (EDP)** Entrepreneurship Development (02+02)	**5G305 (INM)** Industrial Management (03+02)	**5S410 (PRJ)** Project (00+04)
5G107 (BCS) Basics of Computer Systems (01+02)	**5G203 (ET)** Electrical Technology (03+02)	**5S208 (WDL)** Web Designing Laboratory (00+02)	**5S207 (SDT)** S/W Development Tools (01+03)	**5T407 (OS)** Operating Systems (04+02)	**5T412 (OSSTL)** Open Source Software Technologies Laboratory (00+04)
5S206 (CW) Computer Workshop (0+02)	**Any one From 5G311 to 5G325** Non exam credit course (00+02)	**5S301 (MPP)** Microprocessor & Programming (04+02)	**5S403 (CN)** Computer Networks (04+02)	**5S404 (DNTL)** Dot NET Technologies Laboratory (00+04)	**5T409 (NMA)** Network Management & Administration (01+02)
		5S401 (DS) Data Structures (04+02)	**5T405 (OOP)** Object Oriented Programming (04+02)	**5S411 (SMR)** Seminar (00+02)	**5T413** Computer Security & cyber laws (4+2)
		5S402 (RDBMS) Relational Database Management Systems (04+02)	**5T406 (JP)** JAVA Programming (03+02)	**5T 501(MAT)** Multimedia & Animation Techniques (03+02)	**5T502 (OOMD)** Object Oriented Modeling & Design (04+02)
		Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5T408 (SE)** Software Engineering (04+00)	**5T503 (STPM)** Software Testing & Project Management (04+02)	**5T504 (MC)** Mobile Computing (04+02)
				Elective-I (Any one from Group A)	**Elective – II (Any one from Group B)**
				5T414 DWM) Data Ware housing and Mining (03+02)	**5T505 (AJP)** Advanced JAVA Programming (03+02)
				5T415 (CG) Computer Graphics (03+02)	**5T506 (ADBMS)** Advanced Database Management Systems (03+02)
				5T416(BI) Bioinformatics (03+02)	**5T507** IT in forensic science (03+02)
				5T417 (HCI) Human Computer Interaction (03+02)	**5T508 (SC)** Soft Computing (03+02)
09	**13**	**27**	**29**	**33**	**34**
TOTAL CREDITS = 184 (Exemption credits =39)					

Curriculum: Information Technology, G. P. Aurangabad

SAMPLE PATH (ITI PASS STUDENTS)

Backlog		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5G107 (BCS) Basics of Computer Systems (01+02)	**5G102 (EMT)** Engineering Mathematics (04+00)	**5T202** Advanced C programming (3+2)	**5G303 (EDP)** Entrepreneurship Development (02+02)	**5G305 (INM)** Industrial Management (03+02)	**5S410 (PRJ)** Project (00+04)
	5T201 (CP) "C" Programming (04+02)	**5S208 (WDL)** Web Designing Laboratory (00+02)	**5S207 (SDT)** S/W Development Tools (01+03)	**5T407 (OS)** Operating Systems (04+02)	**5T412 (OSSTL)** Open Source Software Technologies Laboratory (00+04)
	5G203 (ET) Electrical Technology (03+02)	**5S301 (MPP)** Microprocessor & Programming (04+02)	**5S403 (CN)** Computer Networks (04+02)	**5S404 (DNTL)** Dot NET Technologies Laboratory (00+04)	**5T409 (NMA)** Network Management & Administration (01+02)
	Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5S401 (DS)** Data Structures (04+02)	**5T405 (OOP)** Object Oriented Programming (04+02)	**5S411 (SMR)** Seminar (00+02)	**5T413** Computer Security & cyber laws (4+2)
		5S402 (RDBMS) Relational Database Management Systems (04+02)	**5T406 (JP)** JAVA Programming (03+02)	**5T 501(MAT)** Multimedia & Animation Techniques (03+02)	**5T502 (OOMD)** Object Oriented Modeling & Design (04+02)
		Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5T408 (SE)** Software Engineering (04+00)	**5T503 (STPM)** Software Testing & Project Management (04+02)	**5T504 (MC)** Mobile Computing (04+02)
				Elective-I (Any one from Group A)	**Elective – II (Any one from Group B)**
				5T414 DWM) Data Ware housing and Mining (03+02)	**5T505 (AJP)** Advanced JAVA Programming (03+02)
				5T415 (CG) Computer Graphics (03+02)	**5T506 (ADBMS)** Advanced Database Management Systems (03+02)
				5T416(BI) Bioinformatics (03+02)	**5T507** IT in forensic science (03+02)
				5T417 (HCI) Human Computer Interaction (03+02)	**5T508 (SC)** Soft Computing (03+02)
03	**17**	**27**	**29**	**33**	**34**
TOTAL CREDITS = 184 (Exemption credits=41)					

SAMPLE PATH (MCVC PASS STUDENTS)

Backlog		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5S204 (BEDC) Basic Electronic Devices and Circuits (02+02)	**5G102 (EMT)** Engineering Mathematics (04+00)	**5T202** Advanced C programming (3+2)	**5G303 (EDP)** Entrepreneurship Development (02+02)	**5G305 (INM)** Industrial Management (03+02)	**5S410 (PRJ)** Project (00+04)
	5T201 (CP) "C" Programming (04+02)	**5S208 (WDL)** Web Designing Laboratory (00+02)	**5S207 (SDT)** S/W Development Tools (01+03)	**5T407 (OS)** Operating Systems (04+02)	**5T412 (OSSTL)** Open Source Software Technologies Laboratory (00+04)
	5G203 (ET) Electrical Technology (03+02)	**5S301 (MPP)** Microprocessor & Programming (04+02)	**5S403 (CN)** Computer Networks (04+02)	**5S404 (DNTL)** Dot NET Technologies Laboratory (00+04)	**5T409 (NMA)** Network Management & Administration (01+02)
	5S205 (DE) Digital Electronics (03+02)	**5S401 (DS)** Data Structures (04+02)	**5T405 (OOP)** Object Oriented Programming (04+02)	**5S411 (SMR)** Seminar (00+02)	**5T413** Computer Security & cyber laws (4+2)
	Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5S402 (RDBMS)** Relational Database Management Systems (04+02)	**5T406 (JP)** JAVA Programming (03+02)	**5T 501(MAT)** Multimedia & Animation Techniques (03+02)	**5T502 (OOMD)** Object Oriented Modeling & Design (04+02)
		Any one From 5G311 to 5G325 Non exam credit course (00+02)	**5T408 (SE)** Software Engineering (04+00)	**5T503 (STPM)** Software Testing & Project Management (04+02)	**5T504 (MC)** Mobile Computing (04+02)
				Elective-I (Any one from Group A)	**Elective – II (Any one from Group B)**
				5T414 DWM) Data Ware housing and Mining (03+02)	**5T505 (AJP)** Advanced JAVA Programming (03+02)
				5T415 (CG) Computer Graphics (03+02)	**5T506 (ADBMS)** Advanced Database Management Systems (03+02)
				5T416(BI) Bioinformatics (03+02)	**5T507** IT in forensic science (03+02)
				5T417 (HCI) Human Computer Interaction (03+02)	**5T508 (SC)** Soft Computing (03+02)
04	**22**	**27**	**29**	**33**	**34**
TOTAL CREDITS = 184 (Exemption credits =35)					

SEMESTER-I (FIRST)

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
		TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
5G101	Basic Mathematics (BMT)	4	--	4	I	20	80	--	--	--	100
5G103	Engineering Physics (EPH)	3	2	5	I	20	80	25	25	--	150
5G106	Engineering Graphics (EGR)	2	2	4	I	--	--	50	50	--	100
5G107	Basics of Computer Systems (BCS)	1	2	3	I	--	--	50	50	--	100
5S204	Basic Electronic Devices & Circuits (BEDC)	2	2	4	I	10	40	25	25	--	100
5S206	Computer Workshop (CW)	0	2	4	I	--	--	--	50	25	75
5G301	English (ENG)	2	2	4	I	20	80	--	25	--	125
	TOTAL	**14**	**12**	**26**		**70**	**280**	**150**	**225**	**25**	**750**

SEMESTER-II (SECOND)

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
		TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
5G102	Engineering Mathematics (EMT)	4	--	4	II	20	80	--	--	--	100
5G104	Engineering Chemistry (ECH)	3	2	5	II	20	80	25	25	--	150
5G105	Workshop Practice (WSP)	0	3	3	II	--	--		50	--	50
5T201	'C' Programming (CP)	4	2	6	II	20	80	25	25	--	150
5S203	Electrical Technology (ET)	3	2	5	II	20	80	25	25	--	150
5S205	Digital Electronics (DE)	3	2	5	II	20	80	--	25	25	150
5G302	Communication Skills (CMS)	1	2	3	II	--	--	--	50	25	75
5G311 To 5G325	NON EXAM	0	2	2	II	--	--	--	--	--	--
	TOTAL	**18**	**15**	**33**		**100**	**400**	**75**	**200**	**50**	**825**

SEMESTER-III (THIRD)

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
		TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
5T202	Advanced C Programming	3	2	5	III	20	80	25	25	--	150
5S208	Web Designing Laboratory (WDL)	-	2	2	III	--	--	25	25	--	50
5S301	Microprocessor & Programming (MPP)	4	2	6	III	20	80	25	25	--	150
5G304	Environmental Science (EVS)	2	--	2	III	--	--	--	50	--	50
5S401	Data Structures (DS)	4	2	6	III	20	80	25	25	--	150
5S402	Relational Database Management System (RDBMS)	4	2	6	III	20	80	25	25	--	150
5G311 To 5G325	NON EXAM	0	2	2	III	--	--	--	--	--	--
	TOTAL	**17**	**12**	**29**		**80**	**320**	**125**	**175**	**--**	**700**

SEMESTER-IV (FOURTH)

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
		TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
5G303	Entrepreneurship Development (EDP)	2	2	4	IV	--	--	--	25	25	50
5S207	S/W Development Tools (SDT)	1	3	4	IV	--	--	--	50	50	100
5S403	Computer Networks (CN)	4	2	6	IV	20	80	--	25	25	150
5T405	Object oriented programming using C++	4	2	6	IV	20	80	25	25	--	150
5T406	JAVA Programming (JP)	3	2	5	IV	20	80	25	25	--	150
5T408	Software Engineering (SE)	4	--	4	IV	20	80	--	--	--	100
	TOTAL	**18**	**11**	**29**		**80**	**320**	**50**	**150**	**100**	**700**

SEMESTER-V (FIFTH)

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
		TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
5G305	Industrial Management (INM)	3	2	5	V	20	80	--	25	25	150
5T407	Operating Systems (OS)	4	2	6	V	20	80	25	25	--	150
5S404	Dot NET Technologies Laboratory (DNTL)	--	4	4	V	--	--	50	50	--	100
5S411	Seminar (SMR)	--	2	2	V	--	--	--	50	50	100
5T501	Multimedia & Animation Techniques (MAT)	3	2	5	V	20	80	25	25	--	150
5T503	Software Testing & Project Management (STPM)	4	2	6	V	20	80	--	25	25	150
Optional Courses (Any One from Group A)											
5T414	Data Warehousing & Mining (DWM)	3	2	5	V	20	80	--	25	25	150
5T415	Computer Graphics (CG)	3	2	5	V	20	80	--	25	25	150
5T416	Bioinformatics	3	2	5	V	20	80	--	25	25	150
5T417	Human Computer Interface	3	2	5	V	20	80	--	25	25	150
	TOTAL	**17**	**16**	**33**		**100**	**400**	**100**	**225**	**125**	**950**

SEMESTER-VI (SIXTH)

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
		TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
5S410	Project (PRJ)	--	4	4	VI	--	--	--	100	50	150
5T409	Network Management & Administration (NMA)	1	2	3	VI	--	--	--	50	50	100
5T412	Open Source Software Technologies Laboratory (OSSTL)	--	4	4	VI	--	--	50	75	--	125
5T413	Computer Security & cyber laws	4	2	6	VI	20	80	--	25	25	150
5T502	Object Oriented Modeling & Design (OOMD)	4	2	6	VI	20	80	--	25	25	150
5T504	Mobile Computing (MC)	4	2	6	VI	20	80	--	25	25	150
Optional Courses (Any One from Group B)											
5T505	Advanced JAVA Programming (AJP)	3	2	5	VI	20	80	--	25	25	150
5T506	Advanced Database Management Systems (ADBMS)	3	2	5	VI	20	80	--	25	25	150
5T507	IT in Forensic Science	3	2	5	VI	20	80	--	25	25	150
5T508	Soft Computing (SC)	3	2	5	VI	20	80	--	25	25	150
	TOTAL	**16**	**18**	**34**		**80**	**320**	**50**	**325**	**200**	**975**

Course Code: 5G101 Course Name: BASIC MATHEMATICS (MATHS)

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	00	Max.Marks	20	80	--	--	--	100
TOTAL	04	Duration	1.00	3.00	--	--	--	--

RATIONALE:

The subject is classified under basic sciences and intends to teach students basic facts, concepts and principles of mathematics, as a tool to analyze Engineering problems. Mathematics lies down the foundation to understand core technology subjects.

COMPETENCY STATEMENT(S):

To inculcate the practice of mathematic
Comprehend the principles of other subjects
Solve problems by using analytical and systematic approach.
The students will be able to:
Develop process of logical thinking

COURSE CONTENTS:-

Sr.no.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1.	**Algebra** **1. logarithms** **1.1 Defination natural and common logarithams.** 1.2 Laws of logarithams 1.3 Simple numericals. On logarithams	04	04
2.	**Determinant** 2.1 Definition of Determinant, Order of Determinant 2.2 Expansion of Determinant of order 2and3 2.3 Properties of Determinant 2.4Cramer's Rule (solution of simultaneous equations in two and three Unknowns)	08	08
3.	**Partial fractions** 3.1Definition of Partial fraction, proper and improper fractions, rational fractions 3.2 To resolve given rational fraction into partial fractions 3.3 Denominator containing Non repeated linear factors 3.4 Denominator containing repeated linear factors	06	08

	3.5 Denominator containing irreducible non-repeated Quadratic factors		
4.	**Matrices** 4.1 Definition of matrix: Type of matrix: viz.- null, row, column, square, diagonal, scalar, unit, Triangular. 4.2 Algebra of matrices –addition, subtraction and Multiplication 4.3 Transpose of a matrix 4.4 Adjoint of a matrix 4.5I nverse of matrix by adjoint method	**08**	**10**
5.	**Trigonometry** 5.1 Trigonometric ratios of allied, compound and multiple angles 5.2 Trigonometric Ratios of allied angles 5.3 Trigonometric Ratios of compound angles 5.4 Trigonometric Ratios of multiple angles Product, sum and difference formulae 5.5 Sub-multiple angles.	**10**	**16**
6.	**Inverse circular functions** 6.1 Definition of Inverse circular functions 6.2 Principle values of Inverse circular functions 6.3 Simple problems	**04**	**08**
7.	**Properties of Triangles** 7.1 Sine rule, Cosine rule, 7.2 Tangent rule(without proof)Simple problems	**06**	**06**
8.	**Calculus** 8.1Cartesian products of sets. 8.2Definition of relation,definition of fuction, real value fuction,domain,co-domain of a fuction. 8.3 Types of Fuctions. 8.4 value of the fuction at given point. 8.5 composite fuction.	**08**	**08**
9.	**Limits** 9.1Definition and concept of limit Limits of algebraic functions 9.2 Limits of trigonometric functions 9.3 Limits of exponential functions 9.4 Limits of logarithmic functions	**10**	**12**

CT DC HOD CDIC

TEXT B00KS

Sr. No	Title of Book	Author and Publication
1	Mathematics for polytechnic students for first year	By S.P.Deshpande
2	Mathematics for polytechnic students for first year	By G.V.Kumbhojkar
3	Mathematics for polytechnics	By TTTI Bhopal
4	Applied Mathematics	By Gore and Patil
5	Trigonometry Part I	By Loney

Course Code: 5G102 **Course Name: Engineering Mathematics**

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	00	Max.Marks	20	80	--	--	--	100
TOTAL	04	Duration	1.00	3.00	--	--	--	--

RATIONALE:

The subject is classified under basic sciences and intends to teach students basic facts, concepts and principles of mathematics, as a tool to analyze Engineering problems. Mathematics lies down the foundation to understand core technology subjects.

COMPETENCY STATEMENTS:

To inculcate the practice of mathematic
Comprehend the principles of other subjects
Solve problems by using analytical and systematic approach.

COURSE CONTENTS:-

	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Derivatives** 1.1 Definition of derivative, notation. 1.2 Derivative of standard functions. 1.3 Rules of Differentiation (without proof) such aS sum, difference, product and quotient. 1.4 Derivative of composite functions. 1.5 Derivative of inverse trigonometric functions. 1.6 Derivative of implicit functions. 1.7 Derivative of parametric functions. 1.8 Logarithmic differentiation. 1.9 Second order derivatives. 1.10 Simple applications of derivative such as equation of Tangent & normal, maxima & minima, radius of Cur vature.	18	26
2	**Integration** 2.1 Definition of integration. 2.2 Integration of standard function. 2.3 Rules of Integration: sum, difference & multiplication. 2.4 Methods of Integration. 2.4.1 Integration by substitution. 2.4.2 Integration by partial fraction. 2.4.3 Integration by parts. 2.5 Definition of Definite integral. 2.6 Simple problems on definite integral.	18	22
	Differential Equations 3.1 Definition of differential equation, order &degree.	14	16

3	3.2 Formation of differential equation. 3.3 Solution of Diff. equation. 3.3.1 variable separable. 3.3.2 Homogeneous equation. 3.3.3 Exact diff. equation. 3.3.4 Linear diff. equation.		
4	**Statistics** 4.1 Graphical representation: Histogram & give curve to find Mode and median. 4.2 Measures of dispersion : Range, mean deviation and Standard deviation	06	08
5	**Probability.** 5.1 Introduction & definitions of different terms permutation & combination. 5.2 Definition of probability. 5.3 Addition Theorem of probability. 5.4 Multiplication Theorem. 5.5 Conditional probability.	08	08

TEXT BOOKS"

S.No.	Name of Book	Author	Publication
1.	Mathematicsfor polytechnic students for second Year	S. P. Deshpande	Dhanpatrai publishing Co.
2.	Applied Mathematics	ByPatel & Rawal	S. Chand & Co., N. Delhi
3.	Fundamentals of Mathematical statistics	S.C.Gupta & Kapoor	Pune vidhyarti graham prakshan

CT DC HOD CDIC

Course code:-5G103 **Course Name:- ENGINEERING PHYSICS**

Teaching scheme		Evaluation scheme						
TH	03		PT	TEE	TW	PR	OR	TOTAL
PR	02	MAX MARKS	20	80	25	25	--	150
TOTAL	05	DURATION	01	03				

Rationale:

Physics provides foundation for core technology subjects. Understanding of any subject is entirely depending on logical thinking and hierarchy of knowledge component. As Physics is considered as basic science its principles, laws, hypothesis, concepts, ideas are playing important role in reinforcing the knowledge of technology. Deep thought is given while selecting topics in physics. They are different for different groups. This will provide sound background for self-development in future to cope up with new innovations. Topics are relevant to particular programme and student will be motivated to learn and can enjoy the course of Physics as if it is one of the subjects of their own stream.

Competency statement : The Student will be able to:

1. Analyze different factors on which capacitance depends.
2. Differentiate between field intensity and potential.
3. List advantages of optical fiber.
4. Describe principle of working of optical fiber.
5. Differentiate between conductor, insulator and semiconductor on the

Topic no	contents	hrs	marks
01	**01 UNITS AND MEASUREMENTS** **1.1 Definition of unit , requirements of standard unit, ,fundamental and derived quantities and their units** **1.2** Definition of accuracy, precision and error, estimation of errors -absolute error, relative error and percentage error, rules and identification of significant figures. **1.3** Scalars & Vectors: Definition, laws of Vectors (Law of Triangle, law of parallelogram). **(Numerical on percentage error and significant figures, Law of parllelograms)**	**07**	**12**

02	**KINEMATICS** **2.1 Angular Motion:** Definition of Angular displacement, angular velocity, angular acceleration, Relation between angular velocity and angular acceleration, definition of S.H.M **2.2 Kinetics:** Definition of momentum,impulse,impulsive force, Statements of Newton's laws of motion with equations, Application of laws of motion-Recoil of gun, Motion of two connected bodies by light inextensible string passing over smooth pulley, motion of lift. **2.3 work power & energy.** Definition of work, power & energy equation for potential energy & kinetic energy, work done by a torque.	**08**	**10**
03	**GENERAL PROPERTIES OF MATTER** **3.1 Elasticity** Deforming force, restoring force, elastic and plastic body, stress and strain with their types. Elastic limit, Hooke's law, Young's modulus, bulk modulus, modulus of rigidity and relation between them (no derivation), **(Numerical on stress, strain and Young's modulus)** **3.2 Surface Tension.** Molecular force, cohesive and adhesive force, Molecular range , sphere of influence, Laplace's molecular theory, Definition of surface tension and its S.I.unit,angle of contact, capillary action with examples,relation between surface tension , capillary rise and radius of capillary (no derivation),effect of impurity and temperature on surface tension **(Numerical on relation between surface tension, capillary rise and radius)** **3.3 Viscosity** Viscous force, Definition of viscosity, velocity gradient, Newton's law of viscosity, coefficient of viscosity and its S.I. unit, free fall of spherical body through viscous medium (no derivation) terminal velocity, Stokes law (statement and formula). **(Numerical on coefficient of viscosity and Stroke's formula)**	**14**	**20**
04	**HEAT** **4.1 Transmission of heat and expansion of solids** Three modes of transmission of heat -conduction, convection and radiation,steady state coefficient of Thermal conductivity and its S.I. unit, Definition of linear,	**02**	**04**

	Aerial and cubical expansion and relation between them.(no derivation)		
05	**LIGHT, LASER and SOUND** **5.1 Properties of light** Reflection, refraction, and their laws, Snell's law, physical significance of refractive index, definition of dispersion, polarization and diffraction of light along with ray diagram **5.2 LASER** Properties of laser,absorption, spontaneous and stimulated emission, population inversion,optical pumping,active system(concept and definations) construction and working of He-Ne laser,application of lasers(medical and engineering) **5.3 Sound** Definition of wave motion, amplitude, period, frequency, and wavelength, relation between velocity, frequency and wavelength , equation of progressive wave (no derivation), longitudinal and transverse wave, comparison, forced and free vibrations, definition of resonance with examples, formula for velocity of sound with end correction (no derivation) **(Numerical on relation v = nλand resonance)**	**06**	**12**
06	**ELECTROSTATICS** **6.1 ELECTROSTATICS** Coulomb's Inverse square law, intensity of electric field, Electric lines of force & their properties, flux, flux density. Statement and general equation of Ohms law - Resistances in series & parallel Specific resistance ,Principle of Wheatstone's bridge. Principle of potentiometer **6.2 ELECTRIC POTENTIAL AND ELECTRIC CAPACITANCE:** Principle of capacitance and its unit, condensers in series & parallel, **(Numericals on condensers)**	**04**	**08**
07	**SEMICONDUCTORS:** Classification of conductors,insulators,semiconductors on the basis of energy bands ,p-type & n-type semiconductor, p-n junction diode and biasing of p-n junction diode (forward and reverse)	**03**	**06**
08	**MODERN PHYSICS.** **8.1 Photo electricity** Concept of photon, Plank's hypothesis, properties of photon, photo electric effect, Characteristics of photoelectric effect, work function, Einstein's photoelectric equation(no derivation), photoelectric cell- applications. **(Numerical on Energy of photon, work function, Photoelectric equation)**	**04**	**08**

	8.2 X-rays Introduction to x-rays, types of x-rays ,production of x-rays using Coolidge tube, minimum wavelength of x-rays,(no derivation) properties of x-rays, engineering, medical and scientific applications. **(Numerical on minimum wavelength of x-rays)**		

PRACTICALS

Skills to be developed

1) Intellectual skills-

_ Proper selection of measuring instruments on the basis of range, least count, precision and accuracy required for measurement.
_ Analyze properties of matter & their use for the selection of material.
_ To verify the principles, laws, using given instruments under different conditions.
_ To read and interpret the graph.
_ To interpret the results from observations and calculations.
_ To use these results for parallel problems.

2) Motor skills-

_ Proper handling of instruments.
_ measuring physical quantities accurately.
_ To observe the phenomenon and to list the observations in proper tabular form.
_ To adopt proper procedure while performing the experiment.
_ To plot the graphs.

List of Experiments:

1) To know your Physics Laboratory.
2) To use Vernier Calliper for the measurement of dimensions of given object.
3) To use Micrometer Screw Gauge for the measurement of dimensions (Thickness, Diameter) of given object.
4) To verify Hooke's Law by Searle's method and to calculate Young's modulus of elasticity of steel wire.
5) To verify Law of Parallelogram.
6) To determine coefficient of viscosity of given fluid (Glycerin) using Stoke's Method.
7) To determine the velocity of sound by using resonance tube.
8) Determination of specific resistance by Voltmeter-Ammeter method.
9) Detemination of Law of resistance in Parallel by meterbridge.
10) Comparision of E.M.F by Single Cell method.
11) Detemination of Law of resistance in series by meterbridge.

Reference books

1 Physics-I ,V. RajendranTata McGraw- Hill publication, New Delhi
2 Applied physics BY ,Arthur Beiser,Tata McGraw- Hill raw- Hill Publication, New Delhi
3 Engineering Physics by R.K.Gaur and S.L.Gupta Dhanpat Rai Publication New Delhi.
4 Fundamentals of Physics Resnick ,Halliday & Walker ,Wiley India Pvt. Ltd
5 Applied physics by G.B. Bhandarkar.Nirali publication.
6 Basic physics by Pawar and Sutar Nirali Publication
7 S Chand's Basic Physics

Course Code: 5G104 Course Name: ENGINEERING CHEMISTRY (CHEM)

Teaching scheme		Evaluation scheme						
TH	**03**		**PT**	**TEE**	**TW**	**PR**	**OR**	**TOTAL**
PR	**02**	**MAX MARKS**	**20**	**80**	**25**	**25**	**--**	**150**
TOTAL	**05**	**DURATION**	**01**	**03**				

RATIONALE:

Chemistry is a basic science subject which is essential to all engineering courses. It gives knowledge of engineering materials, their properties, related applications & selection of materials for engineering applications. Due to technological progress there are hazardous effects on environment & human life. The core knowledge of environmental effects will bring awareness in students about the precautions & preventions to be taken to reduce the ill effects. This subject will generate curiosity of carrying out further development in engineering field

COMPETANCEY STATEMENT:

The student will be able to:

1. Draw the orbital configuration of different elements.
2. Represent the formation of molecules schematically.
3. Describe the mechanism of electrolysis.
4. Identify the properties of metals & alloys related to engineering applications.
5. Identify the properties of non metallic materials, related to engineering applications.
6 Select a proper material for specific purpose.

Topic no	Contents	HRS	MARKS
1	**Atomic structure** 1.1 Definition of Atom, element, molecule , introduction to different atomic theories, 1.2 Bohr's atomic theory, Fundamental Particles of Atom their Mass ,Charge, Location, 1.3 Atomic no, Atomic Mass no. numerical problems on it , orbit & orbitals, 1.4 Electronic configuration , electronic configuration of first 30 elements	**08**	**10**

	1.5, Isotopes & Isobars, 1.6 Inert gases, Their characteristics ,electronic configuration 1.7 Molecule formation: valency, types of valency, electrovalency co valency. Its examples.Formation of Electrovalent compounds e.g. Nacl, CaCl2, formation of Covalent Compounds H2O, Cl2, C2H4, C2H2.		
02	**Electrochemistry** 2.1 Definition & differentiation of Atom, Ion. 2.2 Ionisation & Electrolytic dissociation, Arrhenius Theory of Ionisation, Degree of Ionisation & factors affecting degree of ionization. 2.3 Introduction of Conductors, Insulators, Dielectrics, Electrolyte, NonElectrolyte, 2.4 Electrolysis, Electrolytic Cell, Electrodes. Mechanism of Electrolysis 2.5 Electrochemical Series for Cations & Anions, 2.6 Electrolysis of CuSO4 Solution by using Cu Electrode & Platinum Electrode 2.7 Faraday's first & second law of Electrolysis & numerical problems on it Applications of Electrolysis such as Electroplating & Electrorefining 2.8 Electrochemical Cells & Batteries , Types of cell Primary & secondary cell construction Working & Applications of Dry cell & Lead – Acid Storage,	**06**	**12**

CT DC HOD CDIC

03	**METALLURGY** **3.**1 Definition of Metallurgy, Mineral, Ore, Gangue, Flux & Slag, Occurrence of Metals, 3.2 Mechanical Properties of metals such as Hardness, Toughness, Ductility, Malleability, Tensile strength, 3.3 Stages of Extraction of Metals from its Ores in detail i.e. Crushing, Concentration, methods of concentration (physical and chemical) 3.4 Reduction of iron in blast furnace with chemical reactions, Reactions in zone of reduction and zone of absorption, 3.5 Alloys Definition of Alloy, Purposes of Making alloy. 3.6 Methods of Preparation of alloy such as fusion method. 3.7 Classification of Alloys ,ferrous alloys & Non Ferrous alloys, their examples. 3.8Composition, Properties & Applications of Alnico, Duralumin, Dutch Metal, German Silver / Nickel Silver, Gun Metal, Monel metal, Wood's Metal	**08**	**14**
04	**Corrosion of metals and its protection** 4.1 corrosion Definition of corrosion, Types of corrosion 4.2 Atmospheric corrosion or dry Corrosion, corrosion due to oxygen , different film formation , 4.3 Immersed Corrosion or Electrochemical Corrosion, oxygen absorption Mechanism , Hydrogen evolution mechanism 4.4 Protection of Metals from corrosion. Purification of Metals from corrosion, Alloy Formation, Cathode Protection Appling Protective Coatings like metal coating by Galvanising, Tinning, Electroplating.	**06**	**08**
05	**WATER** 5.1 Sources of water, impurities in water, 5.2 Hard water & soft water, types of hardness, causes of hardness, 5.3 Effects of hard water in boiler, scale & sludge formation in boiler its effects on boiler, 5.4 Effects of hard water in diff. industries and domestic purposes, 5.5 Softening of hard water by soda lime process, permutite process, ion exchange process,	**07**	**10**

	5.6 Potable water its condition for portability, 5.7 Diff. methods of purification of water		
06	**Non Metallic Materials** 6.1 Plastics Definition of Plastic, Formation of Plastic by Addition Polymerisation with example such as Polyethylene 6.2 Condensation Polymerisation with suitable example such as Bakelite plastic. 6.3Types of Plastics, Thermo softening & Thermosetting Plastic, 6.4 Compounding of Plastics – Resins, Fillers, binders ,Plasticizers, Accelerators, Pigments etc. .Engineering properties of plastic and its related uses. 6.5 Rubber Natural Rubber, Its Processing, Drawbacks of Natural Rubber, 6.6 Vulcanisation of Rubber with Chemical Reaction. 6.7 Synthetic Rubber its examples Buna –S & Buna –N rubber, Distinction Between Natural & synthetic rubber. 6.8 Properties of rubber such as Elasticity ,Tack, resistant to abrasion, Rebound capacity. 6.9 Engineering Applications of rubber based on their properties. 6.10 Thermal Insulating Materials Definition & Characteristics of Thermal insulators. Preparation, Properties & Applications of Thermocole & glass wool, cork, asbestos.	07	18
07	**Lubricants-** 7.1 Definition of lubricant, lubrication, 7.2 functions of lubricants ,need of lubrication 7.3 Classification of lubricants with examples, 7.4 Mechanism of Lubrication by Fluid Film, Boundary& Extreme Pressure, 7.5 Physical Characteristics of Lubricants Such as Viscosity, Viscosity Index, Oiliness, Volatility, Flash & Fire Point, Cloud & Pour Point. 7.6 Chemical Characteristics such as Acid Value , Neutralization Number, Emulsification, Saponification Value, Selection of proper Lubricants for Various Types of Machines.	06	08

CT DC HOD CDIC

List of practicals (ANY 10 SHOULD BE PERFORM)

01) Orbital configuration of different elements (at least 10 elements)
02) To verify Faraday's first Law of electrolysis.
03) To determine neutralization point of acetic acid (weak acid) and ammonium hydroxide (Weak base). calculate the normality and strength of acetic acid.
04) To determine the equivalent point of precipitation titration of BaCl2 with H2SO4 using Conductivity Meter. To find the normality and strength of BaCl2
05) To find the strength in grams per liter of the given solution (NaOH) with the help of standard hydrochloric acid.
06) To determine pH value of given solutions, water samples, by using pH paper, universal indicator and pH meter.
07) To determine the strength of given hydrochloric acid solution by titrating it against standard potassium hydroxide solution.
08) To determine percentage of iron from steel by titration method.
09) To determine the hardness of potable water and boiler feeding water.
10) To determine the chloride content potable water and boiler feeding water.
11) Preparation of phenol formaldehyde plastic.
12) To determine the acid value of oil sample by neutralization method.
13) Qualitative analysis of given salt solutions, i.e. to determine one acidic and one basic radical from given salt solution. (At least 05 salt solutions.)

TEXT BOOKS:

S.No.	Name of Book	Author	Publication
1.	**chemistryof engineering materials**	**S.S.Narkhede**	**Nirali publication**
2.	**chemistry of engineering materials**	**Shane patil**	**Tata tech publication**
3	**chemistry of engineering materials**	**Jawale**	**Mc vranda publication. Inc.**

REFERENCE BOOKS:

S.No.	Name of Book	Author	Publication
1.	Engineering Chemistry	Jain & Jain	**Dhanpat Rai and Sons** Co.
2.	**Engineering Chemistry**	R.S. **S. S. Dara**	S. N. **S. S. Chand Publication**
3.	**nvironmental Chemistry & PollutionControl**	**S. S. Dara**	**S.Chand Publication**

CT DC HOD CDIC

COURSE CODE: 5G105 **COURSE NAME: WORKSHOP PRACTICE (WP)**

Teaching Scheme		Evaluation Scheme						
TH	00		PT	TEE	TW	PR	OR	Total
PR	03	Max. Marks	--	--	50	--	--	50
TOTAL	03	Duration	--	--	--	--	--	--

RATIONALE:

The knowledge of different basic tools and different processes such as smithy, forging, carpentry, welding, plumbing, fitting etc. is the basic requirement of the diploma technician. These are the basic & fundamental operations encountered in workshop. At this level it is essential to impart the practical feel of these basic operations & processes to the students. With this intention this course is being introduced.

COMPETENCY STATEMENTS:

1. To understand use of different hand tools and workshop processes.
2. To perform basic workshop processes such as smithy, forging, carpentry, welding, plumbing, fitting.

TERM WORK:

1) Smithy & Forging: - One job involving cutting, bending, drawing down/ up operations.
2) Carpentry: - One Job involving Different types of carpentry joints (min. two joints) used in furniture, wooden items with the use of teak wood, combination of wood & steel frames, plywood, sun mica.
3) Welding: - One job welded joint involving operations such as Lap, Butt welding with the help of Arc Welding machine
4) Fitting & Filling: - Fitting and filing one job involving filing, chamfering, drilling, tapping etc. operations
5) Plumbing: - One practical job on pipe fitting and threading

Job diary, drawing of different types of tools , operations are to be submitted by each candidate.

TEXT BOOK:

Sr.No	Title and Edition	Author	Publisher
1	Workshop technology Vol. 1	B.S. Raghuwanshi	
2	Workshop technology Vol. 1	S.K. Hajra Choudhary	
3	Production technology	R.K. Jain.	

CT DC HOD CDIC

COURSE CODE: 5G106 COURSE NAME: ENGINEERING GRAPHICS (EG)

Teaching Scheme		Evaluation Scheme						
TH	02		PT	TEE	TW	PR	OR	Total
PR	02	Max. Marks	--	--	50	50	--	100
TOTAL	04	Duration	--	--	--	2.00	--	--

RATIONALE:

Engineering drawing (Graphics) is the language of engineers. Often it is required to imagine the different objects from various directions, sound knowledge of engineering graphics will help the engineer to represent various objects and read various drawings used in workshop, industry and in various manufacturing processes.

COMPETENCY STATEMENT:

To understand the basic principles of Engineering Drawing

COURSE CONTENTS:

Topic No.	Content	Hours	Marks
1.	**Introduction** 1.1 Drawing Instruments and their uses 1.2 Letters and numbers (single stroke vertical) for main title, sub-title and normal use 1.3 Different types of lines, Convention of lines and their applications. 1.4 Scale (reduced, enlarged & full size), Plain scale and Diagonal scale. 1.5 Sheet sizes and layout, Geometrical constructions 1.6 Dimensioning, its methods, parallel and chain dimensioning, radius and diameter dimensioning, leader and its use, dimension with text	04	00
2.	**Simple Drawing Practices** 2.1 Drawing of different circles with thin, thick, center line use, dividing circle into number of equal parts, dividing line into equal parts 2.2 Drawing pentagon, hexagon and rhombus, drawing correct arrows to dimension lines, drawing tangent to circle from given point	04	00
3.	**Engineering Curves** 3.1 To draw ellipse by – a) Arcs of circle method b) Concentric circle method c) Oblong method 3.2 To draw parabola by – a) Directrix focus method b) Rectangle method 3.3 To draw hyperbola by – a) Transverse axis & focus method. b) Passing through a given point. (Rectangular hyperbola)	08	00

	3.4 To draw involute of square, hexagon and circle. 3.5 To draw cycloid, epicycloid, hypocycloid.		
4.	Orthographic Projections 4.1 Converting pictorial view into orthographic views (First angle method of Projection), 4.2 Sectional orthographic projection of simple objects	08	00
5.	Isometric Projections 5.1 Isometric projection of simple objects 5.2 Isometric projection of objects having circular holes	08	00

LIST OF PRACTICAL/EXPERIMENTS:

A3 size sketch book should be used by the students. It is necessary to draw all the sheet problems in sketch book first and then redrawn on the sheets

1. One sheet on types of lines, letters, numbers and scales.
2. One sheet on Engineering curves, (Minimum 4 curves).
3. One sheet on Orthographic Projection, (Minimum 2 objects) by first angle method
4. One sheet on Isometric projection of simple object (Minimum 2 objects).
5. One sheet on geometrical constructions which includes all additional drawings given in chapter 5

PRACTICAL EXAMINATION:

At the end of term practical examination of 50 marks of 2 Hours duration is compulsory to all students. External and Internal Examiners should set and assess the Question paper jointly as per following guidelines

a) Engineering curves (Solve any one out of two given) 10 marks
b) Geometrical construction & scales (Solve any one out of two given) 10 marks
c) Orthographic Projections (One Problem) 15 marks
d) Isometric projections (One Problem) 15 marks

TEXT BOOKS:

Sr. No	Title and Edition	Author	Publisher
1	Engineering Drawings	N. D. Bhatt	Charotar Publishing House
2	Engineering Drawings	Sidheshwar, Shastri	Tata Mc Graw Hill
3	Engineering Drawing	R.V.Mali	Vrinda Publication

COURSE CODE: 5G107 COURSE NAME: BASICS OF COMPUTER SYSTEMS

Teaching Scheme		Evaluation Scheme						
TH	1		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	--	--	50	50	--	100
TOTAL	3	Duration	--	--	--	--	--	--

RATIONALE:

With rapid development of Technology and competitive economy, computers play very important role in the diversified fields such as computer aided design of circuits, power generation, image processing, telecommunication modeling and simulation etc.The built in characteristics of computers have made them inevitable in different applications areas. So it is essential for a Diploma Technician to have a knowledge regarding computers and develop a skill to handle different software's available. It is always essential for a technician to update their knowledge to cope up with the fast development in software's. Considering this in view and duties to be performed by Diploma Technician in professional life, following curriculum is suggested.

COMPETENCY STATEMENTS:

- **To understand working & use of Computer for day-to-day use.**
- **To use computer for word processing, accounting related applications**
- **To prepare professional presentations.**
- **To understand and use Internet.**

COURSE OBJECTIVES:

Student should able to,

- Understand working of computers
- Get knowledge of various components of computers.
- Understand concept & functions of Operating System.
- Perform file management operations using My computer & Windows Explorer
- Print the letter using MS Word
- Perform worksheet operations using MS Excel
- To prepare professional presentations using MS PowerPoint
- Use Internet for Create E-mail id, receive & send E-mail with attachment
- Search for the information on Internet.

CONTENTS:

Topic No.	Content	Hours	Marks
1.	**Fundamentals** 1.1 Types of computer, Block Diagram showing components of computer, 1.2 Input devices, output devices, CPU, 1.3 Primary Memory, Secondary memory.,(usage of memory) 1.4 processor and its speed, RAM, Monitor, Display card, 1.5 Hard Disk, Floppy drives, CD drive, Sound card, etc. (Use of each) 1.6 Hard ware and software, 1.7 Types of software. Concept of Operating System: Definition, functions and examples of operating system (like DOS, WINDOWS, Linux).	02	00

2.	**Windows** 2.1 Bios, Power on self-test.. 2.2 Concept of file & directory, rules for file & directory names. 2.3 WINDOW 98/2000/XP 2.4 introduction Starting Windows, Desktop, Icons, Task bar, Short cuts, The start Button, Arranging windows, Shutting down windows . 2.5 Windows Explorer: Creating, renaming, deleting Folders/ file. Copying, moving, deleting, renaming files, Using Send to, Search files and folders, Recycle bin 2.6 Windows Setting: Date format, adding printer. 2.7 Windows Accessories: Calculator, Notepad, paint, word pad.	03	00
3.	**Ms-Word** 3.1 Introduction to word processing, Introduction to MS word. Opening, Saving, closing a file. 3.2 Page setup: Changing Margins, layout, and paper size. Formatting Text: 3.3 Tables: Insert table, enter and edit data into table. 3.4 Printing: Print preview, selecting printer, and print options.	03	00
4.	**Ms-Excel** 4.1 Introduction to electronic spreadsheet. Introduction to MS Excel. 4.2 Components of MS Excel window like Title bar, Menu bar, Formula Bar, Status bar, 4.3 Worksheet area, Sheet Tabs, Columns, rows. Hiding and viewing Toolbars like standard and formatting tool bars. Entering data, copying, moving, Editing cell entries use of auto fill Saving, closing and opening file. 4.4 Page setup: Changing Margins, layout, and paper size. Enter formula, copy formula using fill handle Inserting functions. 4.5 Use of functions like SUM, AVERAGE, MIN, IF, COUNT, LOG, SIN, COS, ROUND, SQRT, PI etc. 4.6 Formatting data: Change number format, alignment, borders, font, size etc. Use auto Format, 4.7 Restructuring worksheet: Inserting and deleting the columns and rows. Changing column width, row height. 4.8 Charts (Graphs): Types of charts, creating and modifying charts, printing charts.	04	00
5.	**PowerPoint** 5.1 Overview, Using design template and auto content wizard, 5.2 Creating presentation, slides and its types, slide	02	00

	operations, modifying & running presentation, adding & editing objects, creating tables, charts & Diagram, save & print option ,custom presentation, applying transition & animation effects.		
6	**Internet:** 6.1 Introduction: Uses of internet, 6.2 Resources required using Internet. Internet Service Provider: Need & Duties of ISP, 6.3 Connecting to Internet, Domain &addresses, Internet Browsers, Search engines , Email, Chat.	02	00

LIST OF PRACTICALS
(If required specify minimum number of practicals to be conducted from the following)

1. List and identify the peripheral devices of a PC. Connect the keyboard, mouse, printer, monitor, and scanner to a computer. Get the information about the manufacturers and prices of various components of a PC.

2. **Windows**
   Start and shutdown of windows. Starting different applications. Using applications like calculator, paint, word.
   Observe various features of windows like menus, push buttons, drop down list, check boxes, option buttons etc.
   Perform file management operations such copying, deleting, renaming, creating folders, renaming folders using My computer , Windows Explorer, searching files and folders.
   Change windows format such as wall paper, date & time format, Installing printer, installing & removing programs by using add /remove programs, change display properties.

3. **Microsoft Word**
   - Prepare a sample bio data
   - Write an application for job
   - Prepare a time table in tabular format.

4. **Microsoft Excel**
   Create a sample result sheet of your class.
   Create salary sheet for Employees (Apply Excel formulae/ functions to solve problems.)

5. **Internet**
   - Creation of email account
   - Send E-mail, Receive E-Mail. (use attachment)
   - Management of email account.
   - Searching information on internet

6. **PowerPoint**
   - Creating PowerPoint presentation, Running presentation.
   - Applying design template, background, transition effects, animation slide.
   - Preparing custom presentations and using pack and go features.

REFERENCES:

Sr. No	Title of Book	Author and Publication
1	Fundamentals of Computers	P.K.Sihna BPB Publication
2	Teach Yourself Windows 98	Greg Perry Techmedia
3	Teach Yourself Windows 98	Cassel & Hart Techmedia
4	Windows 98 Bible	Alen Simpson BPB Publication
5	MS Office 2000	Ed Bott Woody Ceonhard (PHI)
6	Microsoft Office	Ron Mansfield BPB Publication
7	Teach Yourself MS Office 97	Greg Perry Techmedia

Course Code: 5T201
Course Name: COMPUTER PROGRAMMING (CP)

Teaching Scheme		Evaluation Scheme						
TH	4		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25	-	150
TOTAL	6	Duration	1 Hr	3 Hr.	-	2 Hr.	-	-

RATIONALE:
To develop programming skills in the students using a popular structured programming language "C". The students will learn the step-by-step procedure (i.e.) Algorithm and flowcharting for program development.

COMPETENCY STATEMENTS:
1. To draw Flowchart and write algorithm for simple problems.
2. Develop simple 'C" programs and execute them on machine.

OBJECTIVE
Students will be able to:-
1. Develop the ability of programming in HLL
2. Understand and use standard structures in programming
3. Prepare algorithms and flowcharts
4. Coding, testing and debugging a program
5. Understand the concepts of functions

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Introduction to 'C' Programming.** 1.1Introduction 1.2History and features of C 1.3Algorithms and Flowcharts 1.4Structure of C Programming 1.5Character set of C 1.6Data Types 1.7Identifiers, variables, constants, key words 1.8Format specifiers and Escape Sequences. 1.9Operations and Expression: Arithmetic, Relational, logical, assignment, conditional operators.	10	14
2	**Input and Output statements.** 2.1'C' programmed structure 2.2Data Input and output Functions:printf, scanf, getchar, putchar, getch, putch 2.3Library functions 2.4Maths functions.	08	10
3	**Control and Loop Statements.** 3.1Unconditional branching: goto statement. 3.2Conditional branching statements: If statement, if- else, Nested 'if'. 3.3switch case statement.	12	14

	3.4Loop statements: 'for' statement, 'while' statement, 'do-while' statement 3.5break and continue statement.		
4	**Arrays.** 4.1Arrays:array definition and declaration 4.2Concept of one dimensional, two dimensional and multi dimensional array 4.3Array initialization operations on one and two dimensional arrays. 4.4Characteristics of arrays.	10	12
5	**String** 5.1Introduction 5.2Declaration of String 5.3Reading string and writing string 5.4String input and output functions: gets, puts 5.5String handling functions: concatenation, comparison, length of a string.	06	08
6	**Storages classes** 6.1Introduction 6.2Types of storage classes 6.2.1Automatic storage class 6.2.2Register storage classes 6.2.3Static storage classes 6.2.4Extern storage classes 6.3Local and global variables.	06	08
7	**Functions.** 7.1Introduction 7.2Defination of function 7.3Concepts of library functions 7.4User-define functions 7.5Call by value method 7.6Function types: parameter passing mechanisms 7.7Passing array to function 7.8Recursion.	12	14

LIST OF EXPERIMENTS:

Practicals should be performed on Linux Platform.

Any 12 (Twelve) laboratory experiments and/or assignments from following list:

1. Assignment to prepare general algorithms and flowchart.
2. Assignment to write character, operator's symbols of c language, to identify valid and invalid variables, constants and expressions.
3. Assignment to convert arithmetic expression to expression in 'c' language.
4. Program based on Input/Output statements.
5. Program based on Arithmetic expression.
6. Program based on library functions.
7. A program based on goto statement.

8. A program based on "if" and "nested if".
9. Program based on 'switch case' statement.
10. Programs based on, 'for', 'while', 'do-while', break continue statement.
11. Programs based on array (e.g. – matrix addition, matrix multiplications).
12. Programs based on string operations.
13. Programs based on functions.
14. Programs based on Recursion.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows:-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher & Edition
01	3rdedition Yashwant Kanetkar	Let us C	BPB publication
02	Balguruswami 2nd edition	Programming in 'C'	Tata MG-GrawHill
03	Mullish Cooper –2000	The Spirit of C	Jaico publication
04	2nd edition- Schavis	Programming with 'C'	Tata Mc-GrawHill

COURSE CODE: 5T202 COURSE Name: ADVANCED C PROGRAMMING (ACP)

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	25	--	150
TOTAL	05	Duration	**1 Hour**	**3 Hours**		**2 Hours**		

RATIONALE:

To develop C programming skills in the students using pointer, structure, graphics. The students will learn to handle files & create small moving objects using c graphics header file.

COMPENTANCY STATEMENT(S):

1. To create structure of different data types in one head.
2. To open file using c program.
3. To draw different shapes of graphics in C.

COURSE OBJECTIVES:

Students will be able to:-

6. Develop the ability of programming in HLL
7. Understand and use standard structures in programming
8. Understand pointer to store data in memory location.
9. Understand the use of structure.
10. Develop the ability of making animation in C.

CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1.	**Pointer:** 1.1 Declaration & initialization of pointer 1.2 General structure of pointer 1.3 Pointer & array: pointer of array variable, accessing array using pointer, array of pointer 1.4 Character array & pointer: declaration, initialization & accessing of character pointer, passing character pointer to function. 1.5 Call by reference (passing pointer to function). Pointer to pointer	**10**	**16**
2.	**Structure & Union** 2.1 Definition & declaration of structure 2.2 memory allocation of structure 2.3 access structure: using structure variable declared in main &	**14**	**24**

	outside main function 2.4 Array of structure 2.5 Structure within structure 2.6 Pointer in structure, passing structure to function 2.7 Union: definition, declaration, Use of union, accessing union, union within structure.		
3.	**File handling** 3.1 File, Concept of file pointer 3.2 File operations reading, writing & appending a file. 3.3 File modes 3.4 File handling function such as getc(), putc(), getw(), putw(), fscanf(), fprintf(), fseek(), ftell(). 3.5 Examples on reading existing file & new file, writing data on existing file and new open file.	**12**	**20**
4	**Graphics function** 4.1 Introduction to graphics.h header file 4.2 init graph method, graphics mode and driver 4.3 Work of init graph function 4.4 draw shapes using graphics function such as Arc, circle, line, moving shapes by pixels.	**12**	**20**

LIST OF EXPERIMENTS:

Practical performs on Linux operating system.

Any 12 (Twelve) laboratory experiments and/or assignments from following list :

1. Programs based on initialization of pointers.
2. Programs based on pointer of array.
3. Programs based on array of pointer.
4. Programs based on character pointer.
5. Programs based on call by reference.
6. Programs based on simple structures
7. Programs based on nested structure,
8. Programs based on array of structure
9. Programs based on passing and returning structures to functions.
10. Programs based on creating union and accessing it.
11. Programs based on Reading/opening sequential files
12. Programs based on writing and appending sequential files.

13. Implement program for file handling functions such as getc(), putc(), getw(), putw()
14. Implement program for file handling functions such as fscanf(), fprintf(), fseek(), ftell().
15. Programs based on graphics initgraph method.
16. Programs based on graphics to draw arc
17. Programs based on graphics to draw circle.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher & Edition
01	3rdedition Yashwant Kanetkar	Let us C	BPB publication
02	Balguruswami 2nd edition	Programming in 'C'	Tata MG-GrawHill
03	Mullish Cooper –2000	The Spirit of C	Jaico publication
04	2nd edition- Schavis	Programming with 'C'	Tata Mc-GrawHill

]

CT DC HOD CDIC

COURSE CODE: 5S203 COURSE NAME: Electrical Technology (ETG)

Teaching scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max. Marks	20	80	25	25	--	150
Total credits	05	Duration (Hrs.)	01	03	--	--	--	--

RATIONALE:

Electricity is the basis for operation of any computer, electronic and communication equipments. Hence it is essential for students of diploma program in information technology to study the basic electrical engineering. Thus, a separate paper is included in the syllabus of diploma program in information technology. Basic electrical engineering is essential to learn basic concepts in electrical engineering such as voltage, current, resistance, Electric and Magnetic circuits, AC fundamentals, Single phase and three phase circuits, Single-phase transformer and DC machines.

COMPETENCY STATEMENT:

1. Select, connect and operate Electrical-measuring instruments/equipments.
2. Develop ability for solving numerical problems
3. Explain the fundamentals and laws electrical engineering
4. Differentiate the electric and magnetic circuits.
5. Understand the construction and operation of electrical machines and transformer.

COURSE OBJECTIVES:

Student should able to,

1. Understand basic concept of electrical engineering.
2. Get knowledge of various terminologies used in electrical engg.
3. Understand concept of circuit diagram & can draw and read various circuit diagrams
4. Perform simple SC and OC test on transformer.

CONTENTS

Chapter	Name of Topic	Hrs	Marks
01	**Fundamentals** 1.1 Structure of atom ,concept of current , emf, pd 1.2 Resistance & its properties 1.3 Laws of resistances & resistivity 1.4 Factors affecting the resistance, Effect of temperature on resistance, RTC 1.5 Ohm's law 1.6 Series & parallel combination of resistances, Division of currents in parallel branches, simple numericals 1.7 Kirchhoff's current and voltage law 1.8 Simple numerical based on ohm's law & Kirchoff's laws	08	12
02	**Magnetism & Electromagnetism** 2.1 Concept of magnetic lines of forces, magnetic field. 2.2 Flux, flux density, magnetic field intensity, MMF, reluctance, permeability. 2.3 Magnetic hysteresis, hysteresis loop, hysteresis loss. 2.4 Eddy currents & Eddy current loss.	08	12

	2.5 Methods to minimize hysteresis & Eddy current loss. 2.6 Electric and magnetic circuit similarities & dissimilarities 2.7 Faraday's laws of electromagnetic induction 2.8 Lenz's law		
03	**Single phase A.C. Circuits** 3.1 Generation of alternating voltage ,wave forms & phasor representation. 3.2 RMS & average values 3.3 Phase & phase difference 3.4 series R-L, R-C, R-L-C circuits, voltage, impedance, power triangle. 3.5 Simple numerical based on above topic.	08	12
04	**Three phase A.C. Circuits** 4.1 Advantages of three phase over single phase, Phase Sequence. 4.2 Star & Delta connections	04	06
05	**Single phaseTransformer** 5.1 Construction & classification of single phase transformer based on construction & voltages. 5.2 Working principle, e.m.f. equation, transformation ratio. 5.4 Simple numerical based on above topic.	04	06
06	**D.C. Machines** 6.1 Construction & classification 6.2 Working principle of d.c. generator & motor 6.3 characteristics of d.c. motor	06	12
07	**A.C. Machines** 7.1 Construction of three phase induction motor 7.2 Classification 7.3 Speed & Slip 7.4 Construction , Working principle , uses of single phase induction motor 7.5 Universal motor construction, working principle, uses. 7.6 Stepper motor construction, working principle, uses.	10	20

Practical (All compulsory)

1) Construct a simple circuit using rheostat, ammeter, voltmeter, wattmeter & verify ohms law.
2) Use a rheostat as a regulator and potential divider in the circuit.
3) Verification of Kirchhoff's laws.
4) To plot B-H curve of a field winding of a d.c. machine
5) To calculate p.f. of a R.-L series circuit, and draw phasor diagrams.
6) To calculate p.f. of a R.-L –C series circuit, and draw phasor diagrams.
7) To verify the relation between line and phase values of a star connection
8) To verify the relation between line and phase values of a delta connection
9) To find transformation ratio of a single phase transformer
10) To plot $N-I_a$ characteristics of d.c shund motor
11) To reverse direction of rotation of a three phase induction motor

Reference Books:

1. Electrical Technology – B.L. Thereja Vol.-1
2. Electrical Technology – M.K .Chondekar.
3. Electrical Technology – S.L.Uppal

CT DC HOD CDIC

Course Code: 5S204 Course Name: BASIC ELECTRONICS DEVICES & CIRCUIT

Teaching Scheme		Evaluation Scheme						
TH	02		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	10	40	25	25	--	100
TOTAL	04	Duration	1 H	2H				

RATIONALE:

This course forms foundation for all courses in Electronics. It prepares students to understand construction, operation, characteristics and applications of electronics devices.

COMPETENCY STATEMENT:

To understand basic analog circuit arrangement using various components & devices.
To construct and test analog circuits consisting of discrete components

OBJECTIVES:

Students should understand basics of different Electronic Devices, Rectifiers and Amplifiers.

CONTENTS:

Sr.No.	Name of the Chapter	Hours	Marks
1.	**Types of materials** 1.1 Conducting materials: Resistivity, factors affecting resistivity, classifications of conducting materials. 1.2 Insulating materials: Selection of Insulating materials, general electrical properties like, Permittivity, dielectric strength, dielectric loss angle. 1.3 Semiconductor materials: Intrinsic semiconductor, extrinsic semiconductor, P-type, N-type semiconductor. 1.4 Magnetic materials: Classification, properties, soft & hard magnetic materials.	**05**	**10**
2.	**Semiconductor diode** 2.1 PN junction, formation of depletion layer in pn junction, barrier voltage. 2.2 biasing the pn junction, forward bias, reverse bias, reverse saturation current,VI characteristics, diode current equation 2.3 Power and current rating of diode. 2.4 Zener diode: Forward/ reverse characteristics, specifications. Equivalent circuit.Zener diode as regulator 2.5Rectifiers & Filters: Block Diagram of Power Supply, Half wave, Full wave, Bridge rectifier, 2.6 Derivation of average value of O/P voltage & load current in HWR, FWR and bridge rectifier. 2.7 Ripple factor, PIV, efficiency, TUF, comparison of rectifiers.	**10**	**14**

	2.8 Filter: concept of filters, types, inductor filter, capacitor filter, bleeder resistance, simple numerical examples based on above		
3.	**Introduction to Transistors** 3.1.Introduction to Transistor construction, transistor terminals identification & symbol, unbiased transistor. 3.2. Transistor biasing, operation of NPN/PNP transistor. 3.3. CE, CB, CC configuration, relation between alpha & beta, leakage current in CE/CB configuration. 3.4. Transistor I/O characteristics in CE, CB configuration. 3.5. Introduction, DC operating point, Load line, Q point, Maximum undistorted output. 3.6. Factor affecting stability of Q point, Stability factors , Stability factor of CB, CE Circuit. 3.7Methods of transistor biasing, Base bias, Base bias with emitter feedback, Base bias with collector feedback, voltage divider bias and stability factor in each, Simple numerical based on above topic.	**12**	**18**
4	**Field Effect Transistor** 4.1 Introduction to JFET, Formation of depletion layer in JFET, operation of JFET. 4.2.Characteristics, effect of gate to source voltage on drain characteristics, transfer characteristics, JFET parameters. 4.3 Comparison of JFET & BJT. 4.4.MOSFET: working of depletion type, enhancement type MOSFET.	**05**	**08**

LIST OF PRACTICALS (ANY TEN)

1. To plot VI characteristics of Silicon & Germanium diode.
2. To plot characteristics of Zener diode.
3. To study zener diode regulator & plot load /line regulation characteristics.
4. Study of Half wave, Full wave rectifier
5. Study of Bridge rectifier
6. To study Capacitor, LC, π Filter and calculation of ripple factor.
7. To plot the characteristics of transistor in CE configuration.
8. To plot the characteristics of transistor in CB configuration.
9. To plot the characteristics of JFET.
10. To understand the concept of Transistor biasing & stabilization uses voltage divider bias.

TERMWORK:

Student should submit term work in the form of journal containing experiments and /or assignments conducted during the course from the List of Experiments.

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion &Correction of journal, Level ofParticipation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCES:

Sr. No.	Title of Book	Author and Publication
1	Electronic Components & Materials	Grover & Jamwal (Dhanpatrai & sons)
2	Applied electronics	R S Sedha (S Chand & Company)
3	Electronics devices & Circuit theory	Robert L Boylestad
4	Electronics Devices & Circuits	David Bell (Prentice Hall)

Course Code: 5S205 **Course Name: Digital Electronics (DE)**

Teaching Scheme		Evaluation Scheme						
TH	3		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	--	25	150
TOTAL	5	Duration	1	3	--	--	--	--

RATIONALE:

This course forms the foundation of digital systems which covers enormous range of applications in advance electronic, automation, automotive, communication & computer industries. This course will enable students to acquire the knowledge of all basic circuits and systems in the field of digital electronics & use the concept to study & develop various digital circuits.

COMPETENCY STATEMENT:

To construct and test circuits comprising of digital ICs.

OBJECTIVES:

This course deals with the basics of digital electronics such as number systems, logic gates, k-map and introduction to combinational & sequential logic design & study concept of memories.

CONTENTS:

Sr.No.	Name of the Chapter	Hours	Marks
1.	Number Systems & Binary Codes 1.1 Introduction to digital Systems 1.2 Number Systems: Binary, Decimal, octal & Hexadecimal, conversion of one number system to other. 1.3 Binary addition, subtraction, multiplication & division. 1.4 Use of 1's & 2's complements in binary arithmetic 1.5 Binary codes: BCD numbers, weighted & non-weighted binary codes, 8421 BCD code, BCD addition & subtraction 1.6 Excess-3 code & Gray code 1.7 Alphanumeric code, ASCII, EBCDIC	09	12
2.	Logic gates & Boolean algebra 2.1 Basic logic gates: NOT, AND, OR gate using semiconductor diodes, symbols, truth tables, logic equations. 2.2 Fundamental concepts of Boolean algebra: Basic laws, cumulative, AND, OR, complementation, associative, distributive laws, Demorgan's theorems. 2.3 Universal logic gates: NOR & NAND gates using diodes, symbols, truth tables, basic logic gates using universal gates, EXOR & EXNOR gates. 2.4 Standard form of Boolean function-SOP & POS & its application, K-map reduction method for 2,3 & 4 variables, minimization of logic function specified in min term / max term & truth table, don't care conditions 2.5 Design examples : BCD to 7 segment decoder, binary to gray code converter, gray to binary code converter, BCD to excess-3 code converter, excess-3 to BCD code converter.	**17**	**28**

3.	Arithmetic Logic Unit 3.1 Types of Digital Systems (Combinational & Sequential) & their block diagram, Operating Principles 3.2 Adders: Half & Full adder's n bit parallel binary adder. 3.3 Subtractor: Half & full subtractor 3.4 Design 4 bit binary adder/subtractor using IC 7483, Single digit BCD adder sing IC 7483	**06**	**12**
4.	Multiplexer & Demultiplexer 4.1 Necessity of MUX, Principle of multiplexing & their types-2 to 1, 4 to 1, 8 to 1, & 16 to 1 lines, Block diagrams 4.2 Multiplexer tree 4.3 Necessity of DEMUX, Principle of Demultiplexing & their types-1 to 2, 1 to 4, 1 to 8 & 1 to 16 lines, Block diagram 4.4 Demultiplexer tree.	**06**	**10**
5.	Flip Flop 5.1 Triggering methods: edge & level, 5.2 1 bit memory cell, Clocked S-R flip flop with Preset & clear, 5.3 J-K flip flop, The Race around condition, Master-Slave J-K Flip-flop, 5.4 D type Flip-flop, T type Flip-flop, Truth Tables & Applications of all above Flip-flops.	**10**	**18**

LIST OF PRACTICALS (ANY TEN)

1. Study of logic gates, verification by truth-tables.
2. Implementation of Boolean expression using AND/OR/NOT logic and NAND gates.
3. Realization of basic gates using universal gates.
3. Realization of Half and Full adder using gates.
5. Realization of half and full subtractor using gates.
6. Binary adder IC 7483
7. Design and realization of binary to Gray Code converter.
8. Design and realization of gray code to binary Code converter.
9. Design and realization of binary to Excess 3 Code converter.
10. Study of Demultiplexer.
11. Study of Multiplexer.
12. Study of SR-FF, JK-FF, T-FF and D-FF
13. Study of Master-Slave JK Flip-flop.
14. BCD adder using Binary adder.
15. Study of B.C.D. to 7 Segment decoder.

TERMWORK:

Student should submit term work in the form of journal containing experiments and /or assignments conducted during the course from the List of Experiments.

Grade / Marks will be given by respective subject teacher & will be evaluated as follows

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion &Correction of journal, Level ofParticipation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience

REFERENCES:

Sr. No	Title of Book	Author and Publication
1	Modern Digital Electronics	R.P.Jain (TMH)
2	Digital Electronics & Principle	Malvino Leach (TMH)
3	Digital Integrated Electronics	H.Taub and D.Schilling

Course Code: 5S206 COURSE NAME: COMPUTER WORKSHOP

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	-	2				2
	Prog. Test	End Exam.				
Marks	-	-	--	50	25	75
Duration	-	-				

COMPETANCY STATEMENT(S):

1. To understand working & use of Computer for day-to-day use.
2. To understand basic components of computers
3. To connect peripheral devices
4. To maintain the computer systems

RATIONALE:

This subject is essential for creating awareness of computers for the students. It gives handling experience of computers to the students. It introduces basic components of computers and connecting them to the system. Since the dirt can affect reliability and Performance of various components, cleaning of components become one of the essential activity of basic maintenance. This subject demonstrates steps in cleaning and handling various components, handling problems with component connections. This subject gives the basic knowledge required for Pc architecture and maintenance.

COURSE OBJECTIVES:

After studying this subject, the student will be able to --

1. Understand basic components of computers
2. Connect peripheral devices
3. Clean various devices like Keyboard, mouse, printers, motherboard
4. Park and eject the papers over the printer
5. Write Data on the CD
6. Scan documents and images
7. Understand front panel and back panel connections.
8. Connection of Pen drives and DVD
9. Define preventive maintenance
10. Identify importance of PC preventive maintenance
11. Identify types of PC preventive maintenance products
12. Identify types of PC preventive maintenance procedures
13. Identify maintenance activities that can be mechanized
14. Identify the need for creating preventive maintenance schedule
15. Create preventive maintenance schedule
16. Learn when and how to implement these safety measures

CONTENTS

Topic No.	Content	Hours	Marks
1.	**Introduction to Various External Peripheral Devices** 1.8 Types of Computers, PDAs, 1.9 Types of PC Cases, Safety and Care and ESD, 1.10 Parts of a PC, System Board Overview, Expansion Bus, 1.11 Storage Devices, 1.12 SCSI, 1.13 CD-ROMs Tape 1.14 Backup Devices, Floppy Drives. 1.15 Different types of keyboards, 1.16 Different types of Mouse, 1.17 Different types of Scanners, 1.18 Different types of Modems, 1.19 Different types of printers, 1.20 speakers, 1.21 CD read /write drive , 1.22 Microphones, 1.23 LCD projectors, 1.24 Pen drives, 1.25 DVD drive, 1.26 Different types of Monitors.	00	00
2.	**Introduction to Various Internal Devices** 2.1 Different makes of hard disks 2.2 Different types of network Interface cards 2.3 Different types of cables such as data cables, 2.4 printer cables, network cables, 2.5 power cables etc. 2.6 Different types of floppy disk, 2.7 Motherboard connection, Graphics Card connection, Network Interface card connection	00	00
3.	**Physical Connections of different peripheral Device** 3.1 Connection of Mouse to different ports, 3.2 Connection of keyboards to different ports, 3.3 Connection of Monitors, 3.4 Connection of Printers, Different switch settings of printers, Printer's self test, 3.5 Jumper settings of hard disks, 3.6 Attaching FDD, HDD and CD drives, Attaching Pen Drives and DVDs, Attaching Scanners.	00	00
4.	**Introduction to the System Architecture** a. System Architecture Overview, b. Components of a Motherboard, The CPU, Characteristics of a CPU, CPU Sockets, BIOS & CMOS, c. types of Memory, Memory Packages, RAM's d. integral Part of the Computer System, IRQs, DMA Channels, Common I/O Addresses, COM Port	00	00

	Addresses, Cable Connections, e. Serial vs. Parallel, Computer Port Identification, f. A Brief History The ATX, g. Form Factor Expansion, Bus Architecture Slots and Sockets PC Card (PCMCIA)		
5.	**OS Basics** 5.1 MS-DOS Structure, 5.2 MS-DOS Commands, 5.3 Windows 9x Structure, 5.4 Windows XP Structure, 5.5 File Systems, 5.6 Boot Environment Drivers, Applications and Printers	00	00
6	**PC Preventive Maintenance Issues** 6.1 Introduction, Importance of Preventive Maintenance, 6.2 Preventive Maintenance Products, 6.3 Preventive Maintenance Procedures, 6.4 Implementing preventive measures on PC Components: Keyboard, mouse, Drives, Floppy drive, CD ROM drive, Hard Disk drive, Monitor, & Printer.	00	00

TEACHING METHODOLOGY:

1. Lecture method without media.
2. Lecture method-using media.

3 Demonstration using LCD projector.

TEACHING RESOURCES:

5. Overhead projector
6. LCD projector

PRACTICAL ASSIGNMENTS:

1. Observe all the peripheral devices available in the lab. Describe them in detail.
2. Demonstration of system configuration using CMOS setup.
3. Study of different ports such as serial, parallel, PS/2, NIC ports.
4. Assignment on how to write data on CDs
5. Observe different printer settings on different types of printers available in your lab. Write down the function of each switch.
6. Demonstration of printer's self test.
7. Assignment on connection of speakers and microphones.
8. Assignment on different types of cables in your lab.
9. Assignment on cleaning procedures of Mouse, Keyboard and motherboard.
10. Assignment on how to connect scanner and scan document and pictures on the scanner available in your lab.
11. Assignment on making jumper settings on hard disk.
12. Assignment on different types of cards such as graphics card, LAN card, multimedia cards etc.

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	Mr. David Stone & Alfred Poor	Troubleshooting Your PC	Prentice Hall India
02	David Groth	A+ Complete	BPB Publication
03	Balasubramaniam	Computer Installation and servicing	Tata McGraw Hill
04	Manuals	Reference Manuals of PC Troubleshooting and maintenance	--

COURSE CODE: 5S207 COURSE NAME: SOFTWARE DEVELOPMENT TOOL

Teaching Scheme		Evaluation Scheme						
TH	01		PT	TEE	TW	PR	OR	Total
PR	03	Max.Marks	-	--	50	--	50	100
TOTAL	04	Duration	-	--	--	--	--	--

RATIONALE:

In the present era of Information technology, VB.NET is a powerful tool used for developing user friendly and platform independent applications that run under Windows using its dot net Framework. This will concurrently generate related basic competencies required for designing and developing future practical and lifetime major projects.

COMPETENCY STATEMENT:

1. To understand essential components (visual tools) of Visual softwares.
2. To develop the skill of visual basic programming to build custom standalone applications.
3. To understand design principles of forms, common dialog, menus and graphics.
4. To use ADO.NET for database connectivity with different databases such as Access2000, Oracle9, SQL Server.

OBJECTIVE:

1. After completing this course, student will be able to
2. Understand working in visual environment
3. Develop User Friendly applications in VB.NET.
4. Develop Database Applications using VB.NET.

COURSE CONTENTS:-

Sr. No	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**INTRODUCTION TO VISUAL ENVIRONMENT** 1.1 Concepts of visual programming 1.2 object, features Environment of VB – Menu bar, toolbar, project explorer, toolbox, properties window, form designer, form layout, immediate window . 1.3 Concept of project, elements of projects, form etc.	03	--
2	**CONTROLS AND EVENTS** 2.1 Data types, variables, constants, Arguments, function return values, 2.2 Control flow statements, 2.3 Loop statements 2.4 Nested control structures, The exit statement, 2.5 String functions, 2.6 Special functions available in VB like Input Box ( ), Message Box ( ), Format ( ). 2.7 Text box, list Box, Combo Box , Scroll Bar and slider Control. , 2.8 Container – picture box, frame, Option button, checkbox, command button, images. ,OLE controls ,	4	--

	2.9 File controls. Designing a form using controls, 2.10 Concepts of event & properties, 2.11 Changing properties (runtime & design time) Important events of each control 2.12 Creating applications using controls, Timer.		
3	**OVERVIEW OF MICROSOFT .NET PLATFORM** 3.1 What is Microsoft .NET platform? 3.2 .NET framework and the Common Language Runtime, 3.3 Building blocks of VB.NET, 3.4 Components of .NET Framework, 3.5 Types of application architecture, 3.6 Differences between VB and VB.NET.	02	--
4	**WINDOWS FORMS** 4.1 All about windows forms, 4.2 Creating windows applications, 4.3 Adding controls to forms, using the MsgBox Function, Using the MessageBox.Show Method, Using the Input Box Function, 4.4 Working with Multiple Forms, Creating Multiple Document Interface (MDI) Applications, and Creating Dialog Boxes. Text Boxes, Rich Text Boxes, Labels, Creating Multiline, Word-wrap Text Boxes, 4.5 Accessing text in Text Box, 4.6 Adding scroll bars to text boxes, Labels, Aligning text in Labels, Creating a Link Label, 4.7 Linking to Another Form, Setting Buttons Caption, Foreground & Background Color, 4.8 Handling Buttons Click Event, Using the checkbox class, creating checkboxes, Using Radio Button Class, 4.9 Using the List Box Class, Adding items to list box, Removing items from list box, 4.10 Creating simple combo box, Adding items to a combo box, 4.11 Using the picture Box Class, Setting or Getting the Image in picture box	03	--
5	**VALIDATION CONTROLS, CALENDARS, AND AD ROTATORS** 5.1 Validation Controls, 5.2 Required Field Validator, 5.3Comparison Validator, 5.4 Range Validators, 5.5 Regular Expression Validator, 5.6 Custom Validator, 5.7 Creating Calendars, Creating Ad Rotator.	02	--
6	**DATABASE PROGRAMMING WITH ADO.NET** 6.1 Introduction to ADO.NET: What is database? 6.2 ADO.NET Data Architecture, 6.3 How to create a table in SQL? Data Provider, SQL Data Provider, SQL Data Reader, 6.4 Binding data to Controls using Database wizard, Accessing and Manipulating Data: 1) Selecting Data 2) Inserting Data 3) Deleting Data 4) Updating Data. 6.5 Working with Multithreading, Synchronizing Threads.	02	

CT DC HOD CDIC

LIST OF EXPERIMENTS: (minimum 15 experiments)

1. Design forms to perform mathematical operations like addition, subtraction, multiplication and division using Text box, labels, Options to be selected using option, check box and combo box.
2. Design forms to use Date, Time, and String, Mathematics functions with help of text box, label, Radio button, check box, and combo box and command button.
3. Using image control and scroll bar, design form to change height, width of image, movement to image. Using picture box and image list, flip the image on click of command button.
4. Design explorer using Directory, drive, file list box and common dialog controls.
5. Introduction to VB.NET.
6. Console Application(Use ReadLine ( ) & Write Line( )):
   I. WAP to display your Name, City, Age without using variables.
   II. WAP to enter your Enroll No, Name, City, Percentage, Birth Date & store it in the variables & display all information.
7. Console Application(Use Control Structure)
   I. WAP to check entered number is odd or even.
   II. WAP to find largest & smallest number among three numbers.
   III. WAP to enter information of student Seat No, Name, Marks in five subjects, Calculate total marks, percentage obtained and find out grade depending upon percentage using IF«ELSE and SELECT«CASE and display it
8. Write a program by using Windows Applications (Use VB.NET)
   I. WAP to display WELCOME TO GPA when clicked on a welcome button.
   II. WAP to accept your name IN Input Box & display it on Message Box.
   III. WAP to accept your Name, City in Text Box & display it in Label when you click on Display Button. Add two more buttons Clear & Close.
9. Application to check User Name & Password.
10. A program to demonstrate the design of simple calculator. It should work very similar to calculator application of windows with functions such as add, sub, mul, div, inverse, negation, square, square root.
11. Introduction to COM components.
12. Windows Application (Combo Box, Radio Button)
    I. Application to Add & Remove City from Combo box
    II. Application to display selected course use of Radio Button
13. Design a form to display a picture using image box and picture box. Set appropriate properties. Show interface to display pictures selected from files listed in list box, text box.
14. Design and demonstrate the concept of MDI form and child form. Also demonstrate to arrange these forms with cascade, tile horizontal, and tile vertical.
15. To create a registration form using validation for blank values, email address, telephone or mobile numbers.
16. Designing Database Application using ADO.NET.
17. Integrate all above practical to form mini project including login form.

TERMWORK:

Student should submit a term work in the form of journal containing above assignments conducted during the course from the List of Experiments. Also a mini project is to be developed by the group of 2/3 students.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable). In practical hours teacher should clear all the theoretical and practical features of student of respective practical. Lecturer should demonstrate the idea by taking example and demonstrate the key concepts in each practical assignment.

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:

The oral examination will be based on the above mentioned assignments & mini project developed by group of 2/3 students. Questions will be asked during the oral examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

TEXT BOOKS

S.No.	Name of Book	Author	Publication
01	Mastering VB6	Evangelos Petront Sos	BPB publications
02	The Complete ReferenceVB6	Nel Jerka	Tata McGraw Hill publishing
03	MSDN library online reference		From Microsoft MSDN library
04	Beginning VB.NET.	Crossland	
05	Visual Basic .NET Programming Black Book	Steven Holzner	Dreamtech Press
06	Mastering VB.NET.	David F.Rogers.	
07	Professional VB.NET	Barewell, Forgey, Hollis.	
08	Mastering VB6	Evangelos Petront Sos	BPB publications
09	The Complete ReferenceVB6	Nel Jerka	Tata McGraw Hill publishing

COURSE CODE: 5S208

COURSE NAME: WEB PAGE DESIGNING LAB(WPDL)

Teaching Scheme		Evaluation Scheme						
TH	--		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	--	--	25	25	--	50
TOTAL	2	Duration	--	--	2	2		

RATIONALE:

It is estimated that across the Internet, over 100 million domain names are in use. which fast and cheap broadband Internet connections available to the masses, online users now exceeding 500 millions. Tens of millions of users are now creating personal Web sites. It is a practical oriented subject which will enable student to develop Web sites.

COMPETENCY STATEMENT (S) :

1. To understand working & use of web pages.
2. To use computer for HTML, Front Page related application
3. To prepare professional presentations

COURSE OBJECTIVES: Students will be able to

1. Design simple web pages –using HTML
2. Organize information using Tables , collect information from users using forms and present information using frames.
3. Use style sheets to gain full control of formatting within Web page.

CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1.	**Introduction To Html** 1.1 Components of HTML: Tags, Elements, Attributes, Closed and open tags. Structure tags. 1.2 Standard HTML, tags: HTML, Header, Title and body. Block level tags: Block Formatting, Heading, Paragraph, Comments, Breaks, Center, Text Alignment and font size, 1.3 Text Level Tag. Bold, Italic, Moonscape, Underlined, strike-through, superscript, subscript, Horizontal Rules. 1.4 Colors in Web page.: Background color, Text color, Link color. Special characters.: Lists. Ordered lists.Unordered lists.Definition list. Nesting lists. The Meta tag.		
2	**Linking Html Documents.** 2.1 URLs: Types of URLs Absolute URLs, Relative URLs, Linking HTML documents 2.2 The Anchored tag, linking to document in same folder. Linking to document in.different folder, Linking to document on the Web Linking to specific location within document. 2.3 Inserting E-mail links		

3	**Including Images:** 3.1 Image formats: GIF, JPEG, PNG. Effect of physical size and file size of image on downloading 3.2 The Inline Image, Image Alternatives. Image Alignment Height and Width, HSPACE and VSPACE Wrapping Text Image as a link. 3.3 Image Maps: Server side image Map Client-side image map		
4	**Developing Tables:** 4.1 Creating Basic tables. Tags, table, tr, td, th.Editing of Rows & Column of table. 4.2 Adding caption. Formatting tables using attributes border, border color, back ground, align, width, nowrap, cellspacing cell highting		
5	**Creating Frames &Developing Html Form** 5.1 Introduction to frames, Advantages and disadvantages of using frames. 5.2 Creating Basic Frames, Frame targeting. 5.3 Creating Forms. Form controls: Text controls, Password fields, Radio buttons, Check boxes, Reset and submit buttons. Forms control selection, option processing, hidden fields, and cookies.		
6	**Introduction to script languages:** 6.1 How to use script tag in html? VBScript: how to write script, procedure & function. Java Script: How to print output, function. Operators, loop & control statements.		

LIST OF PRACTICAL (ANY TEN)

1. Design Web page and apply some block level tags and text level tags.
2. Include horizontal rules and special character in web page.
3. Design web page and include different lists.
4. Include links in web page.
    a. Local page in same folder
    b. Page in different folder
    c. Page on the Web
    d. Specific location within document
5. Include image with different alignments and wrapped text in web page. also include image as link in the web page.
6. Design a web page and set background colour and document wide text colour.
7. Design a web page with background image, different text colour for different paragraphs, and set colours for links ,active links and visited links.
8. Create HTML table, format contents in table cells and span the rows and columns
9. Create basic frameset and format the frames within the frameset using attributes, also use frame targeting.
10. Create a basic form using different input controls and pull down menu.
11. Use table to lay out form with different form controls and generalized buttons.
12. Create a web page using script tag.

TERMWORK:

Student should submit aterm work in the form of journal containing at least 12 (Twelve) experiments or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion &Correction of journal, Level ofParticipation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCE BOOKS
FOR HTML

Sr. No.	Author	Title	Publisher
01	Sybex	Mastering HTML 4	Premium Edition
02	Ian S. Graham	THE HTML 4.0 SOURCEBOOK	--
03	William H. Murray, Chris H. Pappas	Html 4.0 User's Resource: User's Resource (Paperback)	--
04	Thomas a. Powell	HTML: The Complete Reference -	Tata McGraw Hill
05	D.S.Ray and E. J.Ray	Mastering HTML	BPB Publications

Course Code: 5G301 Course Name: ENGLISH(ENG)

Teaching Scheme		Evaluation Scheme						
TH	02		PT	TEE	TW	PR	OR	Total
PR	02	Max. Marks	20	80	25	--	--	125
TOTAL	04	Duration	1.00	3.00	--	--	--	--

RATIONALE: English is the only language used all over the world. It is necessary to gain command over English language .English is also developed as a language of International, Trade& Commerce, Library, Link language.

To help students to:

•Become competent in English Grammar and its usage.

•Write and speak English confidently correctly.

•Gain command over English language.

•Learn the modern methods of English such as sending, receiving emails to be competent with International trends.

•To use proper pronunciations

COMPETENCY STATEMENTS:

• To develop Theoretical concepts and practical implementations of English language.

• To develop writing skills.

Contents:

Sr.No.	Name of Topic	Hours	Marks
1	**TEXT FROM BOOK** 1.1 Comprehension – Responding to the questions from text (Spectrum) 1.2 Vocabulary - Understanding meaning of new words from text 1.3 Identifying parts of speech from the text.	**16**	**30**
2	**Situational Grammar** 2.1 Tenses and Time 2.2 Yes/No, Wh-questions and Question Tags, Punctuation Marks 2.3 Reported Speech; Voice ;Degree 2.4 Articles ,Prepositions, Conjunction	**10**	**25**
3	**Craft of Writing** 3.1 Paragraph Writing-Definition, Types, Essentials. 3.2 E-mail 3.3 Resume	**04**	**15**
4	**Functional English** 4.1 Vocabulary building- (Synonyms Antonyms, Homophones) Sounds and syllable Sentence structures 4.2 Use of Contextual words in a given paragraph.	**02**	**10**

CT DC HOD CDIC

List of Assignments:

1) Building of Vocabulary
Words from the glossary given at the end of each chapter, to be used to make sentences.

2) Applied Grammar
Identify the various parts of speech and insert correct parts of speech in the sentences given by the teachers.

3) Punctuation
Punctuate 20 sentences given by the teachers.

4) Tenses
List 12 tenses and give two examples for each tense.

5) Dialogue Writing
Write at least two dialogues on different situations.
(Conversation between two friends, conversation between two politicians etc.)

6) Idioms and Phrases
Use of Idioms and Phrases in sentences. (20Examples)

7) Biography
Write a short biography on your favorite role model approximately. (250 – 300) Words with pictures

TEXT BOOKS"

S.No.	Name of Book	Author	Publication
1.	Spectrum-A Text Book on English	--	MSBTE

REFERENCE BOOKS:

S.No.	Name of Book	Author	Publication
1.	English grammar and Composition	R.C.JAIN	Macmillan
2.	Dictonary	Oxford	Oxford University
3.	English at Workplace	Mukti Sanyal	Macmillan
4.	A Remedial English Grammar for Foreign Students	P.T.WOOD	Macmillan

Course Code: 5G302 Course Name: COMMUNICATION SKILLS (CMS)

Teaching Scheme		Evaluation Scheme						
TH	01		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	--	--	50	--	25	75
TOTAL	03	Duration	--	--	--	--	--	--

RATIONALE:

Language skills pertaining to English have been already introduced previously. With a view to achieve some command over a language & to develop communication skills is the main objective of this subject.

COMPETANCEY STATEMENT:

The student will be able to:

1. To develop Listening, Speaking, Reading and Writing skills.
2. Ability to engage & interact effectively with others.
3. To enable an individual to express perfectly.
4. To use appropriate body language.
5. To obtain acceptance & provide assistance, direction & leadership.

Topic no	contents	HRS	MARKS
01	**Introduction to Communication** 1.1 Definition, Importance Communication cycle/process 1.2 The Elements of communication	04	
02	**Types of Communication** 2.1 Verbal-Nonverbal, Formal – Informal, Upward-Downward, Vertical-Horizontal-Diagonal Communication.	02	
03	**Principles of Effective Communication :** 3.1 Principles of effective communication 3.2Communication Barriers & how to overcome them	04	
04	**Non Verbal Communication** 4.1 Aspects of body language(gestures ,Postures etc.) 4.2 Pictorial Representation(tables,graphs, piechart etc.)	02	
05	**Formal Written Skills** 5.1 Office Drafting: Circular, notice & memo 5.2 Job Application 5.3 Business Correspondence: Inquiry , order letter & adjustment letter	04	

List of Practicals-

01 Communication Cycle (With the Help of Diagram) + any two communications Situations to be represented with the help of Communication Cycle. (Use Pictures)
02 Speech
03 conversation
04 Group discussion
05 Non-Verbal Communication:
Body Language: Five Illustrations of appropriate use of Body Language used on the part of student in formal and Informal setups. (Example- formal setup- classroom)

06 Seminar related on any topic.
07 Interview Techniques
08 Job Application & Effective Resume Writing

REFERENCE BOOKS:

S.No.	Name of Book	Author	Publication
1.	Text book of Communication skills	MSBTE	MSBTE
2.	Everyones guide to Effective Writing	Jayakaran	Apple
3	Developing Communication Skills	Krushnan Mohan,Meera Banarji	Macmillan
4	Professional Communication Skills	Pravi S R Bhatia	s. chand&co.

Course Code: 5G303
Course Name: ENTREPRENEURSHIP DEVELOPMENT

Teaching Scheme		Evaluation Scheme						
TH	02		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks			25	--	25	50
TOTAL	04	Duration			--	--	--	--

RATIONALE:

The post liberalization industrial and economic scenario in India makes it imperative that a more dynamic and pragmatic approach be adopted to create new, first generation entrepreneurs on a large scale.

This would help in tackling the problem of unemployment and contribute to the creation of new entrepreneurs. Using knowledge & advanced technology as their strategic tools those who can take on the increased competition in the domestic as well as global markets are innovators and entrepreneurs in true sense. This can be achieved only if more and more people are motivated and convinced to choose entrepreneurship as a career and put their energies and resources to a productive use.

The student community also needs to explore the emerging opportunities. It is therefore necessary to inculcate the entrepreneurial values during their educational tenure. This will help the younger generation in changing their attitude and take the challenging growth oriented tasks instead of waiting for white- collar jobs.
This subject will help in developing the awareness and interest in entrepreneurship and create employment for others.

Objectives:
Students will be able to

- Appreciate the importance of entrepreneurship.
- Identify entrepreneurship opportunity.
- Get primary information to start any business.
- Acquire entrepreneurial values and attitude.
- Use the information to prepare project report for business venture.
- Develop awareness about enterprise management.

Course Contents:

Topic No	Name of Topic	Hours	Marks
01	**Basic Concepts** 1.1. Concept, Classification & Characteristics of Entrepreneur. Creativity and Risk taking, Concept of Creativity & Qualities of Creative person. Risk Situation, Types of risk & risk takers. 1.2 Business Idea Methods and techniques to generate business	5	

	idea 1.3 Transforming Ideas in to opportunities transformation involves Assessment of idea & Feasibility of opportunity, SWOT Analysis.		
02	**Information And Support Systems** 2.1 Information Needed and Their Sources. Information related to project, Information related to support system, Information related to Procedures and formalities.. 2.2 Support Systems: • Small Scale Business Planning, Requirements. • Govt. & Institutional Agencies, Formalities • Statutory Requirements and Agencies. • Government Support and subsidies to entrepreneur.	5	
3	**Market Assessment** 3.1 Marketing -Concept and Importance 3.2 Market Identification, Survey Key components (Market Segmentation) 3.3 Market Assessment.		
4	**Business Finance & Accounts** **4.1 Business Finance** • Cost of Project • Sources of Finance • Assessment of working capital • Product costing • Profitability • Break Even Analysis • Financial Ratios and Significance 4.2 **Business Account** Accounting Principles, Methodology • Book Keeping • Financial Statements • Concept of Audit, • Trial Balance • Balance Sheet	6	
5	**Business Plan & Project Report** 5.1 Business plan steps involved from concept to commissioning Activity Recourses, Time, Cost 5.2 **Project Report** 1) Meaning and Importance 2) Components of project report/profile (Give list) 5.3 **Project Appraisal** 1) Meaning and definition 2) Technical, Economic feasibility 3) Cost benefit Analysis	6	
6	**Enterprise Management And Modern Trends** 6.1 Enterprise Management: - 1) Essential roles of Entrepreneur in managing enterprise 2) Product Cycle: Concept And Importance 3) Probable Causes Of Sickness	5	

	4) Quality Assurance, Importance of Quality, Importance of testing 5) Industrial zones and SEZ. 6.2 E-Commerce , Concept and process 6.3 Global Entrepreneur: role and opportunities.		

Practical:

The practical task may be divided in following heads

1. Literature survey – MSFC/IDBI/MSSIDC/CIDBI/MSME/DIC/ ROLE OF DIFFERENT COMMERCIAL BANKS etc.
2. Administration of ready made tools like questionnaires, opinionnaire, Interview schedule for product identification purpose (decision making process).
3. Development of "Business Ideas".
4. Visit to MCED/MITCON- gong through the product related library.
5. Preparation of Preliminary / Detailed project report in the formats recommended by MCED/MITCON.
6. At least one case study of successful entrepreneur..

Text Books

Sr. No	Title of Book	Author and Publication
1	Entrepreneurship Development	TTTI, Bhopal.
2	The Seven Business Crisis& How to Beat them	V.G.Patel
3	A handbook of New Entrepreneurs	P.C.Jain ,Dhanpat Rai and Sons
4	Entrepreneurship development	E.Gorden, K. Natrajan.
5	New Initiatives in Enterprenuership Education And training	Gautam Jain, Debmuni Gupta
6	www.ediindia.org.	
7	Entrepreneurship Theory and Practice	J.S.Saini,B.S.Rathore
8	Enterpreneurship Development and management	A.K.Singh, Laxmi Publications
9	The Beermat Enterpreneur	Southon, Pearson Education limited

Course code: 5G304
Course name: Environmental science

Teaching Scheme		Evaluation Scheme						
TH	02		PT	TEE	TW	PR	OR	Total
PR	--	Max.Marks	--	--	50	--	--	50
TOTAL	02	Duration	--	--	--	--	--	

Rationale:

The course of environmental science /studies aims at providing the knowledge and social awareness of various s and the pollutants, wastes, effects, preliminary treatments with recycling aspects for the benefit of mankind.

COMPETENCY STATEMENT:

To understand pollution, pollution types, Electronics wastes, Effect of pollution on human being, animals and on Environments. .

Objectives:

This course contains the awareness of environmental science, pollution, Electronics wastes,

Students should be able to

- Understand the nature & environment
- Create awareness in environmental science
- Bifurcate different types of industrial wastes
- Understand the concept of pollution and its effect on environment
- Crete the awareness of norms and standards for disposal of wastes.
- Utilize the recycled waste for the benefit of mankind

Chapter	Contents	Marks	Hours
1	**1. Environment:-** 1.1 Meaning of environment, scientific aspects, burning topics on environment 1.2 Pollution:- Types of Pollutions		4
2	**2. E-waste** 2.1 Definition, Hazardous waste, 2.2 E-scrap: - copper, steel, plastic, etc 2.3 Effects of materials used in electronic gadgets and appliances, 2.4 materials used for cell phones, batteries on environment, 2.5 Risks due to e toxic, recycling and disposals 2.6 Market survey of any one type of Waste		5
3	**3. Computer recycling** 3.1 Reasons for recycling 3.2 Consumer recycling 3.3 Corporate recycling 3.4 Sale 3.5 Donation 3.6 Take back 3.7 Exchange		5
4	**4. Scrapping/recycling** 4.1 E-Cycling 4.2 Pros of e-cycling 4.3 Criticisms of e-cycling		3
5	5. Where does e-waste really go?		2
6	6. What's happening now: Policy issues and current efforts		2
7	**7. Data security** 7.1 Reasons to destroy and recycle securely		
8	**8. Waste from electronic industries**		2
9	**9. Waste water treatment** 9.2 Sludge solids, 9.3 Pollutions due to air, rejected components, soldering and manufacturing process. 9.4 Standards of pollution control board/industry for its disposal		2
10	**10. Environmental Management** 10.1 Meaning of environmental Management. 10.2 Management of any one type of waste. 10.3 Expert lecture on a) Duties of citizen and role of government b) Environmental management Assessment		5

COURSE CODE: 5S301 COURSE NAME: MICROPROCESSOR & PROGRAMMING

Teaching Scheme		Evaluation Scheme						
TH	4		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25	--	150
TOTAL	06	Duration	01	03	2	2	--	

RATIONALE:

Now a days Microprocessors are used in almost every area for controlling various parameters in industries. Hence it is essential for the Electronics Diploma holder to know the basics of the microprocessor & assembly language programming.

COMPETENCY STATEMENT:

To understand Microprocessor based systems and write Assembly language programs for various applications.

OBJECTIVES:

This course contains Architecture of 8085 microprocessor, its programming, interfacing and few applications based on it.

CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1	**Introduction to Microprocessor** 1.1 Organization of microprocessor based system, memory, input, and output. 1.2 Machine Language, Assembly language and High-Level-Language. 1.3 Types of Buses. 1.4 Features of 8-bit microprocessors such as 8085, 6800 & Z-80.	04	06
2	**Microprocessor Architecture** 2.1 Pin configuration of 8085, Functional Pin diagram of 8085 2.2 Architecture of 8085 microprocessor, Functional block diagram of 8085, reset Circuit. 2.3 Generation of control signals and demultiplexing of address/data bus	08	10
3	**Instruction Set of 8085** 3.1 Instruction Classification, Instruction format, 1,2,3 byte instructions 3.2. Addressing modes, data transfer, arithmetic, Logical, branch, I/O & machine control Instructions. 3.3 Simple programs	10	12
4	**Instruction Timing Diagram & Memory, I/O interfacing** 4.1 Instruction cycle, Machine cycle & T- State. 8085 Machine cycle and their timings, Wait state generator. 4.2.Timing diagram for 8085 instructions 4.3 Basic concepts of memory & I/O interfacing. 4.4 Absolute decoding and linear decoding,	12	14

	4.5 I/O mapped I/O & Memory mapped I/O 4.6 interfacing of RAM, ROM, EPROM to 8085.		
5	**Stack & Subroutines, 8085 Interrupts** 5.1 Use of stack by programmer, stack related instructions, 5.2 Introduction of Subroutines, CALL and RET instructions, Nested and Multiple ending Subroutines. 5.3 Delay Subroutines using registers, program based on subroutines. 5.4 Types of Interrupts interrupt structure, vectored interrupts & their priorities, RST 5.5 Instructions, EI, DI, RIM & SIM instructions.	**06**	**10**
6	**16 bit Microprocessor 8086** 6.1 Pin Configuration of 8086, 6.2 Architecture, Segment registers, PSW, 6.3 physical Address, Segmentation, Comparison 8086 & 8088.	**06**	**08**
7	**Instruction Set 8086** 7.1 Addressing mode, Data transfer, 7.2 Arithmetic, Logical, Shift & Rotate instruction, 7.3 String instruction, Bit manipulation, 7.4 Branch instruction, Processor Control instruction, Simple program based on 8086.	**14**	**14**
8	**System Configurations** 8.1 Minimum mode & maximum mode, 8.2 Clock generator 8284, Latch 8282, 8.3 Transreceiver 8286, Bus controller 8288	**04**	**06**

LIST OF PRACTICALS

1. Introduction to Microprocessor kit, instruction manual and writing simple assembly language programs.
2. To Write & Execute 8-bit & 16-bit Addition & Subtraction programs.
3. To Write & Execute Decimal addition & Subtraction programs.
4. To Write & Execute Block transfer program.
5. To Write & Execute Multiplication & Division programs.
6. To Write & Execute program to find Largest Number in given series.
7. To Write & Execute the program to arrange the given numbers in Ascending & descending order programs.
8. To Write & Execute the program to identify EVEN/ODD numbers.
9. To Write & Execute the program for Counting Of 0's & 1's in a byte.
10. To write & execute Code Conversion programs.

REFERENCES:

Sr. No	Title of Book	Author and Publication
1	Microprocessor Architecture, Programming and Application	Gaonkar (Penram International)
2	Microprocessor & Microcomputer	B.Ram (Dhanpatrai)
3	Microprocessor Principle and Application	Ajit Pal (TMH)
4	8 bit Microprocessor	Vibhute & Borole
5	Microprocessor & Microcomputer	A.P Godse (Technical)

Course Code:5G305

Course Name: INDUSTRIAL MANAGEMENT

Course Structure:

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	05	Duration			--	--	--	--

Rationale:

The diploma pass out is placed in middle management cadre in the industrial organizational set up.A proper insight and understanding of Business Processes is therefore essential for all diploma holders. Management is a subject which deals with basics of Managerial science required to understand the processes in Industrial & Commercial environment. This will enable the student to become familiar and to understand various Business processes, structures, their functioning and the role technicians in industries.

Objective:

After completion of the curricula, the pass outs will able to:

1. Familiarize environment in the world of work
2. Appreciate the importance of management process in Business.
3. Identify various components of management.
4. Understand the role & responsibilities of a Technician in an Organization.
5. Appreciate the rules and regulations pertaining to work ethics and Social Responsibilities.

Content:

Topic No	Name of Topic	Hours	Marks
01	Overview Of Business 1.1. Types of Business • Service • Manufacturing • Trade 1.2 Globalization • Introduction 1.3 Intellectual Property Rights (I.P.R.) Advantages & disadvantages with respective to India	(03) 01 01 01	6
02	Evolution of Scientific Management 2.1 Evolution of Management Concept and definition of management	(07) 01	10

	Levels of management Administration & management Scientific management by F.W.Taylor Principles of Management (14 principles of Henry Fayol) 2.3 Functions of Management • Planning • Organizing • Directing • Controlling 2.4 Organizational Management Introduction to Organization, Types of organization: Line, Line & staff, Functional Project • Centralized & Decentralized, Authority & responsibility Span of Control 2.4 Forms of ownership • Proprietorship, Partnership, Joint stock, Co-operative Society, Govt. Sector	 01 01 02 02	
3	Human Resource Management 3.1 Personnel Management: Definition and Functions 3.2 Staffing • Introduction to HR Planning • Recruitment Procedure 3.3 Personnel Training & Development Types of training Skill Enhancement 3.4 Leadership & Motivation Maslow's Theory of Motivation Front Line Supervisor Group Dynamics. 3.5 Safety Management • Causes of accident • Safety precautions,Industrial hygiene 3.6 Introduction to Factory Acts • ESI Act • Workmen Compensation Act • Industrial Dispute Act. (Introductory approach only)	(09) 01 01 02 02 02 01	15
4	Financial Management Objectives & Functions, 4.2. Capital Generation & Management	(09) 01	12

CT DC HOD CDIC

	• Types of Capitals • Sources of raising Capital 4.3 Budgets and accounts Types of Budgets Production Budget (including Variance Report) Labour Budget Introduction to Profit & Loss Account (only concepts) ; 4.4 Introduction to • Excise Tax • Service Tax • Income Tax • MOD-VAT • Custom Duty (Introductory approach only)	03 03 02	
5	Materials Management 5.1 Inventory Management -Meaning & Objectives. ABC Analysis Economic Order Quantity, Introduction & Graphical Representation. 5.2 Purchase Procedure, Objects of Purchasing, Steps in Purchasing 5.4 Modern Techniques of Material Management • Introductory treatment to JIT / SAP / ERP. (Introductory approach only)	(06) 03 02 01	10
6	Marketing Management: Introduction The Market, types of market, marketing process Selling vs. marketing, stress on customer centric approach. Marketing Segmentation: benefits, marketing information system, Objectives of Marketing research, Primary and Secondary data, Survey method, Uses of survey method, Types of survey, observation approach, panel research, experimental research, scope for marketing research in India. Sales Promotion only concept, importance of advertisement in marketing, Media selection, channels of distribution, Emergence of global marketing, international marketing environment, Multinational companies, procedure of export. (Introductory approach only)	(08) 01 02 02 02 01	12
7	**Project Management** 7.1 Project Management: Introduction ,CPM & PERT Technique Concept of Break Even Analysis (only introductory), Progress tracking with the help of bar charts. 7.2 Quality Management Definition and concept of Quality , concept of Quality , Quality Circle, Quality Assurance, TQM, Kaizen, 5 'S', & 6 Sigma. (only introductory). (Introductory approach only)	(6) 03 03	15

CT DC HOD CDIC

List of Practical:

The practical in management may consist of following task,

- Case studies.
- Guided Presentation.
- Management Games.
- Surveys.
- Data collection, Presentation and Interpretation.
- Role play/Group Discussions.
- Case Study :
- The case study approach may be applied to following subtopics of the curriculum.
- The concern teacher may select similar suitable topics for case study.
- (Any Two case studies and its presentation)
- Types of Business
- Intellectual Property Rights (I.P.R.)
- Forms of ownership
- Training & Development
- Leadership & Motivation
- Group Dynamics
- Industrial hygiene
- Sources of raising Capital
- Budgets and accounts
- MOD-VAT
- Modern Techniques of Material Management
- Marketing Segmentation
- Sales Promotion
- Quality Management
- Guided Presentation (Any two)
- Centralized & Decentralized, Authority & responsibility
    - Span of Control
- Skill Enhancement
- Safety Management
- Budgets
- JIT / SAP / ERP
- Advertisement in marketing,
- Media selection
- Global marketing
- Quality Management.
- Progress tracking
- Management Games (Any two games from following areas or like wise)
- Human Resource Management
- Marketing Management
- Materials Management
- Project Management
- Lateral Thinking
- Surveys (Any one survey form following areas or like wise)
- Training & Development
- Causes of accident
- Industrial Dispute
- Sources of raising Capital

- Inventory Management
- Customer centric approach by various business houses.
- Sales Promotion
- Product Mix
- Media selection
- Role of Multinational companies
- Impact of Quality Management parameters on project.
- Data collection, Presentation and Interpretation
- (Any one form following areas or like wise)
- Training & Development
- Capital Generation & Management
- Inventory Management
- Sales Promotion
- Media selection
- International marketing environment
- Channels of distribution
- Project Management
- Quality Management Parameters.

Course Code: 5S401 Course Name: DATA STRUCTURES (DS)

Teaching Scheme		Evaluation Scheme						
TH	4		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25	-	150
TOTAL	6	Duration	1 Hr	3 Hr.	-	2 Hr.	-	-

RATIONALE:

The study of data structure is an essential part of computer science. In system programming, application programming the method & techniques of data structures are widely used. The study of data structure helps the diploma IT students in developing a logic & structured programs.

COMPETENCY STATEMENTS:

1. To learn different Data Structures
2. To implement different Data Structures using "C" Language.

OBJECTIVE

Students will be able to :-

1. Understand concepts of arrays, stacks, queues and lists
2. Apply them in programming and Algorithms.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Introduction to data structure.** 1.1General concept of Data 1.2 Data Types, Data variables, constants 1.3Data structure and their types 1.3.1 Linear data structure 1.3.2Non linear data structure.	04	06
2	**Arrays.** 2.1Arrays and their types 2.1.1one-dimensional 2.1.2two-dimensional and multi-dimensional 2.2Defining an array and physical allocation 2.3Operations on arrays 2.3.1 Searching 2.3.2 Sorting.	08	10
3	**Linked List.** 3.1Introduction 3.2Terminologies: Node, Address, and Pointer. 3.3Information, Next, Null pointer, Empty list. 3.4Operations on list: Insertion and deletion.	10	12
4	**Stacks.** 4.1Definitions and example of stack 4.2Operations on Stack: Push, Pop 4.3Overflow and Underflow of stack	10	12

	4.4Representing stacks in C as an array and linked list. 4.5Applications of stack: In-fix, Post-fix, Pre-fix. 4.6Converting in-fix to post-fix and pre-fix 4.7Concept of recursion (with examples such as factorial, Fibonacci sequence etc)		
5	**Queues.** 5.1Introduction to queues. 5.2Definition of queues 5.3Concept of queues. 5.3.1Front,Rear,FIFO 5.3.2Over Flow, Under Flow 5.4Operations on queue: Searching, Insertion, Deletion. 5.5Types of queue 5.5.1Priority queue 5.5.2Circular queue.	10	12
6	**Trees.** 6.1Introduction 6.2Terminology:tree,sub-tree,root leaf node left right, parent, child, ancestor, descendant, brother, level and depth. 6.3Types of trees 6.3.1Binary tree 6.3.2Height balanced tree 6.3.3weight-balanced tree. 6.4Operations on trees: Searching: (Depth-first search, Breadth – first search. 6.5Traversing: Preorder, In-order, And Post-order. Insertion, deletion. 6.6Representation of tree in 'C'.	10	12
7	**Searching and Sorting.** 7.1Searching 7.1.1Linear search 7.1.2Binary search 7.2Sorting 7.2.1Bubble sort 7.2.2Selection sort 7.2.3Merge sort 7.2.4Radix sort 7.2.5Heap sort.	08	10
8	**Graphs.** 8.1Definitions and Terminology 8.2Graph Representations 8.2.1Adjacency matrices 8.2.2Adjacency lists 8.3Spanning tree 8.3.1kruskal's algorithm.	04	06

LIST OF EXPERIMENTS:

Practicals should be performed on Linux Platform.

Any 12 (Twelve) laboratory experiments and/or assignments from following list :

1. Assignments on concept of Data Structure and their Types
2. Program based on Array and their operations
3. Program based on structure union.
4. Program based on linked list and their operations
5. Program based on stack and their operations using array
6. Program based on stack and their operations using linked list
7. Program based on queue and their operations
8. Assignments on searching and sorting
9. Sorting an array.
10. Searching a particular element in array.
11. Searching a particular element by using Binary Search.
12. Sorting an array by using bubble sort
13. Sorting an array by using selection sort.
14. Sorting an array by using Merge sort.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher & Edition
01	Yashwant Kanetkar.	Data Structure using C	BPB Publications
02	Shukla	Data Structure using C Lab work	BPB pub
03	Gregory Heilman	Data structures, Algorithms and oops	Mc-GrawHills
04	Lafore	Teach yourself data structure and Algorithms in 24 Hrs	BPB pub.
05	Horowitz and Sahani.	Fundamentals of data structures	

Course Code: 5S402 Course Name: REIATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

Teaching Scheme		Evaluation Scheme						
TH	4		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25	-	150
TOTAL	6	Duration	1 Hr	3 Hr.	-	2 Hr.	-	-

RATIONALE:

Every organization / establishment/ office / shops needs to keep records of day-to-day activities. If these records are kept on computer then it will be very easy for maintenance and quick retrieval. It will help to make correct and quick decision. Regular as well as adhoc reports can be quickly generated. This helps low, middle and even top level management of an organization for decision making.

COMPETENCY STATEMENTS:

1. Student will able to create database & maintain database.
2. Write & execute SQL queries
3. Normalize the database
4. Develop concepts of data modeling, security and integrity

OBJECTIVE

Students will be able to :-

1. Create databases and maintain database.
2. Understand DBM and RDBM systems.
3. Understand concepts of database system and client server architecture
4. Design database applying normalization rules
5. Understand and use power of SQL
6. Apply database integrity, constraint and security

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Database System Concept & Data Modeling** 1.1Basic concepts 1.2 Advantages of a DBMS over file processing system 1.3Data Abstraction 1.4Database Languages 1.5Data Independence. 1.6Components of a DBMS and overall structure of a DBMS. 1.7Data Models 1.7.1Network Model 1.7.2Hierarchical Model 1.7.3E-R Model 1.8 Client Server Architecture	11	14

CT DC HOD CDIC

2	**Relational Data Model and Integrity Specification** 2.1Relational Model 2.1.1Basic concepts 2.1.2 attributes and domains 2.2 Keys concept: Candidate and primary key 2.3 Integrity constraints: Domain, Entity Integrity constraints and On delete cascade 2.4 Security and Authorization	11	14
3	**SQL and PL-SQL** 3.1Introduction to SQL queries 3.2Creating, Inserting, Updating and deleting tables and using constraints 3.3Set operations & operators, Aggregate functions 3.4string functions and date, time functions, Null values, 3.5Nested sub queries, Join concepts. 3.6PL/SQL Introduction, PL/SQL block structure, variables, SQL statements in PL/SQL, PL/SQL control Structures, Cursors, Triggers, Functions, Packages, procedures, Error handling in PL/ SQL	14	16
4	**Relational Database Design** 4.1Functional Dependencies and Normalization for Relational database 4.2Decomposition 4.3Process of Normalization using 1NF, 2NF, 3NF, multivalued 4.4dependencies and BCNF. 4.5E-R Model details.	12	14
5	**Query Processing** 5.1Query Languages: Relational Algebra, Relational Calculus 5.2Views. 5.3General strategies for query processing 5.4 Equivalence expressions 5.5 Selection & join operation	10	12
6	**Storage and File systems** 6.1File Organization 6.2 Organization of records in files 6.3Storage of Object Oriented databases 6.4 Basic concept of Indexing and Hashing.	06	10

LIST OF EXPERIMENTS:

Practical's should be performed in PL/SQL and MYSQL.

Any 12 (Twelve) laboratory experiments and/or assignments from following list :

1) Creating & Executing DDL in SQL.
2) Creating & Executing Integrity constraints in SQL.
3) Creating & Executing DML in SQL.
4) Executing relational, logical and mathematical set operators using SQL.
5) Executing group functions
6) Executing string operators & string functions.
7) Executing Date & Time functions.
8) Executing Data Conversion functions.

9) Executing DCL in SQL.
10) Executing Sequences and synonyms in SQL.
11) Execute SQL queries (operators, functions, clauses, join concepts)
12) Program for declaring and using variables and constant using PL/SQL.
13) Program using if then else in PL/SQL
14) Program using for loop & while loop in PL/SQL.
15) Program using nested loop in PL/SQL.

TERMWORK:
Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:
The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

TEXT BOOKS

S.No.	Name of Book	Author	Publication
01	Database system concepts	Henry Korth	Tata McGraw Hill
02	Introduction to Database Management system	Navin Prakash	Tata McGraw Hill
03	Using Oracle 8	William Page Jr.And Nathen Hughes Abraham stlberschaty	Prentice Hall of India
04	An Introduction toData Base System	C.J.Date	Addison Wesley publication
05	SQL Professional TMH	Swapna Kishore..	
06	Database Management System	Bipin Desai	
07	Fundamental of Database System	S. B.Navathe	Pearson Ediction

CT DC HOD CDIC

Course Code: 5S403 **Course Name: Computer Networks**

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	06	Duration	1.00	3.00	--	--	--	--

RATIONALE:

Today is age of Information Technology. In many applications, we send information from one place to another place. So networking of computer is very essential. The many business applications like Railway reservation, Industrial sale, purchase, Industrial automation, on line Banking, E-business, E-Commerce and many applications. All this applications and many other require knowledge of computer network. Computer network organize information from hundreds of offices spread over wide geographical area and output remote information at a push of button. This gives type of network. Two or more computer interconnected through via copper wire, fiber optics, and microwave, infrared and satellite i.e. wire and wireless communication. Here we set basic concept of networking, its applications, topologies, communication media, and network directing devices, protocol used, OSI reference model and TCP/IP model.

COMPETENCY STATEMENTS:

To understand concepts of data communication.
To understand theoretical concepts related to design, protocol, interfaces and configure the computer network.

COURSE OBJECTIVES:

Students will be able to:-
1. Identifying the benefits of network.
2. Distinguish between Network classifications.
3. Describe different types of Topology.
4. Describe different types of Network devices.
5. Compare different transmission media.
6. Compare OSI and TCP/IP model.
7. Configure TCP/IP.

COURSE CONTENTS:-

	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Concept of Data Communication & Networking** 1.1 Data Communication – Protocols. 1.2 Standards. 1.3Standards Organizations. 1.4 Signal Propagation - Analog & Digital Signals. 1.5 Bandwidth of signal & a medium. 1.6 Data transmission rate and the bandwidth.	08	08

CT DC HOD CDIC

2	**Basic Network Concepts** 2.1 Understanding Network - Human Networks. 2.2 Computer Networks, Network Plan. 2.3 Identifying the Benefits of Network - Sharing Information, Sharing Resources. 2.4 Facilitating Centralized Management –Managing Software, Maintaining the Network, Backing Up Data. 2.5 Distinguishing Between Network classifications - Classifying Networks by their Geography – LAN, MAN, WAN, Classifying Networks by their Component Role - Peer to Peer, Server based Network. 2.6 Network Features - File Sharing, Printer Sharing, Application Services, E-Mail; Remote Access.	14	16
3	**Network Topologies and Networking Devices** 3.1 Type of Topology - Bus Topology, Ring Topology, Star Topology, Mesh Topology, Tree Topology, Hybrid Topology. 3.2 Network Control Devices –Hubs, Switches, Routers, Bridges, Repeaters, Gateways, Modems	10	14
4	**Transmission Media** 4.1 Guided Media -Twisted Pair -UTP, STP 4.2 Coaxial Cable, Optical Fiber - Optical Fiber Structure, Light Source for Fiber, Propagation Mode, Advantages of optical fiber, Disadvantages of optical fiber. 4.3 Un-Guided Media: Wireless Communication–Communication Band, Microwave Communication, Satellite Communication – Access Method, Cellular (Mobile) Telephone – Band in Cellular Telephony, Calls Using Mobile Phones, Transmitting receiving operations, New Developments.	14	16
5	**Network Reference Model** 5.1 OSI Reference Model - Interlayer Communication – Data Encapsulation, Horizontal Communication, Vertical communication, Encapsulation Terminology 5.2 Physical layer, Data link layer, Network layer, Transport layer, Session layer, Presentation layer, Application layer. 5.3 TCP/IP Reference Model – Link, Internet, Transport. 5.4 Application layer. Comparison of the OSI and TCP/IP reference models.	10	14
6	**TCP/IP Fundamentals** 6.1 TCP/IP Protocols - SLIP and PPP, ARP, IP, ICMP, TCP and UDP. 6.2 IP Addressing - IP Address Assignments, IP Address Classes, Subnet Masking, Registered and unregistered Addresses. 6.3 TCP/IP Configuration - Installing the TCP/IP Protocol, Configuring TCP/IP - Configuring Basic TCP/IP Properties, Configuring Advanced TCP/IP Properties.	8	12

LIST OF EXPERIMENTS:

Any 12 (Twelve) laboratory experiments and/or assignments from following list:

1) Basic of Computer Network Lab.
2) Basic of TCP/IP utilities and commands. (eg: ping, ipconfig, tracert, arp, tcpdump, whois, host, netsat, nslookup, ftp, telnet etc…)
3) To connect Computers in different ways in a Local area Network (Topologies)
4) To connect and understand different network control devices used in a Local Area Network
5) To study transmission media.
6) To create a network cable using RJ-45 connectors.
7) To connect two hubs by creating crossover connection
8) To install a network interface card
9) To install TCP/IP protocol and configure advanced TCP/IP properties
10) T o locate MAC address of Computer
11) To install a network printer
12) Case Study of existing College network with IP Address Scheme.
13) Network design and implementation for small network using actual physical components with IP address scheme.
14) Installation and configuration of APACHE WEB SERVER / IIS /PWS along with HTTP server.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:

Oral examination will be based on the term work submitted by the student and the theory of the subject.

TEXT BOOKS"

S.No.	Name of Book	Author	Publication
1.	Data Communication & Networking	Achyut S. Godbole	Tata McGraw-Hill Edition
2.	Data Communication & Networking	B.A. Forouzan	Tata McGraw-Hill Edition 4th Edition
3.	Computer Networks	Andrew S. Tanenbaum	Tata McGraw-Hill Edition
4	Introduction to Networking	Richard A. McMohan,Sir	Tata McGraw-Hill Edition
5	Complete Reference Networking	Craig Zacker	Tata McGraw-Hill Edition

COURSE CODE: 5S404
COURSE NAME: DOT NET TECHNOLOGIES

Teaching Scheme		Evaluation Scheme						
TH	--		PT	TEE	TW	PR	OR	Total
PR	04	Max.Marks	--	--	50	50	--	100
TOTAL	04	Duration	--	--	--	04	--	--

RATIONALE:

In the present era of Information technology, C# is a powerful tool used for developing user friendly and platform independent applications that run under Windows using its dot net Framework. This will concurrently generate related basic competencies required for designing and developing future practical and lifetime major projects.

COMPETENCY STATEMENT:

Use C# as the programming platform to develop business applications.

OBJECTIVE:

After completing this course, student will be able to
1. Understand working in .Net Framework
2. Develop User Friendly applications in C#.
3. Develop visual Windows Forms designer.

CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1.	**Introduction to Building Blocks of the .NET Platform** 1.1 CLR, CTS, and CLS, The Role of the Base Class Libraries 1.2 Core C# features, The Role of the Common Intermediate Language 1.3 The Role of .NET Type Metadata, Understanding the Common Type System. 1.4 Building .NET Applications Using Sharp Develop: introduction to C# in .net platform.		
2.	**Core C# Programming Constructs** 2.1 a Simple C# Program, Variations on the Main() Method, 2.2 Specifying an Application Error Code, Processing Command-Line Arguments, 2.3 The System. Console Class, System Data Types and C# Shorthand Notation, 2.4 Variable Declaration and Initialization, Narrowing and Widening Data Type Conversions, 2.5 C# Iteration Constructs (loops), Decision Constructs (statements), 2.6 Methods and Parameter Modifiers: defining, accessing. 2.7 C# Arrays: Array Initialization Syntax, Defining an Array of Objects, Understanding the Enum Type, 2.9 Understanding the Structure Type, Understanding Value Types and Reference Types, C# Nullable Types		
3	**Object oriented concepts in C#** 3.1 Class, inheritance, polymorphism, 3.2 structured exception handling, 3.3 Object lifetime, interface, Delegates, Events, and Lambdas.		

4	**Programming with Windows Forms Controls** 4.1 Windows Forms Control Hierarchy, Adding Controls to Forms (IDE-Free), Adding Controls to Forms (via VS .NET), 4.2 The TextBox Control, Button Control, Radio button Control, Checkbox Control, Listboxes & comboboxes Control, 4.3 The MonthCalendar Control, DateTime Type, Assigning ToolTips to Controls, TrackBar Control, Working with Panel Controls, 4.4 The UpDown Controls: DomainUpDown and NumericUpDown, Configuring a Control's Anchoring Behavior, 4.5 Configuring a Control's Docking Behavior, Building Custom Dialog Boxes, Creating the Images, Controlling the Animation,		
5	**Data Access with ADO.NET** 5.1 The Need for ADO.NET, The Role of ADO.NET Data Providers, 5.2 Types of System.Data, Examining the DataColumn Type, DataRow type, Building a Complete DataTable, 5.3 Understanding the DataView Type, the Role of the DataSet, Building a Simple Test Database, Selecting a Data Provider, The 5.4 Types of the System.Data.OleDb Namespace, Working with the Connected Layer of ADO.NET, 5.5 Working with the OleDbDataReader, Inserting, Updating, and Deleting Records Using OleDbCommand, 5.6 Executing a Stored Procedure Using OleDbCommand, Working with the SQL Data Provider		

LIST OF EXPERIMENTS:

1. Introduction to .net platform.
2. Simple C# program
3. Program for implementing loops
4. Program for implementing decision statements
5. Program for implementing array
6. Program for implementing structure
7. Program for implementing class & inheritance
8. Program for implementing interface
9. Program for implementing exception handling
10. Program for implementing Delegates
11. Program for implementing events
12. Implement a program to create window's form using different control.
13. A program to create form using database connectivity.

TERMWORK:

Student should submit a term work in the form of journal containing above assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

In practical hours teacher should clear all the theoretical and practical features of student of respective practical. Lecturer should demonstrate the idea by taking example and demonstrate the key concepts in each practical assignment.

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

Reference Book:

Sr.No.	Book title	Author	Publisher
1	**Pro C# 2010 and the .NET 4 Platform, Fifth Edition**	Andrew Troelsen	Paul Manning
2	**C# and the .NET Platform, Second Edition**	Andrew Troelsen	
3	**CLR via C#**	Jeffrey Richter	Microsoft Press

Course Code: 5T405 **Course Name:** Object Oriented Programming using C++

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	25	--	150
TOTAL	06	Duration	01	03	--	--	--	--

RATIONALE:

Object Oriented Programming approaches real - life situations more closely than any other programming methodologies. C++ was the first language to implement Object oriented Programming and is still considered to be the most elegant language for Object Oriented Programming.

COMPETENCY STATEMENTS:

Students will be able to write Object oriented programs, which will be more compact, portable, efficient and easier to maintain.

OBJECTIVE:

1. Features of oops.
2. Understand the power of C++, which makes them most powerful for project management and maintenances.
3. Understand bottom-up approach.
4. Understand OOP's based S/W packages, languages with little additional efforts on their own.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
01	**Concept of Object Oriented Programming.** 1.1 It's need & requirement, 1.2 procedure oriented programming versus object oriented programming, 1.3 basic concepts of object oriented programming, 1.4 benefits of OOP, object oriented languages	04	06
02	**Introduction To C++** 2.1 Concepts & structure of C++ programming, 2.2 Using cin and cout statements, input & output operators, writing comments, cascading of I/O operators, 2.3 basic data types in C++, User defined data types, Derived data types, 2.4 declaration & dynamic initialization of variables, 2.5 operators in C++, manipulators, expressions & their types, operator precedence, 2.6 Control structures, 2.7 main function, function prototyping, 2.8 call by reference, return by reference, 2.9 inline function, default arguments, 2.10 function overloading, friend & virtual function	08	08
03	**Objects & classes** 3.1 C structures, 3.2 Specifying a class, Defining member functions, nesting of member functions, private member functions, 3.3 Arrays within a class, Arrays of objects 3.4 Creating objects, memory allocation for objects, 3.5 static data & member function, 3.6 objects as function argument. Returning objects.	10	12
04	**Constructors and Destructors.** 4.1 Constructors, parameterized constructor, multiple constructors in a class, Constructor with default argument, 4.2 dynamic initialization of objects, copy constructor, dynamic constructor, 4.3 Destructors. 4.4 Operator overloading, overloading unary & binary operators, rules for	08	08

	overloading operators, type conversions.		
05	**Inheritance** 5.1 Concepts of inheritance, defining derived classes, Member declaration (Protected), 5.2 Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance), 5.3 Virtual base classes, Abstract classes, 5.4 Constructors in derived classes, Member classes.	**08**	**10**
06	**Pointers in c++** 6.1 Concepts of pointer (Pointer declaration, pointer operator, address operator, pointer expressions, and pointer arithmetic), 6.2 using pointers with arrays & strings, arrays of pointers, pointers to functions, pointers to objects, 6.3 this pointer, pointers to derived classes, 6.4 virtual functions, rules for virtual functions	**10**	**10**
07	**Polymorphism** 7.1 Concepts of polymorphism, types of polymorphism, 7.2 Overloading & overriding, 7.3 Virtual function, Static & dynamic binding.	**06**	**09**
08	**Basic function of I/O system basics & File Processing** 8.1 Stream classes, 8.2 using formatted & unformatted functions, 8.3 using manipulator to format I/O, 8.4 Basics of file system, opening & closing a file, 8.5 reading & writing character from a file (get, put, getline, write), 8.6 Command line arguments.	**10**	**12**

LIST OF PRACTICALS:

(Any twelve programs from the following covering entire syllabus of the above)

1. Programs to input & output data (Simple programs).
2. Programs to create object of class
3. Programs to create arrays of objects
4. Program to access static member variables
5. Programs using object as function arguments using friend function.
6. Programs to define Class using constructor & destructor.(Default constructor ,Multiple constructor, Copy constructor, Overloaded constructor)
7. Program using constructor with default argument
8. Program to overload unary & binary operator
9. Single inheritance & multilevel using protected member
10. Multiple inheritance & virtual base class
11. Program for pointers to arrays of integer
12. Program for pointers to strings
13. Program for pointers to objects
14. Program for **this** pointer.
15. Program for (virtual functions) runtime polymorphism
16. Programs for overload function
17. Format output using manipulators & own manipulator.
18. Program for file processing

TEXT BOOKS

S.No.	Name of Book	Author	Publication
01	Object Oriented Programming in Turbo C++	Robert Lafore	GALGOTIA
02	Object Oriented Programming with C++	Balguruwami	TMH
03	Let's C++	Kanetkar	BPB

COURSE CODE: 5T406 COURSE NAME: JAVA PROGRAMMING

Teaching Scheme		Evaluation Scheme						
TH	3		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25	--	150
TOTAL	05	Duration	1	3	--	2	--	--

RATIONAL:

JAVA language enhances and refines the object oriented paradigm. It is essential to adopt refinement and improvement in the art of the programming. JAVA support development of dynamic network base application, which is secured, reliable, portable, extensible and reusable. This subject knowledge is essential for development of customize and web base applications. JAVA being platform independent language and free ware software, the measure business applications worldwide being based on JAVA technology. Learning JAVA becomes essential.

Further this subjects who include learning core java forms a foundation for learning advanced java.

COMPETENCY STATEMENT (S):

1. To understand basic JAVA concept.
2. To use computer for java based application.
3. To prepare professional project

COURSE OBJECTIVES:

After study this subject, the student will be able to

1. Design and implement classes and methods.
2. Understand and implement basic programming constructs
3. Apply object oriented features to real time entities
4. Differentiate between primitive data type and class data type and implement conversion between them
5. Understand and implement a concept of reusability and extensibility
6. Create packages and interface and use it in programs
7. Design and implement multithreaded programs
8. Mange error and exceptions
9. Design and implement applet and graphics programming
10. Make use of data string in program
11. Write program by combining all features of java

CONTENTS:

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1.	**An Introduction To Java Programming** 1.1 Definition of JAVA ,Getting started with JAVA ,difference between java, c, c++, 1.2 Rules & Structure of JAVA ,java features, 1.3 variable and data types , declaring variables, variables assigning, literal, number literal, Boolean literal, expression 1.4 operators-arithmetic operator, relational operator, logical operator, assignment operator, increment &decrement operator,	06	12

	operator precedence 1.5 Arrays, declaring array variable, creating array objects , accessing array elements multidimensional array 1.6 Strings data type, string functions. 1.7 Decision making statement: if statement, if-else statement, Switch statement. 1.8 Loop statement: for loops, while & do loops , while loops. do.... While loops, breaking out of loops.		
2.	**Classes &Object, Inheritance** 2.1 Defining classes, creating instance & class variables, creating classes. 2.2 Defining Objects passing arguments, passing arguments JAVA programmes, Method overloading. 2.3 Constructor, constructor overloading, this keyword 2.4 Vectors, Wrapper classes, command line arguments, garbage collector. 2.5 Inheritance: creating subclasses, single inheritance, super keyword, multilevel inheritance, hierarchical inheritance 2.6 method overriding, final keyword, finalize method, abstract method & class	**10**	**16**
3	**Interface &Packages** 3.1 Interface: Defining interface, Extending interface, implementing interface, accessing interface variable. 3.2 Packages: creating packages, accessing packages, adding class to a package, putting classes together, creating package within a package.	**06**	**10**
4	**Java Applet & Graphics** 4.1 Introduction to applets & application, How applets & application are different, 4.2 applet life cycle, applet tag, creating applets & parameters to applets. 4.3 Working with frame windows, creating a frame window in applet, display information within a window. 4.4 Creating Graphics & Colors: graphical class, lines, rectangle, circle & ellipse, drawing arc, drawing & fillings text & font, creating font objects, using color objects	**8**	**14**
5	**Multithreaded Programming & Exception Handling** 5.1 What is thread, life cycle of thread, 5.2 creating thread: by extending thread class and implementing runnable class. 5.3 Stopping & blocking a thread, thread exception, thread priority, synchronization, 5.4 Creating animation in JAVA, writing applets with threads. 5.5 managing errors & Exception: types of error, exception, exception handling using try-catch statements, 5.6 throws exception	**10**	**14**
6	**File I/O stream classes(H-08, M-14)**	**08**	**14**

	6.1 I/O stream classes: Input stream classes, 6.2 Output stream classes, Byte stream classes, 6.3 Character stream classes, 6.4 other I/O stream classes: random access file, stream tokenizer.		

LIST OF PRACTICALS

1. Write a simple java program .
2. Write a java program using Statements, Expression Operator & Function , Condition, Loop, Switch, Array
3. Write a java program to demonstrate use of Classes With Objects.
4. Write a java program to demonstrate use of Subclasses.
5. Program To Create Instance & Class Variable, Method.
6. Write a java program to demonstrate use of Command Line Argument.
7. Write a java program Using Method Overriding.
8. Write a java program to implement concept of threading
9. Write a java program to implement concept of Exceptional handling
10. Write a Simple Program On Applets.
11. Write a java program Using Graphics To Draw ,Fill, Use Color

12 Create Small Application For frame

13. Create Small Application using graphics in frame
14. Implementation of I/O stream classes.

TERMWORK:

Student should submit aterm work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion &Correction of journal, Level ofParticipation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	Patrick Naughton, Herbert Schildt	Complete reference for java	Tata McGraw Hill
02	E. Balaguruswami.	Programming with java	BPB
03	Keyur Shah	Java2 Programming	Tata McGraw Hill
04	John R.Hubbard	Programming with Java	Tata McGraw Hill

COURSE CODE: 5T407 **COURSE NAME: OPERATING SYSTEMS**

Teaching Scheme		Evaluation Scheme						
TH	4		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25		150
TOTAL	6	Duration	1 HRS	3 HRS				

RATIONAL:

To meet the ever-increasing need of computers, network and internet study of operating system is compulsory. Operating system is the interface between the user and the computer system; It is the first piece of software to run on a computer system when it is booted. Its job is to coordinate and provide services for the execution of application software's, This is core technology subject and the knowledge of which absolutely essential for computer engineers. It is familiarize the student with the concept and function of operating system.

This subject provides the knowledge to develop system using advance operating system concepts.

COMPETENCY STATEMENT(S):

1.To understand internal architecture of operating System.
2.To work on different types of Operating system.

COURSE OBJECTIVES:

Student will be able to

1. Understand the features and function of operating system as provided by the various system calls.
2. Understand process, deadlock and the concept of context switching and multiprogramming.
3. Use memory management and file management techniques.
4. Understand the tools and the components of the operating system.
5. Implement various algorithms of scheduling.
6. Compare and contrast the various standards solutions to operating system problems.
7. Make best use of facilities that computer system offers them for solving problems.

CONTENTS:

Unit No.	Contents/Chapter/Unit Contents	Hours	Marks
1	**Introduction** **1.1**Introduction to an operating system 1.2Evolution of an operating system 1.3Generations of Operating system: 1st, 2nd, 3rd, 4th. 1.4 Batch operating system, sequential operating System, multiprogramming operating system, multitasking operating system, time sharing Operating system, distributed operating system, real time operating system, embedded Operating system, network operating system, mobile operating system, server operating System, open source Operating system, 1.5Structure of Operating system (Simple Structure, Layered, Monolithic, Microkernel), operating system services 1.6System components- main memory management, file management, Input-Output Management, secondary storage management, 1.7System Calls: uses, process control, file management, device management, information Management, communication. Virtual machine: history, benefits, Java Virtual machine	13	16
2	**Process management:** 2.1The process model, process state, process control block, context switch. 2.2Threads: Benefits, user and kernel threads. 2.3Multithreading models: many-to-one, one-to-one, many-to-many model. 2.4Inter process communication, race condition, critical section, mutual exclusion with busy Waiting, sleep and wakeup, semaphores, monitors, 2.5message passing, classical IPC problem, Dining philosopher's problem, reader's writer's problem.	13	16
3	**Scheduling:** 3.1Scheduling objectives, concepts, criteria, CPU- Input-Output cycle. 3.2Scheduling algorithm: First come first serve (FCFS), shortest job first (SJF), priority Algorithm, Round Robin algorithm, multilevel queue, real time algorithm. 3.3Dead Lock: Principal necessary conditions for deadlock, system modeling, mutual exclusion, Critical region, 3.4deadlock handling, deadlock resources, deadlock modeling, deadlock Detection, deadlock recovery. Ostrich algorithm, Bankers algorithm, deadlock prevention.	13	16
4	**File system and Memory Management:** 4.1File concept, attributes, operations, types, structure, access methods- Sequential, direct. 4.2Directory structure- single level, two level, tree structure, Hierarchical directory system, 4.3Directory operations, file allocation methods- contiguous, linked list with indexing, I nodes 4.4Protection- Types of access, access control list,	13	16

	Multiprogramming with partitions relocation and protection. 4.5Free space management technique- Bitmap, linked list.		
5	**Virtual memory management:** 5.1Background, paging and segmentation, swapping, demand paging, page table, page fault, 5.2Thrashing, page replacement algorithm (First in first out, optimal page replacement Algorithm, least recently used, most recently used Algorithm) 5.3Allocation of frames, fragmentation (Internal and External).	12	116

TERM WORK / PRACTICAL

The assignment should be conducted during the, Course based on above syllabus and a record for the same shall be submitted.

1. Identify the major desktop components, interfaces and their functions Differentiate the various Windows operating System (Windows 9x, windowsNT, windows 2000 & windows XP.).
2. Installation of windows 98, 2000, 2003 server, XP, Vista.
3. Write & execute the program to implement first come first serve (FCFS) Scheduling.
4. Write & execute the program to implement shortest job first (SJF) Scheduling.
5. Write & execute the program to implement priority Algorithm Scheduling.
6. Write & execute the program to implement Round Robin algorithm Scheduling
7. Write & execute the program to implement Bankers algorithm
8. Write & execute the program to implement first In first Out page replacement algorithm
9. Write & execute the program to implement Least recently used (LRU) replacement algorithm
10. Write & execute the program to implement First Fit, Best Fit, Worst Fit algorithm
11. Case study of XP.
12. Case study of LINUX.

REFERENCES BOOKS :

Sr. No.	Author	Title	Publisher
01	Galvin	Operating sysyem	
02	Tananbaum	Operating Systems	
03	William Stallings	Operating Systems	PHI
04	Milenkovic	Operating Systems	Tata McGraw Hill Publication
05	Achyut S. Godbole	Operating Systems	Tata McGraw Hill Publication

Course Code: 5T408 **Course Name: Software Engineering**

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	--	Max.Marks	20	80	--	--	--	100
TOTAL	04	Duration	01 Hour	03 Hours	--	--	--	

RATIONALE:

Today Software is the only important technology which touches every aspect of human life. Software is the key element in the evolution of Computer-based systems and products. Over the past 50 years, software has evolved from a specialized problem solving and information analysis tool to a big software development industry. Software is composed of programs, data, data structures and documents. Each of these items comprises a configuration that is created as part of the software engineering process. The intent of software engineering is to provide a framework for building software with higher quality. This subject also helps the students to develop, design, analyze, implement & document the software project during the final year of diploma course.

COMPETENCY STATEMENTS:

Students will develop software as per engineering and scientific approach

1. Outline the role of software evolution & its characteristics
2. Explain the techniques used in software process
3. Differentiate & select appropriate process model for software project
4. Analyze the phases of software Engineering
5. Gather requirements for software project
6. Analyze requirements & build analysis model
7. Explain software design principles
8. Create architectural design
9. Design user interface

OBJECTIVE :

Students will be able to

1. Plan & develop the frame work of project.
2. Compare various project process models & use in project planning.
3. Use the principles of communication, planning, modeling construction &
4. deployment.
5. Perform requirements engineering process
6. Build analysis model and specifications
7. Design software model
8. Create Architectural design
9. Design class based components
10. Perform user interface design

COURSE CONTENTS:-

Sr. No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
01	**An Introduction to Software Engineering** 1.1 The evolving Role of software 1.2 software, changing nature of software 1.3 software myths	04	06
02	**Software Process** 2.1 Software Engineering –A layered Technology approach 2.2 A process framework, CMMI, Process patterns ,process	16	20

	Assessment 2.3 Personal & Team Process models, Process Technology 2.4 Process Models –Waterfall ,Incremental, RAD, Prototype, Spiral, Concurrent Development Model, Component Based Development, The formal Methods model		
03	**Software requirements Engineering** 3.1 Software Engineering core principles 3.2 Communication Practices, Planning practices, Modeling Practices, Construction Practices, Deployment practices 3.3 Requirements Engineering Tasks, Initiating the requirement process, eliciting requirements, building the analysis model, negotiating requirements, validating requirements	**16**	**20**
04	**Building Analysis Model** 4.1 Requirement analysis, Analysis modeling approaches 4.2 Data modeling concepts, Object-oriented Analysis, Scenario based modeling, Flow oriented modeling, Class-Based modeling, 4.3 Creating a behavioral model.	**10**	**12**
05	**Software Design Engineering** 5.1 Design approaches of software engineering 5.2 Design process & quality, Design concepts, Design model, pattern based design	**08**	**10**
06	**Software Architectural & User Interface Design** 6.1 Software architecture, Data design 6.2 Architectural styles & patterns, designing class based components 6.3 Performing user interface design-golden rules, user interface analysis & design, interface analysis, interface design steps 6.4 Software reengineering, reverse engineering	**10**	**12**

TEXT BOOKS

S.No.	Name of Book	Author	Publication
01	Software Engineering-A Aractioner's Approach (Sixth Edition)	Roger S. Pressman	Tata McGraw Hill
02	Software engineering- Principles and Practices	Waman S. Jawadekar	Tata McGraw Hill

Course Code: 5T409 **Course Name: Network Management & Administration**

Teaching Scheme		Evaluation Scheme						
TH	01		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	--	--	50	--	50	100
TOTAL	03	Duration	--	--	--	--	--	--

RATIONALE:

It is an era of computers. In each and every field, computers are used for different applications. So, personal computer users have a need to connect their intelligent workstation to other computers for sharing peripherals such as printers with a user at another personal computer. The users may have a need to access data or execute applications software that resides on another computer. Again the user may need special processing capabilities that are only available on the other computer. The task of connecting our stand-alone computers often requires a thorough knowledge of connectivity, hardware and software. It provides practical knowledge that will enable the students to get a connectivity job done quickly and easily so the students can get on with the applications and data sharing work they need to do. This subject is network application based subject. It gives the practical knowledge of designing computer network while using any type of topologies. This subject covers the installation and configuration of any network operating system. With the proper configuration of operating system on the server, the students will manage and administer the network resources or devices such as printers, scanner, driver and also software like files, folders, directories, applications, programs etc

COMPETENCY STATEMENTS:

1) To installed & maintained Network Operating Systems.
2) To acquire the knowledge of Administration and management of Network operating Systems.

OBJECTIVE:

Students will be able to:-

1. Compare different types of network.
2. Describe the different types of network directory services.
3. Design the computer network.
4. Configure the networking resources and software from the server.
5. Know the network management and administration.
6. Apply the different types of network technologies for internet connection.
7. Troubleshoot and repair the network faults.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Exploring Directory Services and Remote Network Access.** 1.1 Network Related Jobs – Network Administrator, Network Engineer, Network Architecture / Designer, Other Network Related Jobs. 1.2 Directory Services - Define Directory Services, Definition of Novelle Directory, Windows NT domains, Microsoft's Active Directory, X500Directory Access Protocol, Lightweight Directory Access Protocol, Forests, Trees, Roots and Leaves. 1.3 Active Directory Architecture – Object Types, Object Naming, Canonical Names, LDAP Notation, Globally unique identifiers, User Principle Names, Domain, Trees & Forests. 1.4 Remote Network Access – Need of Remote Network Access, Public Switched Telephone Network, Integrated Services Digital Network, Digital Subscriber Line, CATV. 1.5 Virtual Private Network – VPN Protocols, Types of VPNs, VPN Clients,SSL VPNs.	4	--
2	**Network Connection and Printing Services.** 2.1 Dynamic Host Configuration Protocol (DHCP) – DHCP Origins, Reverse Address Resolution Protocol (RARP), The Bootstrap Protocol (BOOTP), DHCP Objectives, IP Address Assignment, DHCP Architecture. 2.2 Introduction to Domain Name System(DNS) - DNS Objectives, Domain Naming, Top Level Domains, Second Level Domains, Sub domains, DNS Functions, Resource Records, DNS Name Resolution, Resolves, DNS Requests, Root Name Servers, Resolving a Domain Name, DNS Name Registration. 2.3 Understand Network Printing Concepts - Understand Network Printing Concepts, Locally connected print devices, Setting up local print devices, Shared print devices, Sharing Locally Attached Print Devices, Describe Windows Network Printing, Add Print Wizard.	3	--

3	**Implementation of Network** 3.1 Designing Network – Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning, Meeting Network Needs – Choosing Network Type, Choosing Network Structure, Choosing Servers. 3.2 Installing and Configuring Windows 2003 Server - Preparing for Installation, Creating windows 2003 server boot disk, Installing windows 2003 server, Configuring server/ client 3.3 Setting windows 2003 server - Creating Domain controller, Adding the DHCP and WINS roles, Adding file server and print server, Adding Web based Administration.	3	--
4	**Administering Windows 2000 Server (The Basics)** 4.1 Working With User Accounts - Adding a User, Modifying User Account, Deleting or Disabling a User Account. 4.2 Working With Windows 2000 Security Groups – Creating Group, Maintaining Group Membership. 4.3 Working with Shares – Understanding Share Security, Cresting Shares, Mapping Drives 4.4 Administering Printer Shares – Setting up Network Printer, 4.3 Working with Windows 2000 Backup – Using Windows 2000 Servers Backup Software	3	--
5	**Troubleshooting and security of Network** 5.1 Understanding the Problem – Troubleshooting, Segmenting the Problem, Isolating the Problem, Setting Priorities. 5.2 Troubleshooting Tools – Hardware Tools, Software Tools, Monitoring and Troubleshooting Tools 5.3 Internal Security – Account Security, File and Directory permissions, Practices and user education. 5.4 External Threats – Front Door threats, Back Door threats, Denial services threats, iruses, worms and other malicious codes.	3	--

LIST OF EXPERIMENTS:

Any 12 (Twelve) laboratory experiments and/or assignments from following list:

1) Study of Network Administration.
2) Identifying and recognizing network components.

3) Installing Windows 2003 Server.
4) Installing Windows XP Professional within Windows 2003 domain.
5) Study and Installing Active Directory.
6) Creating Active Directory Objects.
7) Setting up Local Print Device.
8) Installing and Configuring a Network – Capable Print Device.
9) Create new Users & give the Permission.
10) LAN Configuration.
11) Installation of IIS server.
12) Installing and Configuring DHCP Server.
13) Understanding the installation of DNS.
14) To study of installation of Red Hat Linux operating systems.
15) Introduction to Linux Administration.
16) Linux system administration such as

    Managing file system, Disk management utilities, mounts, umount, df, du, fdisk, su, useradd etc.
17) Linux DHCP Server Configuration.
18) Installation and configuration Samba server.
19) Configuration of FTP Services/Mail Services/Web Server.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience

ORAL EXAMINATION:

Oral examination will be based on the term work submitted by the student and the theory of the subject.

TEXT BOOKS

S.No.	Name of Book	Author	Publication
1	The Complete Reference Networking	Craig Zacker	Tata McGraw-Hill Edition
2	Networking A Beginner's Guide	Bruce Hallberg	Tata McGraw-Hill Edition
3	Introduction to Networking	Richard A. McMohan,Sir	Tata McGraw-Hill Edition
4	Networking + Certification Training Kit	--	Microsoft Press
5	MCSE Training Kit Networking Essential Plus	--	Microsoft Press
6	Linux Lab: Hands on Linux	Dayanand Ambawade and Deven N.Shah	Wiley Dreamtch Pvt. Ltd
7	Red Hat Linux Networking and System Administration	Terry Collings and Kurt wall	Red Hat Press

COURSE CODE: 5S410 COURSE NAME – PROJECT

Teaching Scheme		Evaluation Scheme						
TH	--		PT	TEE	TW	PR	OR	Total
PR	4	Max.Marks	--	--	100	--	50	150
TOTAL	4	Duration	--	--				

RATIONAL:

Project work is the important aspect of any curriculum. Here the students has unlimited scope to integrate his knowledge and skills that he acquired during his three years Diploma. He can develop computerized system or solutions to assigned problems. He is accepted to observe all-important steps of software development cycle. He is also encouraged to take industry based real life problems and develop a solution for the same.

COMPETENCY STATEMENT (S):

1. Student wills able to deliver a seminar using advanced seminar tools such as audio, video, multimedia presentations, learning materials, and OHP slides.
2. Student will develop communication, presentation stage courage skills.
3. Student will identify and analyze real life problems based on S/W , H/W, S/W & H/W and multidisciplinary project.
4. Student will able to write system documentation, select a topic, submit the abstract of the topic, Collect information regarding the project, Identify the data structures to be used to implement the project, Identify the hardware & software requirements to implement, Design the Data flow diagrams & flow charts
5. Prepare a project.
6. Student will develop Software, Software + Hardware projects

COURSE OBJECTIVES: Students will be able to

1. Integrate the knowledge and skills acquired in the past two years of the diploma and Third year of Diploma.
2. Develop a computerize system for real life problems.
3. Take challenges from industries / software firms and developed a solution for it.
4. Develop a project by integrating theory and practical.

COURSE CONTENTS:-

Sr. No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**MINIMUM ELIGIBILITY FOR REGISTERING A PROJECT:** Student must have obtained 110 credits before registering a project course		
2	**GUIDELINES FOR PROJECT WORK** This project title should be taken from the polytechnic or industry situations **Project Development Approach:** **Project Selection** i) Project must be based on knowledge acquired within three years of Diploma. Students must be aware with languages, packages hardware, he/ she is using in his/her project. If a		

particular language/package is not in curriculum student must posses a certificate course completed in that language/package from a Registered Institute. Copy of the certificate should be attached in the project report.

ii) Repetition of project should be avoided as far as possible.

iii) Project selection must be completed during the fifth semester. At the end of 5th semester student must submit a synopsis (3-4 page document) giving details about system design making clear views about project. And feasibility study report.

iv) Feasibility study should includes:
a. Time feasibility.
b. Software, Hardware required.
c. Sufficient information source
d. Cost effectiveness, etc.

v) A group of maximum 4 students can develop a project,

vi) Project may be:
a. Application Oriented
b. System Software.
c. Hardware/software based

vii) Start of sixth semester/during registration of project will be deadline for Project selection.

Project Design

This is Second phase in which students will actually start collecting detail information about their project. That is project selection formalities must be completed before registering for project course.

1. Group must visit concern persons in the field to collect the system requirement. A practical design and development is to be achieved.
2. They must adopt standard procedures, rules, regulation used in the real system and no imaginary model should be developed.
3. Group can collect information about any other package, software currently under development on same subject or already developed and group should study what facilities the available software provide and what are its drawbacks.
4. If any such software is implemented/installed at some industry students must visit and collect on site information.
5. Taking into consideration all requirements, design total system in top down fashion.
6. Design must be modular and there must be clear distribution of task among group members.

3	**PROJECT DEVELOPMENT** **In Third Phase students are expected to utilise there time for actual coding, testing, of project.** 1. Independent module development is necessary. 2. Enough time must be provided in time-table for project development 3. There must be continuous assessment of project development. 4. Prototype model may be developed and tested. 5. Taking into consideration shortcoming and suggestions final Software/Hardware should be developed by the end of sixth semester **Project Report Must Include:** 1. Title page of the project 2. Acknowledgement Page 3. Certificate page of college (certificate must be included for a project if it is a sponsored project form industry or organization) 4. Abstract of the project (One Page) 5. Introduction of Project (two to three pages) 6. Feasibility analysis of Project (as per point no. 4 in Project selection). 7. Scope of the project 8. Project design. 9. Algorithms. 10. DFDs /E-R Diagrams/Flowchart, wherever applicable. 11. User manual 12. Limitations/Future development. 13. Costing. 14. Bibliography. 15. Project source code with entire set of accessories such as database, drivers etc. in form of CD. 16. Data sheets of only uncommon, (main Integrated Circuits) Main I/C e.g. Speech synthesiser IC and not of common I/C like 8085. There is no need of any explanation of common I/C and their interfacing. **Project Valuation Marks Distribution: -** 1. Innovative idea 15% 2. Project Design 15% 3. Seminar 15% 4. Working Model 15% 5. Continuous Assessment 40% 6. Oral Examination Oral of project 50Marks This document should be included in the syllabus and be available in library for reference to students at the start of academic year.		

4	**IMPLEMENTATION** The teachers are expected to motivate the student to take innovative project either from the polytechnic system or from the industry. **GUIDELINES:** 1. Head of respective department is expected to assign the project guides to all the students by issuing formal office order to the staff members and notifying the same to the students. 2. Normally maximum 4 projects should be assigned to the teacher as a project guide. 3. Maximum eligible staff members from the department should be assigned duty of project guide. It is not necessary that the staff teaching to third year only should be given the duty of project guide. 4. The respective project guides should carry out weekly progressive assessment. 5. Authenticated assessment record should be kept in the form of registers and should be produce at the time of project examination. 6. 40% weight age is to be given for continuous assessment of the project. 7. Students are expected to deliver a seminar in the first month of 6th Term based on project, which should have a weightage of 15%. The institute should provide facility for CD-writing in the institute computer labs for copying final project report for department and library reference.		

Course Code: 5T411 **Course Name: Seminar**

Teaching Scheme		Evaluation Scheme						
TH	--		PT	TEE	TW	PR	OR	Total
PR	**02**	Max.Marks	--	--	**50**	--	**50**	**100**
TOTAL	**02**	Duration	--	--	--	--	--	--

RATIONALE:

Seminar is the important aspect of any curriculum. Here the students has unlimited scope to integrate his knowledge and skills. This course is essential to understand the recent developments and latest trends in the field. This will help the students to acquire the skill like mining for information, analysis, communication, presentation skills etc.

For effective presentation student must have good communication skill. With a given time limit student should be able to express his ideas and concepts, thoroughly in front of faculty members and other students, student should be able satisfy the queries raised by them as well as student should learn to take any feedback positively.

COMPETENCY STATEMENTS:

1. Acquire information from different sources.
2. Interact with peers to share thoughts and views.
3. Identify and analyze acquired information
4. Arrange analyzed information in different & appropriate chapters of report.
5. Prepare a type written seminar report in prescribed format.
6. Present given topic in a seminar using advanced presentation tools such as audio, video, multimedia etc.
7. Develop communication skills, presentation skills and stage courage.
8. Develop habit of patient & empathetic listening, questioning and giving feedback.
9. Student will be exposed to new technologies, researches, products, algorithms, protocols etc.

OBJECTIVE :

Student will be able to

1. Acquire up to date information about latest technological advancements and recent trends in Information Technology world from different resources. (resources can be standard journals, technical magazines, industrial visits, feedback of experts from industry, technical papers, proceedings of international / national technical conferences/ symposiums, books, blogs, Internet etc)
2. Analyze & take feedback through technical discussions with peers.
3. Arrange acquired information in logical sequence. (arrangement should be an attempt to throw light on new topic from its introduction to the proper technical details along with its applications, advantages, future scope etc.)
4. Write seminar report as per the prescribed format.
5. Present the seminar topic using advanced presentation tools effectively.
6. Develop communication and presentation skills.
7. Learn to take any feedback positively

COURSE CONTENTS:-

Sr. No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
01	**GUIDELINES FOR STUDENTS** 1. Each student should submit a topic in the area of Information Technology preferably keeping track with recent technological developments and trends in the field or any research theme. 2. Seminar topic should not be a part of any course which student has already studied or will study in final semester of diploma. Also topic should not be repeated in last three batches. 3. No two students are allowed to take same topic. Also contents of seminar of no two students should match more than 30%. 4. A panel of faculty members will finalize the topic for each student and student should not change it. 5. Each student should prepare seminar report containing at least 35 pages as per the format prescribed by department. Student should submit the seminar report in the form of spiral bound journal duly signed by the Guide, Head of Department and Principal. 6. Each student will prepare a seminar presentation in the term making use of audio/visual aids 7. for a duration of 10-15 minutes and deliver it on the assigned date only. Every student is required to give presentation independently. 8. All students must attend seminars and it is expected that they should listen it carefully and take part in questioning actively. 9. A panel of faculty members along with guide will assess the seminar internally during the presentation. Faculty members should ask questions.		
02	**GUIDELINES FOR ASSESSING A SEMINAR** Seminar should be assessed on following basis 1. Topic selected by student 2. Information collection. 3. Contents of seminar 4. Use of Multimedia in presentation 5. Actual delivery of a seminar (Communication skills, stage courage, confidence, positive thinking etc) 6. Response to questions of students and faculty members 7. Seminar report		

Course Code: 5T412 **Course Name: Open Source Software Technologies Laboratory**

Teaching Scheme		Evaluation Scheme						
TH	--		PT	TEE	TW	PR	OR	Total
PR	**04**	Max.Marks	--	--	**50**	**50**	--	**100**
TOTAL	**04**	Duration	--	--	--	**04 Hours**	--	--

RATIONALE:

This subject is a step to expose the students towards open source technologies. Linux is a very good example of open source software. Though Linux is prime focus students should be able to use and develop small web based application / Software using Open Source Technologies.

COMPETENCY STATEMENTS:

Students will be introduced to the large platform of open source softwares

1. Introduction to the new concept of open source software
2. Understand & install Linux O.S.
3. Be conversant with vi editor
4. Perform programs using shell scripts
5. Develop web based application using LAMP

OBJECTIVE :

Students will be able to

1. understand open source movement worldwide
2. use the fastest growing open source operating system, "Linux"
3. effectively install, use and perform basic configuration of Linux operating system
4. understand & use vi editor
5. perform shell script programming
6. develop application using LAMP

Suggestive List of Experiments: (Any twelve experiments / assignments from the following)

1. Installation of Linux
2. Practice of Linux basic commands
3. Practice of Linux commands for working with files & directories
4. Practice of Linux commands for user & group management
5. Practice of Linux commands for text processing tools like grep, cut etc.
6. Practice of Linux commands for communication.
7. Practice & study of vi editor
8. Write a Shell script to print the command line arguments in reverse order.
9. Write a Shell script to check whether the given string/ number is palindrome or not.
10. Write a Shell script to sort the given array elements in ascending order using bubble sort.
11. Installation using RPM
12. Download and Installation of LAMP (Linux Apache My SQL PHP) Packages.
13. Introduction & configuration of PHP, MYSQL and APACHE server
14. PHP script for sorting the marks
15. Introduction & using MySQL for DBMS operations
16. Storing and retrieving data in PHP
17. PHP GET and POST functions.
18. Develop web application that can insert, delete and modify information of database using PHP & MySQL

COURSE CONTENTS:-

Sr. No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
01	**Open Source and Linux** Open Source Definition, The distribution terms of open source software, open source technology, importance Free and open Source Software (FOSS), LAMP(Linux, Apache, MySQL, PHP) Usage Basics: Logging into the system, changing users and editing text files, Running Commands and Getting Help, Browsing the File system, Users, Groups and Permissions, Introduction & working vi editor, Install, update, and remove software packages with RPM, Accessing and Running Applications: cc compiler, gcc Compiler,	--	--
02	**Shell Programming** Introduction to Korn shell, Bourne shell, Cshell and their functionality, Meta characters, redirection, file name substitution, pipes, common Built in Commands like Eval, Execc, Umask, etc. and shell programming in context of any of three shelles.	--	--
03	**Apache and PHP** Introduction to Web server. Installing Apache on Linux: httpd service. PHP : Testing Installation. Basics of PHP scripts, Variables, Data types, Operators and Expressions, Constants, Flow control functions, If statement, Loops, Arrays, Strings, Dates and Times, Forms.	--	--
04	**MySQL Server and Application** MySQL Server: Configuring MySQL Server, working with MySQL Databases, MySQL Tables, SQL Standards-INSERT, SELECT, UPDATE, REPLACE, DELETE. Date and Time functions in MySQL. PHP-MySQL Application Development: Connecting to MySQL with PHP, Inserting data with PHP, Retrieving data with PHP. Developing PHP scripts for dyanamic web page like Feedback form, online admission form online test.	--	--

TEXT BOOKS

S.No.	Name of Book	Author	Publication
01	Red Hat Linux Bible	Christopher Negus	Wiley Publishing
02	PHP, MySQL and Apache	Julie C Meloni	Pearson Education
03	The Complete Reference Linux	Peterson	Tata McGRAW HILL

INTERNET RESOURCES:

1. http://www.opensource.org
2. http://www.linux.org/lessons
3. http://www.php.net

CT 31/10/12 DC HOD CDIC

Course Code: 5T413 Course Name: Computer Security and Cyber Laws

Teaching Scheme		Evaluation Scheme						
TII	04		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	---	25	150
TOTAL	06	Duration	1.00	3.00	--	--	--	--

RATIONALE:

Computer security, one of the most important and relevant area of computing today. The requirement to address security in computer system design is an important design consideration in many of today's systems. It is essential to understand various threats to secure computing and the basic security design principles and techniques developed to address these threats. The student will achieve a firm intuition about what computer security means, be able to recognize potential threats to confidentiality, integrity and availability. This course will introduce basic cryptography, fundamentals of computer/network security, risks faced by computers and networks, security mechanisms, operating system security, secure systems design principles, and network security principles. It will develop knowledge for security of information and information systems within organizations. It focuses on concepts and methods associated with planning, managing, and auditing security at all levels including networks

COMPETENCY STATEMENTS:

Students will learn operation of different mobile technologies.

Understand mobile communication systems.

OBJECTIVES:

The students will be able to:

1. Understand the risks faced by Computer Systems and the nature of common Information hazards.
2. Identify the potential threats to confidentiality, integrity and availability of Computer Systems.
3. Understand the working of standard security mechanisms.
4. Use cryptography algorithms and protocols to achieve Computer Security.
5. Understand the threats and security mechanisms for Computer Networks.
6. Build systems that are more secure against attacks.
7. Apply security principles to secure Operating Systems and applications.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Introduction and Security trends** 1.1 Threats to security: Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare 1.2 Avenues of attack, steps in attack 1.3 Types of attack: Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hacking, encryption attacks. Malware: Viruses, Logic bombs 1.4 Security Basics – Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security 1.5 Access control: Discretionary, Mandatory, Role based Authentication: Certificates Tokens, Multifactor	8	10
2	**Organizational/ Operational security** 2.1 Role of people in security : Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software / hardware, Access by non employees, Security awareness, Individual user responsibilities 2.2 Security policies, standards, procedures and guidelines 2.3 Physical security : Access controls Biometrics : finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes, Physical barriers 2.4 Social Engineering	8	10
3	**Cryptography and Public key Infrastructure** 3.1 Encryption algorithm/Cifer, Caesar's cipher, shift cipher, substitution software, Vigenere cipher 3.2 Transposition techniques, Steganography 3.3 Hashing, SHA 3.4 Symmetric encryption, DES (Data encryption standard), Asymmetric encryption, Digital signatures, Key escrow 3.5 Public key infrastructures : basics, digital certificates, certificate authorities, registration authorities, steps for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate 3.6 Centralized or decentralized infrastructure, private key	10	12

	protection 3.7 Trust models : Hierarchical, peer to peer, hybrid		
4	**Network security** 4.1 Firewalls : working, design principles, trusted systems, Kerberos 4.2 Security topologies – security zones, DMS, Internet, Intranet, VLAN, security implication, tunneling 4.3 IP security : overview, architecture, IPSec, IPSec configurations, IPSec security 4.4 Virtual Private Network 4.5 Email security: security of email transmission, malicious code, spam, mail encryption	8	10
5	**System security** 5.1 Intruders, Intrusion detection systems (IDS), host based IDS, network based IDS 5.2 Password Management, vulnerability of password, password selection strategies, components of a good password 5.3 Operating system security: Operating system hardening, general steps for securing windows operating system, Hardening Unix/Linux based operating system, updates: hotfix, patch, service pack	8	10
6	**Application and web security** 6.1 Application hardening, application patches, web servers, active directory 6.2 Web security threats, web traffic security approaches, secure socket layer and transport layer security, secure electronic transaction Software development : secure code techniques, buffer overflows, code injection, least privilege, good practices, requirements, testing	6	8
7	**Intellectual property issues in cyberspace** 7.1 Introduction to intellectual property Protections via Trade Secrets, Trademarks, Patents, Etc. 7.2 copyright on web-content, copyright on software	8	10
8	**Information technology Act 2000** 8.1 Scope, jurisdiction, offense and contraventions	8	10

LIST OF EXPERIMENTS:

Any 10 (Ten) assignments from following list :

1. Study of security threats.
2. Study of different methods of user authentication including password & biometrics.
3. Study of security provided by social networking websites.
4. Study of security provided by different operating systems
5. Study of different encryption algorithms.
6. Study of detail procedure of authentication & verification of digital certificate.
7. Study of different firewalls.
8. Study of Security provided by IPV4 / IPV6
9. Study of email security.
10. Study of Intrusion detection systems.
11. Study of IPR, Trademarks and copy rights.
12. Study of IT act 2000

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:

Oral examination will be based on the term work submitted by the student and the theory of the subject.

TEXT BOOKS

S.No.	Name of Book	Author	Publication
1	Principles of Computer Security Security + and Beyond	Wm. Arthur Conkin, Dwayne Williams,Gregory B. White, Roger L. Davis, Chuck Cothren	Mc Graw Hill Technology Education International Edition 2005
2	Computer Security	Dieter Gollman	Wiley India Education, Second Edition
3	Computer Security Basics	Deborah Russell, G.T.Gangenisr	O'Reilly publication
4	Cryptography and Network Security Principles and Practices	William Stallings	Pearson Education, Third Edition
5	Cryptography and Network Security	Atul Kahate	Tata-McGraw-Hill Sixth reprint 2006

Course Code: 5T414 **Course Name: Data Warehousing & Mining**

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	05	Duration	1 Hr	3 Hrs				

RATIONALE:

Organizations are today suffering from a malaise of data overflow. The developments in the transaction processing technology has given rise to a situation where the amount and rate of data capture is very high, but the processing of this data into information that can be utilized for decision making, is not developing at the same pace. Data warehousing and data mining (both data & text) provide a technology that enables the decision-maker in the corporate sector/govt. to process this huge amount of data in a reasonable amount of time, to extract intelligence/knowledge in a near real time.

The data warehouse allows the storage of data in a format that facilitates its access, but if the tools for deriving information and/or knowledge and presenting them in a format that is useful for decision making are not provided the whole rationale for the existence of the warehouse disappears. Various technologies for extracting new insight from the data warehouse have come up which we classify loosely as "Data Mining Techniques".

COMPETENCY STATEMENT:

1. To help IT managers, system administrators, DBA's, Network & Communication specialists, & application developers to make informed decisions when selecting platforms & products to implement a data warehouse or a data mart.
2. To generate the hypothesis about a relationship & verify it with a series of queries against the data.

OBJECTIVES:

Students will be able to

1. Familiarize with the fundamental concepts of Data warehousing and OLAP
2. Develop the concepts of data mining methods in database management skills
3. Efficiently design and manage data storages using data warehousing, OLAP, and data mining techniques.
4. Use the concepts in Text mining, web mining and Knowledge Discovery.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Introduction to Data Warehousing** 1.1 Introduction to Decision Support System: DSS Defined, History of DSS, Ingredients of DSS, DSS Knowledge base, 1.2 User Interfaces, 1.3 The DSS Users, 1.4 Categories and Classes of DSSs 1.5 Need for data warehousing, 1.6 Operational & informational data, **1.7** Data Warehouse definition and characteristics.	10	16

2	**Data Warehouse Components** a. Overall Architecture **b.** Data warehouse database, **c.** Sourcing, acquisition, cleanup, and transformation tools, 2.4 Metadata, 2.5 Data Marts, 2.6 Data warehouse administration and management, 2.7 Information delivery system.	08	16
3	**OLAP in the Data Warehouse** 3.1 A Multidimensional Data Model, 3.2 Schemas for Multidimensional Databases: Stars, Snowflakes, Star join and Fact Constellations Measures, 3.3 Concept Hierarchies, OLAP Operations in the 3.4 Multidimensional Data Model 3.5 Need for OLAP, OLAP tools, 3.6 Mining Multimedia Databases, 3.7 Mining Text Databases, 3.8 Mining the World Wide Web, Multidimensional Vs Multirelational OLAP.	08	14
4	**Data Mining Algorithms** a. Concept Description: What is Concept Description?] b. Data Generalization and Summarization Based Characterization, c. Mining Association Rules: Association Rule Mining, Market Basket Analysis, Association Rule classification, 4.4 The Apriori Algorithm, 4.5 Mining Multilevel Association Rules, 4.6 Constraint Based Association Mining, Sequential mining. 4.7 Classification and Prediction: What is Classification and Prediction? Data Classification Process, 4.8 Issues regarding Classification and Prediction, 4.9 Classification by Decision Tree Induction, Bayesian Classification,	10	18
5	**Classification, Knowledge Discovery** 5.1 Classification Based on Association Rule Mining, Other Classification Methods Cluster 5.2 Analysis: What is Cluster Analysis? Types of Data in Cluster Analysis, 5.3 A Categorization of Clustering Methods. 5.4 Introduction to Knowledge Discovery, innovative techniques for knowledge discovery, 5.5 Application of those techniques to practical tasks in areas such as fraud detection, scientific data analysis, and web mining.	12	16

LIST OF EXPERIMENTS:

1. Evolution of data management technologies, Introduction to data warehousing concepts.
2. Study of design of fact and Dimension tables, data marts.
3. Study of OLAP, Rollup, Drilldown, Slice, and Dice operations.
4. Study of multidimensional data.
5. Study of data generalization and summarization techniques.

6. Study of Introduction to Data Mining Techniques.
7. Study of Decision Tree algorithm.
8. Study of Naïve Bayesian classifier.
9. Study of Association Rule Classification.
10. Study of object oriented databases.

TERMWORK:

Student should submit a term work in the form of journal containing experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:

The oral examination will be based on the above mentioned assignments. Questions will be asked during the oral examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

TEXT BOOKS

S.No.	Name of Book	Author	Publication
1	Data Warehousing Fundamentals	Paul Punnian	
2	Data Mining Concepts and Techniques	Han, Kamber	TMH
3	Data Warehousing, Data Mining and OLAP	Alex Berson	
4	Data Mining: Concepts and Techniques	Margaret Dunham	

Course Code: 5T415 **Course Name: COMPUTER GRAPHICS**

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	05	Duration	01 Hr	3 Hrs				

RATIONALE:

The computer is an information-processing machine. Almost every computer system is set up to allow the user to interact with the system through a graphical user interface, where information on the display screen is conveyed in both textual and graphical forms. Everyone should be aware of this rapidly expanding technology. Computer graphics is a complex and diversified technology. The output product of Computer graphics is a pictorial image. Hence the computer has become a new tool for the artist and animator. Computer graphics is an extremely effective medium for communication between man and machine through pictures, charts and diagrams. Thus one can understand the information contents of a displayed diagram or perspective view much faster than the table of numbers.

COMPETENCY STATEMENTS:

Use of basic facts, rules, identities to solve drawing, business graphs, architectural design problems.

OBJECTIVE

- What is Computer Graphics?
  - Applications Areas
  - History
  - Image formation
- - Basic Architecture.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**BASICS OF CG** 1.1 Display devices, 1.2 Primitive operations, 1.3 The Display-file Interpreter, 1.4 Display file structure, 1.5 Graphics file formats, 1.6 Text mode graphics function, 1.7 Graphic mode, and Graphics functions 1.8 Shapes, colors, Co-ordinate systems, Applications of computer Graphics	08	12
2	**Line, circle, and polygon** 2.1 Basic concepts in line drawing, 2.2 Line drawing algorithms: DDA algorithms, Bresenham.s algorithm, 2.3 Circle generating algorithms: DDA circle drawing algorithm, Bresenham.s circle drawing algorithm, midpoint circle algorithm,	12	18

	2.4 Polygons. Types of polygons, Polygon representation, Entering polygons, polygon filling: Flood fill, scan-line algor ithm.		
3	**Transformations** 3.1 Principles of Transformations, 2D transformation: scaling, Reflection, shearing, Rotation, 3.2 Translation, Rotation about an arbitrary point, 3.3 D Transformation: scaling, 3.4 Rotation, translation, rotation about arbitrary axis	10	18
4	**Windowing & Clipping** 4.1 Viewing transformation, 4.2Normalization transformation, 4.3 Line clipping: Cohen-Sutherland, 4.4 Line clipping algorithm, 4.5 Midpoint subdivision algorithm, 4.6 Polygon clipping: Sutherland Hodgeman Polygon clipping algorithm.	10	16
5	**Curves, Raster graphics & Interactive graphics** 5.1 Curve generation: arc generation using DDA algorithm, 5.2 Characteristics of B-Spline, Bezier curves, 5.3 Characteristics of Raster scan display, 5.4 Characteristics of Random scans display, 5.5 Need for graphics standards, 5.6 Advantages of Graphics standards	08	16

LIST OF EXPERIMENTS: (minimum 10 experiments)

1. Study of graphics Functions Plotting of Pixels Drawing Lines, Shapes, applying Colors.
2. Implementation of DDA algorithm for line drawing.
3. Program to Draw a Line using Bresennham.s algorithm.
4. Implementation of DDA algorithm for drawing Circle.
5. Implementation of Bresenham.s algorithm for drawing Circle.
6. Implementation of Scan conversion algorithm
7. Program for 2-D transformations -> Translation
8. Write Program for 2-D Transformations -> Scaling, Rotation,
9. Write Program for 2 D transformations shearing and Translation program
10. Write program for rotation about an arbitrary point.
11. Study of Cohen- Sutherland algorithm for line clipping.
12. Implementation of midpoint subdivision algorithm
13. Study of Sutherland- Hodgeman algorithm for polygon clipping.

TERMWORK:

Student should submit a term work in the form of journal containing at least 10 (Ten) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-
30% weightage will be for Regular Attendance, Punctuality.

CT DC HOD CDIC

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:

The oral examination will be based on the above mentioned assignments. Questions will be asked during the oral examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

TEXT BOOKS

S.No.	Name of Book	Author	Publication
01	Mathematical elements for Computer Graphics.	David F.Rogers..	
02	Procedural Elements for Computer Graphics.	David F.Rogers.	
03	Principles of Interactive Computer Graphics	Newman and Sproull	Tata McGraw Hill

2) References :

www.insidecg.com
www.graphics.standard.edu
www.cmp.uea.ac.uk/research
www.computerarts.co.uk

COURSE CODE: 5T416 COURSE NAME: BIO-INFORMATICS

Teaching Scheme		Evaluation Scheme						
TH	3		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25	--	150
TOTAL	05	Duration	1	3	--	2	--	--

RATIONALE:

In the advanced world of IT, biology & IT has come together and formed new technology of bioinformatics. It is essential in the advanced era of for the database designing, data & computer security.

COMPETENCY STATEMENT (S):

1. Students will understand the application of bioinformatics.

COURSE OBJECTIVES:

The student will be able to:

- To learn and understand the scope of Bioinformatics
- To learn and use tools used for this domain
- To learn the application domain of Bioinformatics

COURSE CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1	**Introduction: Biology in the computer age** 1.1 computing changes in biology, Bioinformatics just about building database, 1.2 Meaning of informatics to biologists, challenges offered by biology to computer scientists, skills required for this field, 1.3 Available information & software for this domain, use web information, 1.4 understand sequence alignment data, writing programs to align two biological sequences, predict protein structure from sequence, 1.5 Watson's Definition, Information Flow, Human Genome project.	08	14
2	**Tools for Bioinformatics:** 2.1 Biological Research on the web, Using search engines, finding scientific articles. 2.2 Public biological databases, Searching biological databases, Depositing data into the public databases, 2.3 finding software, Judging the quality of information 2.4 Sequence Analysis, Pairwise alignment& Database searching: Chemical composition of biomolecules, 2.5 Composition of DNA & RNA, Watson & Crick Solve structure of DNA, Development of DNA sequencing	12	20

	methods, 2.6 Gene finders & feature detection in DNA, DNA translation, Pair wise sequence comparison, 2.7 Sequence queries against biological databases, Multifunctional tools for sequence analysis.		
3	**Multiple sequence Alignments, Trees & profiles:** 3.1 The morphological to the molecular, Multiple sequence alignment, Phylogenic analysis, Profiles & motifs. 3.2 Predicting protein structure & function from sequence: Determining the structure of the proteins, Prediction the structure of proteins, from 3D to 1D, 3.2 Feature detection in protein sequences, Secondary structure prediction, Predicting 3D structure.	08	14
4	**Tools for Genomic & Proteomics:** 4.1 From sequencing genes to sequencing genomes, 4.2 Sequence assembly, Accessing genome information on the web, 4.3 Annotating and analyzing whole genome sequences, 4.4 Functional genomics new data analysis challenges, Proteomics, 4.5 Biochemical pathway databases, Modeling kinetics & physiology 4.6 Visualization and Data Mining: Preparing your data, Viewing graphics, Sequence data visualization, 4.7 Networks and pathway visualization, working with numerical data, Visualization: summary, Data mining & biological information	12	20
5	**Building a sequence search protocol** 5.1 Introduction, A practical approach, when to believe a result, Structural and Functional interpretation. 5.2 Analysis packages: Introduction What is in analysis package? 5.3 Commercial Databases Comprehensive packages, Packages specializing in DNA analysis. Intranet packages, Internet packages, web addresses.	08	12

Practical Examination:

The term work shall consist of at least 10 experiments/ assignments based on the above syllabus.

TERMWORK:

Student should submit a term work in the form of journal containing above assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

In practical hours teacher should clear all the theoretical and practical features of student of respective practical. Lecturer should demonstrate the idea by taking example and demonstrate the key concepts in each practical assignment.

Grade / Marks will be given by respective subject teacher & will be evaluated as follows:-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:
The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.
Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	Cynthia Gibas & Per Jambeck	Developing Bioinformatics computer skills	O'REILLY
02	T K Attwood D J ParrySmith	Introduction to Bioinformatics	Pearson Education
03	Bryan Bergeron M.D	Bioinformatics Computing	PrenticeHall of India

Course Code: 5T417 **Course Name: Human Computer Interface**

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	25	--	150
TOTAL	05	Duration	1	3	--	02	--	--

RATIONALE:

The computer is an information-processing machine. Almost every computer system is set up to allow the user to interact with the system through a graphical user interface, where information on the display screen is conveyed to both human and computer. Everyone should be aware of this rapidly expanding technology. Human Computer interface is a complex and diversified concept. It helps to improve the usability of interactive system. This gives different interactive styles to interact with computer by human .

COMPETENCY STATEMENT:

To develop GUI Objects to know interface between computer and human.

OBJECTIVE:

1. To know user interface design usability
2. To study design principle for designing GUI object.
3. To develop presentation methods.
4. To manage design process testing

Course Contents:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1	**Overview of HCI, Theories and Principles** 1.1 Introduction, Goals of System Engineering, 1.2 Goals of User-Interface Design Usability of Interactive systems, 1.3 Motivations for Human Factors in Design, Guidelines, Principles, Theories, 1.4 Conceptual, Semantic, Syntactic and Lexical Model, GOMS and the Keystroke-level Model, Object-Action Interface Model	06	10
2	**Managing Design Processes and Tools and Testing** 2.1 Three pillars of Design, Development Methodologies, Ethnographic Observation, 2.2 Participatory Design, Scenario Development, Expert Reviews, 2.3 Usability Testing and Laboratories, Acceptance Tests, Evaluation during active use, 2.4 Specification Methods, Interface Building Tools, and Evaluation Tools	08	14
3	**Design Principles for Designing GUI Object (H-10, M-15)** 3.1 Direct manipulation (examples, explanations), Visual Thinking and Icons, 3.2 3D Interfaces, Virtual Reality, Introduction to Menu Selection, 3.3 Form Fill-in, and Dialog Boxes, Task Related Organizations, Fast Movement through Menus, Item Presentation Sequence, Response Time and Display Rate, Data Entry with Menus, Menu Layout, 3.4 Command-Organizational Strategies, Naming and Abbreviations, Command Menus, Natural Language in Computing	10	14

4	**Interaction Styles** 4.1 Introduction to Interaction Devices, Keyboards and Function Keys, 4.2 Pointing devices, Speech and Auditory Interfaces, Speech Recognition, 4.3 Image and video displays, Printers, Response time and display rate with respect to display, 4.4 Goals of Collaboration, Asynchronous and Synchronous Interfaces, Face-to-Face Interfaces	**08**	**14**
5	**Presentation Design Issues** 5.1 Error Messages, Display Design, Individual-Window Design, Multiple Window Design, 5.2 Co-ordination by Tightly-coupled Windows, Color, Printed Versus Online Manuals, 5.3 Preparation of Online facilities, Online Tutorials, Online Communities for User Assistance	**08**	**13**
6	**Information Search and visualization** 6.1 Introduction, Search in Textual Documents and Database Querying, 6.2 Multimedia Document Searches, Advanced Filtering and Search Interfaces 6.3 Information Visualization, OAI Model for Website Design	**08**	**14**

List of Experiments:

1. Develop a single document interface like Notepad.
2. Develop an application like media player to play audio and video files with playback controls.
3. Develop a calculator with an option between Normal and Scientific calculator.
4. Create a website of online shopping (which includes a list of items to be purchased with details like cost, description, availability, payment type, vendor□s address, customer□s address)
5. Develop an application like MS paint & include features like undo, colors, fonts, drawing tool bar, shapes, brushes
6. Develop an application for spell checking by maintaining a database of all dictionary words and should show the possible words
7. Develop an application for Digital Diary
   a. Enter daily reports of your activities.
   b. Enter reports for past or future dates.
   c. Protect your diary with a password.
8. Create a GUI of online admission system.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:
The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

Text Books:
1. Ben Shneiderman, "Designing the User Interface", 4th Edition, Pearson Education,

2008, ISBN 81-7808-262-4
2. Alan Dix, Janet Finlay, Gregory Abowd, and Russell Beale," *Human-Computer Interaction*," Prentice Hall

Course Code: 5T501 Course Name: Multimedia & Animation Techniques

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	25	--	150
TOTAL	05	Duration	1.00	3.00	--	--	--	--

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, and 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.

COMPETENCY STATEMENTS:

1) Student will create multimedia presentations and applications.
2) Student will create multimedia animations.
3) Handle different type of media files and their interconversion.

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

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic	Hours	Marks
1	**Multimedia Elements Multimedia Application** 1.1 I/P, O/P devices, 1.2 Evaluation of Multimedia systems 1.3 Storage media	5	10
2	**Architecture & Issues For Distributed Multimedia System** 2.1 Multimedia System Architecture. 2.2 Distributed Multimedia. 2.3 Synchronization, Orchestration & QOS Architecture 2.4 Framework for Multimedia System.	6	10
3	**Compression/Decompression & File Formats** 3.1 Need	14	18

	3.2 Types 3.3 Evaluating & Visibility 3.4Video Compression Technique 3.5 Introduction to Standardization of Algorithm 3.6 File Formats 3.7 History of RIF, TIFF 3.8 Introduction to RIFF, AVI 3.9 JPEG-objectives, Architecture, JPEG-DCT encoding Quantization. 3.10 JPEG-stastical coding, predictive lossless coding, JPEG performance 3.11 MPEG-objectives, Architecture, BIT stream syntax performance 3.12 MPEG2 & MPEG4		
4	**Multimedia Authoring And User Interface** 4.1 Multi Media Authoring System and its type 4.2 Hypermedia Application Design consideration 4.3 User Interface Design 4.4 Information Access 4.5 Object Display / Playback Issues	6	14
5	**Distributed Multimedia Systems** 5.1 Components of Distributed Multimedia Systems 5.2 Distributed Client Server Operation 5.3 Multimedia Object Server 5.4 Multi Server Network topologies 5.5. Distributed Multimedia Databases	8	14
6	**Multimedia Tool** 6.1 Introduction to Multimedia tool – Flash 6.2 Creating & Modifying elements 6.3 Line tool, fill/attributes, different shapes, text tools & pen tool 6.4 Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basic editing tools, selecting & deselecting elements, modifying created objects.	9	14

LIST OF EXPERIMENTS:

Any 10 (Ten) laboratory experiments and/or assignments from following list :

1. Study of multimedia devices and their interfacing.
2. Study Of flash.
3. Study of 3D-MAX or MAYA software.
4. Create a cycle & name each part of cycle using different styles & format & animate text.
5. Draw seed & create small plant with use of at least 4 frames.
6. Create a forest of tree with flowers & fruits from a small plant using different layers & frame transition time.
7. Create a forest of trees using the object created earlier. Also add lighting and rain effect.
8. Insert audio to relevant frames that has lighting & rain effect.
9. Convert created work into file format which can be publish on web.
10. Interfacing digital-web-cam, capturing live image & editing using web-cam software.
11. Importing & exporting images, apply different image editing tools.

12. Mini Project: Students should create a movie of minimum 2 minutes playtime using either Flash or 3D-MAX or MAYA software

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

TEXT BOOKS

S.No.	Name of Book	Author	Publication
1	Multimedia Systems Design	Prabhat k. Andheigh, Kiran Thakrar, John F	Prentice Hall of India.
2	Multimedia Systems	Koegel Buford	Pearson Education
3	Micromedia Flash for Windows and Macintosh	Katherine Ulrich	Pearson Education
4	Multimedia Communication	Free Halshall	Pearson Education
5	Multimedia Computing, Communication and Application	R. Steimnetz, K.Nahrstedt	Pearson Education
6	Multimedia Communication Directions and Innovations	J.D. Gibson	Academic Press, Hardcourt India
7	Computer Networking	J.F. Kurose, K. W. Rose	Pearson Education

COURSE CODE: 5T502 COURSE NAME: OBJECT ORIENTED MODELLING AND DESIGN

Teaching Scheme		Evaluation Scheme						
TH	4		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	--	25	150
TOTAL	6	Duration	1	3	--	--	--	--

RATIONALE:

Object oriented modeling and design presents an Object Oriented approach to software development. It is based on modeling objects from the real world and then using the model to build a language-independent design. This subject shows how to use Object Oriented concepts throughout the entire software life cycle, from analysis through design implementation by using different models. The graphical notation i.e. described in subjects helps the software developer to visualize a problem before going for implementation. This subject will be useful for the student to understand the concepts of Object Oriented Programming System and to model these concepts using Unified Modeling Language (UML) for any application, before actually going for coding part.

COMPETANCY STATEMENT (S):

Students will be able to write Object oriented programs, which will be more compact, portable, efficient and easier to maintain.

COURSE OBJECTIVES:

The student will be able to:

1. Interpret / give the meaning of object-oriented concepts.
2. Understand different Modeling 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 and sequence diagram collaboration, use case diagram, state diagram, activity.
6. Usage of anyone design tool.

CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1	**Introduction of Modeling** 1.1 Brief overview of Object Modeling Technology (OMT) by Ram Baugh, 1.2 Booch methodology, Use Case driven approach (OOSE) by Jacobson, 1.3 Overview of CRC card method by Cunningham. **1.4** Importance of Modeling, Four principles of Modeling	**08**	**12**
2	**Object Modeling** 2.1 Objects and Classes (Object Diagrams, Attributes, Operations and Methods), 2.2 Links, Associations and Advanced Concepts (General Concepts, Multiplicity, Link Attributes, Association as a Class, Roll names,	**14**	**18**

	Ordering, Qualification, Aggregation). 2.3 Generalizations and Inheritance, Grouping Constructs. 2.4 Aggregation verses Association And Generalization, 2.5 Recursive Aggregates, and Propagation of Operations. 2.6 Abstract Classes, Multiple Inheritance, Metadata, 2.7 Candidate Keys, Constraints Introduction to Dynamic and Functional Modeling		
3	**Overview of UML** 3.1 Overview of UML, 3.2 Scope of UML, Conceptual model of UML, 3.3 Architectural – Metamodel, 3.4 Unified Software Development Lifecycle. 3.5 Introduction to UML Diagram	**08**	**12**
4	**UML – Structural Modeling and Use Cases** 4.1 Class Diagram and Advanced Class Diagrams 4.2 Advanced Classes and Relationships, 4.3 Interfaces, Types and Roles, 4.4 Packages, Instances. Object Diagram. 4.5Use case diagram: Terms and Concepts, Modeling techniques.	**10**	**12**
5	**UML Behavioral Modeling** 5.1 Interaction diagram-Sequence and collaboration diagram, Terms and Concepts, Modeling techniques. 5.2 State chart diagram: Terms and Concepts, Modeling techniques. 5.3 Activity diagram: Terms and Concepts, Modeling techniques. 5.4 Component Diagrams: Terms and Concepts, Common modeling techniques. 5.5 Deployment Diagrams: Terms and Concepts, Common modeling techniques	**13**	**16**
6	**Introduction XML** 6.1 Basic of XML, 6.2 XML support in .NET , 6.3 XML validation overview, 6.4 XML Parsing XML with the XML text Reader , 6.5 Parsing XML using DOM object, 6.7 generating XML with XML text writer .	**07**	**10**

LIST OF PRACTICALS:

1. Analyze and Design the UML diagrams for
- ATM System
- Railway Reservation System
- Library Management System.

Analyze and design the UML diagrams & develop programme for minimum three systems.

Any eight Assignment/ programs should be completed according to course content.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion &Correction of journal, Level ofParticipation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

REFERENCES BOOKS:

Sr. No.	Author	Title	Publisher
01	Rumbaugh, Blaha	Object Oriented Modelling and Designing	PHI
02	Booch, Jacobson, Rumbaugh	The UML User Guide	Addison Wesley
03	Mark Paiestly	Practical OOD with UML	PHI
04	B Meyer	Object Oriented software Constructions	PHI
05	Sinon alhair	UML In a Shell	PHI

Course Code: 5T503
Course Name: SOFTWARE PROJECT MANAGEMENT & TESTING

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	06	Duration	1 Hr	3 Hrs				

RATIONALE:
This subject will introduce you to basics of software project management, software project scheduling & risk management & software testing, teaching you not just the fundamental testing skills but also the supporting skills necessary to become a successful tester. You will learn how to find problems in any computer program immediately, how to plan an effective test approach, how to report your finding clearly and how to tell when your software is ready for release.

COMPETENCY STATEMENT (S):

- Define and highlight importance of software project management.
- Describe the software project management activities
- Understand and apply new testing skills to test not just the software, but also the product specification the raw code, and even the user's manual
- Learn how to test software for compatibility, usability and cultural issues.
- To introduce software project management and to describe its distinctive characteristics.

OBJECTIVE: Students will be able to

1. Compare various project process models & use in project planning.
2. Understand basic concepts of project scheduling.
3. Understand basic concepts of Estimation.
4. Understand Risk Management.
5. Understand the impact of software bugs and importance of software testing
6. Develop the skills necessary to find bugs in any types of software.
7. Learn how to plan your tests effectively, communicate the bugs you find, and
8. Measure your success as a software tester.
9. Discover how to improve your testing efficiency by automating your tests.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Project Management** 1.1 The management spectrum: 1.1.1 The People, 1.1.2 The Product, 1.1.3 The Process, 1.1.4 The Project, 1.2 W^5HH Principle, 1.3 Critical Practices,	10	15

CT DC HOD CDIC

	1.4 Software Measurement, 1.5 Metrics for Software Quality.		
2	**Estimation** 2.1 Software scope & Feasibility, 2.2 Resources, 2.3 Software project estimation, 2.4 Decomposition Techniques, 2.5 Emppirical Estimation models, 2.6 The Make / Buy Decision	10	15
3	**Project Scheduling & Risk Management** 3.1 Basic concepts: 3.1.1Project Scheduling, 3.1.2 Defining a task set for software project, 3.1.3 Defining a task network. 3.2 Earned value analysis, 3.3 Reactive Vs Proactive Risk Strategies, 3.4 Software Risks, Risk Identification, Risk Projection, Risk Refinement.	08	08
4	**Quality and Change Management** 4.1 Quality Concepts: Quality, 4.2 Quality Control, 4.3 Quality Assurance, 4.4 Cost of Quality. 4.5 Software Quality Assurance, 4.6 Software Reviews, Formal Technical Reviews, 4.7 Statistical Software Quality Assurance, 4.8 Software Reliability, 4.9 ISO 9000 Quality Standards, 4.10 Software Configuration Management, The SCM Process.	08	08
5	**Software Testing Fundamentals** 5.1 Strategic approach to Software Testing, 5.2 What Is a Bug? Terms for Software Failures, Why Do Bugs Occur? The Cost of Bugs, 5.3 What Exactly Does a Software Tester Do? 5.3.1 Testing Axioms (introduction) , 5.3.2 Software Testing Terms 5.4 Definitions: 5.4.1Unit testing, 5.4.2 Integration Testing, 5.4.3Regression Testing, 5.4.4 Smoke Testing, 5.4.5 System Testing, 5.4.6 Security Testing, 5.4.7Stress Testing, 5.4.8 Performance Testing Precision and Accuracy, 5.5 Verification and Validation, Quality and Reliability Testing	08	10

6	**Black Box Testing** 6.1 Black-Box and White-Box Testing, 6.2 Static and Dynamic Testing, 6.3 Static Black-Box Testing: Testing the Specification, Performing a High-Level Review of the Specification, 6.4 Review and Test Similar Software, 6.5 Low-Level Specification Test Techniques, 6.6 Dynamic Black-Box Testing: Testing the Software While Blindfolded, Test-to-Pass and Test-to-Fail, 6.7 Equivalence Partitioning, 6.8 Data Testing, Boundary Conditions, 6.9 Sub-Boundary Conditions, Default, Empty, Blank, Null, Zero, and None, Invalid, Wrong, Incorrect, and Garbage Data, 6.10 State Testing, 6.11 Testing the Software's Logic Flow, Testing States to Fail, Other Black-Box Test Techniques	06	08
7	**White Box Testing** 7.1 Static White-Box Testing: 7.1.1 Examining the Design and Code, 7.1.2 Formal Reviews, 7.1.3 Peer Reviews, 7.1.4 Walkthroughs, 7.1.5Inspections, 7.2 Coding Standards and Guidelines, 7.3 Generic Code Review Checklist, 7.4 Types of errors Data Reference, 7.5 Data Declaration, Computation, 7.6 Comparison, Control Flow, 7.7 Subroutine Parameter, 7.8 Input/ Output, Other Checks, 7.9 Dynamic White-Box Testing, 7.9.1 Dynamic White-Box Testing Versus Debugging, 7.10 Unit and Integration Testing, Data and code coverage (introduction)	06	06
8	**Automated Testing and Test Tools** 8.1 The Benefits of Automation and Tools, 8.2 Test Tools Viewers and Monitors, 8.3 Drivers, Stubs, Stress and Load Tools, 8.4 Software Test Automation, 8.5 Macro Recording and Playback, 8.6 Programmed Macros, 8.7 Fully Programmable Automated Testing Tools	04	05
9	**Planning Your Test Effort** a. The Goal of Test Planning, Test Phases, Test Strategy, b. Resource Requirements, c. Tester Assignments, Test Schedule, d. Test Cases, Bug Reporting, e. Metrics and Statistics, Risks and Issues, 9.6 The Goals of Test Case Planning, 9.7 Test Design, Test Cases, Test Procedures, 9.8 Test Case Organization and Tracking.	04	05

LIST OF PRACTICAL (ANY 10):

1. Assignment on Project scheduling.
2. Assignment on Estimation using COCOMO-II
3. Assignment on ISO 9000.
4. Assignment on Risk management.
5. Assignment on Six Sigma.
6. Write Test Cases For any Application (e.g. Railway Reservation Form)
7. Display "Hello World"
8. Write Test Case to demonstrate use of 1) For ...Loop 2) Switch ... Case 3) Do...While 4) If....elseTest any GUI Application e.g. Calculator
9. Study of Various testing tools.
10. Assignments using Test Director.
11. Assignments using Test Director.
12. Assignments Using Win Runner.
13. Assignments Using Win Runner.

TERMWORK:
Student should submit a term work in the form of journal containing at least 10 (Ten) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:
The oral examination will be based on the above mentioned assignments. Questions will be asked during the oral examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

TEXT BOOKS

S.No.	Name of Book	Author	Publication
01	Software Engineering – A Practitioner's Approach	Roger S. Pressman	TMH publication
02	Software Testing	Ron Patton	SAMS Techmedia
03	Software Testing	Ron Patton	Pearson 2nd edition
04	Software Testing : Principals and Practical	Srinivasan Desikan, Gopalaswamy Ramesh	Pearson Education

Course Code: 5T504 Course Name: Mobile Computing

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	06	Duration	1.00	3.00	--	--	--	--

RATIONALE:

To impart an understanding of fundamental concepts underlying current developments in mobile communication systems and wireless computer networks.

COMPETENCY STATEMENTS:

1) Students will learn operation of different mobile technologies.
2) Understand mobile communication systems.

OBJECTIVE

Students will be able to:-
1. To make students familiarize with Wireless Networking.
2. To know the basics of WAP and WML
3. To familiarize students with open source tools for Mobile Applications

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Introduction** 1.1 PCS Architecture, Cellular Telephony, Cordless Telephony and Law-Tier PCS. 1.2 Third-Generation Wireless Systems.	5	6
2	**Mobility Management** 2.1 Handoff, Roaming Management 2.2 Roaming Management under SS7.	6	8
3	**Handoff Management: Detection and Assignment** 3.1 Handoff Detection, Strategies for Handoff Detection 3.2 Channel Assignment, Link Transfer Types, Hard Handoff, Soft Handoff.	8	10
4	**Cellular Digital Packet Data and GSM Mobility Management**	8	10

	4.1CDPD Architecture, 4.2 GSM Architecture, Location tracking and call setup, Security, 4.3 Data Services: HSCSD, GPRS, 4.4 GSM Location update, Mobility Databases.		
5	**Mobile Number Portability and GPRS** 5.1 Number portability for mobile network, Mobile number portability mechanisms 5.2 GPRS Architecture, GPRS network nodes.	8	10
6	**Wireless Application Protocol (WAP)** 6.1WAP Model, WAP Gateway, WAP protocols	6	8
7	**Wireless Markup Language** 7.1 Markup Languages, An Introduction to XML 7.2 Fundamentals of WML, Writing and Formatting Text, Navigating Between Cards and Decks, Displaying Images, Tables, Using Variables, Acquiring User Input	12	14
8	**Wireless Markup Language Script** 8.1 Introduction to WMLScript, WMLScript Control Structures, Events, Phone.com Extensions, Usability, 8.2 Application of Mobile computing: ASP and Dynamic WAP Sites,Developing WAP Applications using Emulators.	11	14

LIST OF EXPERIMENTS:

Any 12 (Twelve) laboratory experiments and/or assignments from following list :

1) Study of WAP and WML
2) Design & Develop a program to format a text.
3) Design and develop program for navigating between cards and decks
4) Design & Develop a program to display data in tabular format.
5) Design & Develop a program for user input
6) Displaying of Image using WML
7) Study of WML scripts basics
8) If – else structure of WML script
9) Design & Develop a program to handle different events.
10) Design & Develop a program to convert currency.
11) Design & Develop a program to perform validation using WML script.
12) Assignment on latest Open Source Operating Systems for Mobile
13) Study of Bluetooth technology.
14) Study of Wi-Fi technology.
15) Study of 4G Technology

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:

Oral examination will be based on the term work submitted by the student and the theory of the subject.

TEXT BOOKS

S.No.	Name of Book	Author	Publication
1	Wireless and Mobile Networks Architecture	Yi Bing Lin, Imrich chlamtac	John Wiley
2	The Beginning WML and WML Script	Wrox	Wrox Publication
3	Mobile Communications	Jochen Schiller	Pearson Education

COURSE CODE: 5T505
COURSE NAME: ADVANCED JAVA PROGRAMMING

Teaching Scheme		Evaluation Scheme						
TH	3		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	--	25	150
TOTAL	05	Duration	1	3	--	--	--	--

RATIONAL:

In the current era of networking, online transaction processing and managing the dataflow over network becomes an important issue. This subject is essential for providing knowledge and hands on experience over the issues of managing data on web, developing powerful GUI based friendly user interface, server side programming and developing applications for communication over network using object oriented fundamentals.

COMPETENCY STATEMENT (S):

Advanced Java enhances the Java programming. After learning this subject, student will be able to develop network based software projects required in curriculum as well as industry

COURSE OBJECTIVES:

After study this subject, the student will be able to

1. Create network based applications.
2. Create business applications.
3. Implement Server side programming.
4. Develop dynamic software components.
5. Develop database application.
6. Design and develop powerful GUI based components.
7. Create Animation using Applet, Thread and AWT controls

CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1	**Introduction the Abstract Window Toolkit: (AWT)** 1.1 Using AWT Controls, Layout Managers and Menus, Control Fundamentals: **1.2** Window: Frame, panel, container, canvas. Components: Using Buttons, Applying Check Boxes, Checkbox Group, Choice Controls, Using Lists Managing scroll Bars, Using a Text Field, Using a Text Area, Understanding Layout Managers Menu Bars and Menu Dialog Boxes File Dialog.	**10**	**15**
2	**Event Handling** 2.1 Event handling mechanism, Delegation event model, 2.2 Event listeners and event classes, types event classes, 2.3 Event handling for each components (controls- button, checkboxes, choices ,textbox, list)	**10**	**15**

3	**Servlet** 3.1 Life cycle of Servlet, 3.2 how to run Servlet using Apache tomcat, simple Servlet program., 3.3 Servlet API, javax.servlet package(All interfaces and classes). Reading Servlet parameter, 3.4 javax.servlet.http package(All interfaces and classes) Database connectivity using Servlet.	**8**	**12**
4	**Networking** 4.1 Basics Socket overview, client/server, reserved sockets, proxy servers, internet addressing. 4.2 Java & the Net The networking classes & interfaces. 4.3 Internet address Factory methods, instance method, What is URL , Format, URL connection, 4.4 Creating TCP Client, Creating TCP Server, Reading and Writing from TCP Sockets, 4. 5Accepting and Processing request from TCP Client, Data grams, Data gram packets, Data gram server	**8**	**12**
5	**A Tour of Swing** JApplet, Icons and labels, text field, buttons: JButton class, checkboxes, All AWT control using swing class	**06**	**10**
6	**Java** server pages 6.1 Introduction to JSP, what is the need of JSP?, 6.2 Comparison between ASP &JSP. 6.3 JSP Architecture, Different tags of JSP, How run JSP page, 6.4 Simple JSP program, passing data to JSP page through HTML page. 6.5 Scripting in JSP, Session handling, Handling exception in JSP, Database connectivity in JSP.	**08**	**16**

LIST OF PRACTICALS

12. Write a simple java program .
13. Write a java program using Statements, Expression Operator & Function , Condition, Loop, Switch, Array
14. Write a java program to demonstrate use of Classes With Objects.
15. Write a java program to demonstrate use of Subclasses.
16. Program To Create Instance & Class Variable, Method.
17. Write a java program to demonstrate use of Command Line Argument.
18. Write a java program Using Method Overriding.
19. Write a java program to implement concept of threading
20. Write a java program to implement concept of Exceptional handling
21. Write a Simple Program On Applets.
22. Write a java program Using Graphics To Draw ,Fill, Use Color

12 Create Small Application For frame

13. Create Small Application using graphics in frame
14. Implementation of I/O stream classes.

TERMWORK:

Student should submit aterm work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion &Correction of journal, Level ofParticipation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

The practical examination will be based on the above mentioned assignments. Student should be able to execute / perform experiment successfully at the time of practical examination and well documented record of the same should be submitted.

Questions will be asked during the practical examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher & Edition
1	Andrea Steelman Joel Murach	Murach's Java Servlets and JSP	--
2	Marty hall & Larry Brown	Core servlets and Java Server Pages	Mc Graw Hill
3	Phil Hanna	Jsp 2.0: The Complete Reference	Mc Graw Hill

Course Code: 5T506
Course Name: ADVANCED DATABASE MANAGEMENT SYSTEM (ADBMS)

Teaching Scheme		Evaluation Scheme						
TH	3		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	-	25	150
TOTAL	5	Duration	1 Hour	3 Hours	-	-	2 Hours	-

RATIONALE:
Every organization / establishment/ office / shops needs to keep records of day-to-day activities. If these records are kept on computer then it will be very easy for maintenance and quick retrieval. It will help to make correct and quick decision. Regular as well as adhoc reports can be quickly generated. This helps low, middle and even top level management of an organization for decision making.

COMPETENCY STATEMENTS:
1. Develop concepts of Different types of Databases.
2. Understand the Features of different Databases.

OBJECTIVE
Students will be able to :-
1. Understand the salient features of various types of databases.
2. Understand the Transaction management.
3. Apply the concurrency Control Technique.
4. Know the database Security Issues.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Transaction Processing** 1.1Transaction Processing Concepts 1.2 Introduction to Transaction Processing 1.3 Transaction and System Concept 1.4 Desirable properties of Transactions 1.5 Scheduling and Recoverability 1.6Serializability of Scheduling 1.7 Transaction Support in SQL	08	15
2	**Concurrency Control Techniques** 2.1Two-Phase Locking Techniques for Concurrency Control 2.2Types of locks and system log tables 2.3Guaranteeing Serializability by Two-Phase locking 2.4 Dealing with Dead Lock and Starvation.	10	15
3	**Object –Oriented Databases** 3.1New Database Applications 3.2The Object-Oriented Data Model	10	16

	3.2.1Object Structure 3.2.2Object Classes 3.2.3Inheritance 3.2.4Object Identity 3.2.5Object Containment 3.3Object-Oriented Languages And Persistent Programming Languages.		
4	**Parallel Databases** 4.1Introduction 4.2I/O Parallelism 4.2.1Interquery Parallelism 4.2.2Intraquery Parallelism 4.3Intraoperation Parallelism 4.4Interoperation Parallelism 4.5Design of Parallel System.	07	12
5	**Distributed Databases** 5.1Distributed Data Storage 5.2Distributed Query Processing 5.3Distributed Transaction Model 5.4Coordinator Selection 5.5Deadlock Handling 5.6 Multidatabase System.	07	12
6	**Database Security** 6.1Introduction to Database Security Issues 6.2Types of Security 6.3Control Measures 6.4Database Security and the DBA 6.5Introduction to Statistical Database Security 6.6Challenges of Database Security.	06	10

LIST OF EXPERIMENTS:

Any 12 (Twelve) laboratory experiments and/or assignments from following list :

1. Assignment Based on Transaction Processing
2. Assignment Based on properties of Transactions
3. Assignment Based on Serializability of Scheduling
4. Assignment Based on Two-Phase Locking Techniques for Concurrency Control
5. Assignment Based on Types of locks
6. Assignment Based on Dead Lock and Starvation
7. Assignment Based on Object-Oriented Data Model
8. Assignment Based on Persistent Programming Languages
9. Assignment Based on Interquery Parallelism,Intraquery Parallelism
10. Assignment Based on Interoperation Parallelism, Interoperation Parallelism
11. Assignment Based on Distributed Query Processing
12. Assignment Based on Distributed Transaction Model
13. Assignment Based on Statistical Database Security
14. Assignment Based on Challenges Of Database Security.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.
30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:
Oral examination will be based on the term work submitted by the student and the Theory of the subject.

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher & Edition
01	A. Silberschatz, H. Korth	Database System Concepts, Fifth Edition,	McGraw-Hill International
02	S. B.Navathe	Fundamental of Database System	Pearson Ediction
03	Bipin Desai	Database Management System	
04	C.J.Date	An Introduction toData Base System	Addison Wesley

Course Code: 5T507 Course Name: IT in Forensic Science

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	05	Duration	1.00	3.00	--	--	--	--

RATIONALE:

Computer Forensics World is a growing community of professionals involved in the digital forensics industry. It is an open resource, free for all to access and to use. It strongly encourages the sharing of information and peer to peer assistance.

Computer Forensics is used to retrieve and analyze data. The practice of Computer Forensics responds to an event by gathering and preserving data, analyzing data to reconstruct events, and assessing the state of an event.

COMPETENCY STATEMENTS:

Students will learn use of IT in forensic science.

Understand computer forensic and forensic science.

OBJECTIVE

The students will be able to:

1. Understand the authentication and biometrics.
2. Understand the common biometrics.
3. Understand the information hiding in Steganography.
4. Understand the principles of Steganography.
5. Understand the Steganography techniques and Steganlysis.
6. Understand the Watermarking and Transform method.
7. Understand the computer forensic.

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	1.1 Overview of Biometrics, Biometric Identification, Biometric Verification, Biometric Enrollment, Biometric System Security. 1.2 Authentication and Biometrics: Secure Authentication Protocols, Access Control Security Services, Matching Biometric Samples, and Verification by humans.	9	14

	1.3 Common biometrics: Finger Print Recognition, Face Recognition, Speaker Recognition, Iris Recognition, Hand Geometry, Signature Verification.		
2	2.1 Introduction to Information Hiding: Technical Steganography, Linguistic Steganography, 2.2 Copy Right Enforcement, Wisdom from Cryptography Principles of Steganography:Framework for Secret communication, Security of Steganography System, Information Hiding in Noisy Data , Adaptive versus non-Adaptive 2.3 Algorithms, Active and Malicious Attackers, Information hiding in Written Text.	9	18
3	3.1 A Survey of Steganographic Techniques: Substitution systems and Bit Plane Tools, Transform Domain Techniques: - Spread Spectrum and Information hiding, Statistical Steganography, Distortion Techniques, Cover Generation Techniques. 3.2 Steganalysis: Looking for Signatures: - Extracting hidden Information, Disabling Hidden Information.	10	18
4	4.1 Watermarking and Copyright Protection: Basic Watermarking, Watermarking Applications, Requirements and Algorithmic Design Issues, Evaluation and Benchmarking of Watermarking system. 4.2 Transform Methods: Fourier Transformation, Fast Fourier Transformation, Discrete Cosine Transformation, Mellin-Fourier Transformation, Wavelets, Split Images in Perceptual Bands. Applications of Transformation in Steganography.	12	20
5	5.1 Computer Forensics, Rules of evidence, Evidence dynamics, Evidence collection, Data recovery, Preservation of digital evidence, surveillance tools for future warfare.	8	10

LIST OF EXPERIMENTS:

Any 08 (EIGHT) experiments and/or assignments from following list :

16) Study of Bio-metric System Security.

17) Study of Finger Print recognition.

18) Study of Face recognition.

19) Study of Iris recognition.

20) Study of Information hiding.

21) Study of principles of Steganography techniques.

22) Study of stegnalysis algorithm for detecting hidden information image.

23) Study of digital water marking.

24) Study of transformation method (Any one mentioned in the syllabus).

25) Study of computer forensics.

26) Study of techniques in computer forensics.

TERMWORK:

Student should submit a term work in the form of journal containing at least 12 (Twelve) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-

30% weightage will be for Regular Attendance, Punctuality.

40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

PRACTICAL EXAMINATION:

Practical examination will be based on the term work submitted by the student and the theory of the subject.

TEXT BOOKS

S.No.	Name of Book	Author	Publication
1	Information Hiding Techniques for Steganography and Digital watermarking	Katzendbisser, Petitcolas	Artech House
2	Disappearing Cryptography: Information Hiding, Steganography and Watermarking	Peter Wayner	Elsevier 2nd edition
3	Guide to Biometrics	Bolle, Connell et. al	Springer
4	Computer Forensics: Crime scene Investigation	John Vecca	Firewall Media
5	Computer Evidence: Collection and Preservation	Christopher L.T. Brown	Firewall Media

Course Code: 5T508 **Course Name: SOFT COMPUTING**

Teaching Scheme		Evaluation Scheme						
TH	03		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	150
TOTAL	05	Duration	1 Hr	3 Hrs				

RATIONALE:

The principal constituents of Soft Computing (SC) are Fuzzy Logic (FL), Neural Computing (NC), Evolutionary Computation (EC) Machine Learning (ML) and Probabilistic Reasoning (PR), with the latter subsuming belief networks, chaos theory and parts of learning theory. What is important to note is that soft computing is not a melange. Rather, it is a partnership in which each of the partners contributes a distinct methodology for addressing problems in its domain. In this perspective, the principal constituent methodologies in SC are complementary rather than competitive. Furthermore, soft computing may be viewed as a foundation component for the emerging field of conceptual intelligence.

COMPETENCY STATEMENT:

To provide basic concepts & Engineering Applications of Fuzzy logic & Neural Network.

OBJECTIVES

1. To study models of ANN and Fuzzy Logic.
2. To be able to apply these models in practice for solving problems in diverse areas such as pattern recognition, pattern matching.
3. To study and understand techniques of Feed forward and feedback neural net

COURSE CONTENTS:-

Sr.No.	Name of the Chapter / topic (Follow S.I. units)	Hours	Marks
1	**Basics of Artificial Neural Network** **1.1** Characteristics Of Neural Networks, **1.2** Structure And Working Of A Biological Neural Network, **1.3** Artificial Neural Network: Terminology, **1.4** Models Of Neurons: Mcculloch Pitts Model, Perceptron Model, Adaline Model, **1.5** Topology, Basic Learning Laws.	08	15
2	**Feedforward Neural Networks** 2.1 Introduction, 2.2 Analysis Of Pattern Association Networks, 2.3 Analysis Of Pattern Classification Networks, 2.4 Analysis Of Pattern Mapping Networks.	08	15
3	**Feedback Neural Networks** a. Introduction, b. Analysis of Linear Auto associative FF Networks, c. Analysis of Pattern Storage Networks, d. Stochastic Networks and Simulated Annealing, Boltzmann Machine.	08	12

4	**Classical and Fuzzy Sets** 4.1 Introduction, 4.2 Fuzzy Set Theory, 4.3 Crisp Sets, 4.4 Partition And Covering, 4.5 Classical Sets, Operation On Classical Sets, Properties Of Classical Sets, 4.6 Fuzzy Sets, Membership Function, Fuzzy Set Operations, Properties Of Fuzzy Sets, 4.7 Crisp Relations, Operations Of Crisp Relation	08	14
5	**Fuzzy Logic in database and Information systems Fuzzy** 5.1 Information, Fuzzy Logic In Database Systems, 5.2 Fuzzy Relational Data Models, 5.3 Operations In Fuzzy Relational Data Models, 5.4 Design Theory For Fuzzy Relational Databases, 5.5 Fuzzy Information Retrieval And Web Search, 5.6 Fuzzy Object Oriented Databases.	08	12
6	**Neural Network Application** 6.1 Process Identification, 6.2 Neural Networks In Forecasting, 6.3 Neural Networks In Control, 6.4 Fuzzy Control Systems, 6.5 Classical Fuzzy Control Problem, 6.6 System Identification Problem, 6.7 Control System Design Problem, 6.8 Simple Fuzzy Logic Controllers.	08	12

LIST OF EXPERIMENTS: (Any 10)

1) Study of McCullohPitts model.
2) Study of Perceptron model.
3) Study of Hopfield model.
4) Study of Delta rule.
5) Study of back propagation rule.
6) Study of model for multilayer Perceptron.
7) Study of pattern classification and pattern clustering.
8) Study of Fuzzy Relational database.
9) Study of Object Oriented database.
10) Introduction to Fuzzy Control Systems.
11) Study of Neural Network Application

TERMWORK:

Student should submit a term work in the form of journal containing at least 10 (Ten) experiments and /or assignments conducted during the course from the List of Experiments.

Each experiment / assignment has to be well documented with Aim, Theory, Algorithm, Code, Output, Diagram, and Conclusion (as applicable).

Grade / Marks will be given by respective subject teacher & will be evaluated as follows :-
30% weightage will be for Regular Attendance, Punctuality.
40% weightage will be for Timely Completion & Correction of journal, Level of Participation, Understanding of Subject.

30% weightage will be for Overall Performance of student in Class and Laboratory, Neatness, Presentation Skills, Discipline & Obedience.

ORAL EXAMINATION:

The oral examination will be based on the above mentioned assignments. Questions will be asked during the oral examination to judge the understanding of the students. It is expected that the student should know the theoretical aspect of the experiment / assignment, its applications and limitations (as applicable).

TEXT BOOKS

S.No.	Name of Book	Author	Publication
1	Artificial Neural Networks	B. Yegnanarayana	PHI 2nd Edition
2	Neural Networks A classroom Approach	Satish Kumar	
3	Fuzzy Logic	John Yen, Reza Langari	
4	Neural networks, Fuzzy Logic and Genetic AlgorithmsSynthesis and Applications	S. Rajasekaran, Vijaylakshmi Pari,	
5	Soft computing and Fuzzy Logic	Lotfi A. Zadeh	
6	Neural Networks and Fuzzy Logic	K. Vinoth Kumar R. Saravana Kumar	Katson Books