SCOPE OF DIPLOMA IN COMPUTER ENGINEERING

Computer engineering embodies the science and the technology of design, construction, implementation and maintenance of the hardware and the software components of modern computing systems and computer-controlled equipment.

Computer engineers are solidly grounded in the theories and principles of computing, mathematics and engineering, and apply these theoretical principles to design hardware, software, networks, and computerized equipment and instruments to solve technical problems in diverse application domains.

Computer Engineering focuses on the design, analysis and application of computers and on their applications, as components of systems.

The Computer Technology provides a broad overview of the underlying hardware and software technologies of the computer age within the context of society. As much computer engineering as you can do without calculus.

Computer Engineering includes Designing computers, Designing computer-based systems, (e.g. Embedded systems, Autonomous systems, Multimedia systems etc.) Creating design tools for computer engineering Computer engineering is a mix of hardware and software; some problems are best solved with software Other problems are best solved with hardware, The most fun problems require hardware and software.

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 Computer Engineering 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

S. No.	Type of industries/ organizations	Capacity (Designation) in which employed
i)	Computer Hardware	H/W maintenance Engineer
ii)	Computer Services	Customer support Engineer, Supervisor
iii)	Consultancy services	Providing services to customer, organizations
iv)	Software Development	S/W Testing/Trainee/Customer Support Programmer, Database Administrator
v)	Electronics and communication organizations	Trainee Technician
vi)	Desktop Support technician	Network Analyst
vii)	System Network administrator	Network Administrator
viii)	Self Taught Computer Repairman	H/W maintenance, assemble
IX	Technical Support Analyst	Trainee Engineers
X	Web developer	Web Application developer

JOB FUNCTIONS

Sr. no.	Designations of the diploma holders in various employment	Job functions
i)	Computer Hardware	• Working with different computer systems. • Planning to build assembled computers. • Solving minor problems of Hardware parts.
ii)	Computer Services	• Provide services to industries. • Provide services to organizations. • Provide services to customers.
iii)	Software Development	• Study the design of complete system • Choose / write appropriate algorithm to solve the problem • Implement the design using various design • tools/programs / Language/Application Software
iv)	Desktop Support technician	• Study the desktop facility • .Working on different types of operating systems. • Study the N/W connectivity • Solving the desktop related problems.
v)	Self Taught Computer Repairman	• Understand the computer hardware assembly • Understand the various hardware parts of computer system. • Solve the hardware related problems of different computer systems.
vi)	Technical Support Analyst	• Asst. supporter for engineer. • Solving minor problems of S/W, H/W, Web activity, databases, N/W.
IX	System Network administrator	• Planning implementing Network. • Working in Heterogeneous network. • Implementing switches, Leased lines, Routers, Hubs etc • Backing up data. • Network Security
X	Web developer	• Study the design of complete system • Choose / write appropriate algorithm to solve the web based problem • Implement the design using various design • tools/programs / Language/Application Software • Web Server administration • Web based application development • Documentation qualities

XI	Electronics and communication organizations	• Study the data communication for computer network • Connectivity to various methods for data communication.

PROGRAMME AIM:

To provide students with a balance of Computer engineering theory and practical skills that will enable them to develop a sound knowledge and analytical ability allowing them to develop professionally in pursuit of future employment at junior level in the computing sector and higher studies.

IDENTIFIED COMPETENCIES FOR DIPLOMA IN COMPUTER ENGINEERING

- Use and operate computers for data processing and communication.
- Efficient use of software packages.
- Diagnose the faults/viruses and remove it.
- Maintain the computer system and Network.
- Project management Skills.
- Plan, estimate, procure and install Hardware and Software.
- Analyze and design systems.
- Administrate and Manage Networks.
- Programming Skills.
- Web based application skills.
- Web server administration skills.
- Entrepreneurial skills.
- Life long learning and ability to acquire new knowledge and skills on self-learning basis.
- Ability to work in multidisciplinary and multinational teams.
- Positive attitude towards work and social responsibility.
- Develop S/W using open software Technology
- Develop S/W using .NET technology

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

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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.

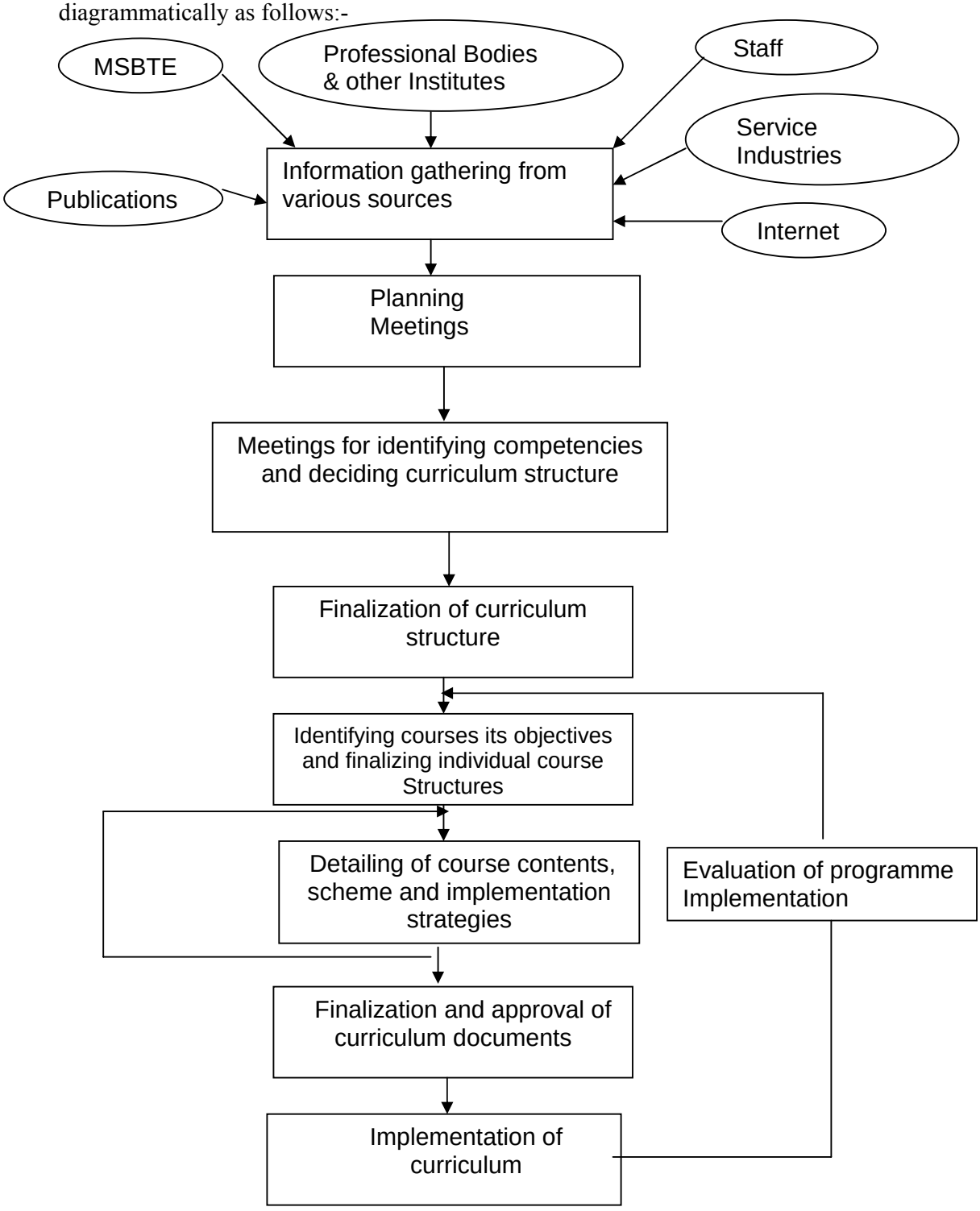
- Implementation strategies for each subject were identified.

- 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.

DEVELOPING/ FINALIZING A PROGRAMME STRUCTURE

Programme structure consisting of teaching and examination schemes was finally arrived at through consensus. The approach followed for curriculum development is shown diagrammatically as follows:-



PROGRAMME STRUCTURE

SR. NO	LEVELS	COMPULSORY COURSES	OPTIONAL COURSES	CREDITS COMP. + OPTIONAL	MARKING SCHEME		
					COMPULSORY COURSES	OPTIONAL COURSES	TOTAL
1	Foundation	07	Nil	28	--	28	750
2	Basic	08	Nil	33	--	33	925
3	Allied	06	02/15	24	04	28	600
4	Applied	13	01/04	62	05	67	1875
5	Diversified	04	01/04	23	05	28	750
	TOTAL	**38**	**04/23**	**170**	**14**	**184**	**4900**

Scheme at a glance:

Total number of courses offered : 60

Number of Compulsory courses : 42

Number of Optional course : 08 out of 23

Total courses to be opted : 50

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
							80	320	150	200	--	
TOTAL			**17**	**11**	**28**		**400**		**350**			**750**

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

Course Code Detailing:
G: Course common to all branches
S: Course common to Computer Engg & information Technology branches.
P: Course of Computer Engg branch

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	**5P201**	"C" Programming (CP)	4	2	6	II	20	80	25	25	--	150
02	**5P202**	Object Oriented Programming (OOP)	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 (SDT)	1	3	4	IV	--	--	-	50	50	100
08	**5S208**	Web Page Designing Laboratory (WPDL)	-	2	2	III	--	--	25	25	--	50
							90	360	125	250	100	
TOTAL			**16**	**17**	**33**		**450**		**475**			**925**

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 : 3

Total Marks :925

Course Code Detailing:
G: Course common to all branches
S: Course common to Computer Engg & information Technology branches.
P: Course of Computer Engg branch

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**

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

Course Code Detailing:
G: Course common to all branches
S: Course common to Computer Engg & information Technology branches.
P: Course of Computer Engg branch

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	IV	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	V	20	80	--	25	25	150
04	5S404	Dot NET Technologies Laboratory (DNTL)	0	4	4	V	-	-	50	50	-	100
05	5P405	Computer Architecture & Maintenance (CAM)	4	2	6	III	20	80	-	25	25	150
06	5P406	JAVA Programming (JP)	4	2	6	IV	20	80	25	25	--	150
07	5P407	Operating Systems (OS)	4	2	6	IV	20	80	-	25	25	150
08	5P408	Software Testing (ST)	4	2	6	VI	20	80	-	25	25	150
09	5P409	Adv.Web Page Designing Lab	0	2	2	V	--	--	--	50	50	100
10	5S410	Project (PRJ)	--	4	4	VI	--	--	--	100	50	150
11	5S411	Seminar (SMR)	--	2	2	V	--	--	--	50	50	100
12	5P412	Advanced Microprocessor (AMP)	3	2	5	IV	20	80	-	25	-	125
13	5P413	Professional Ethics & Cyber Security (PECS)	3	--	03	IV	20	80	--	-	-	100
14	***Optional Courses (Any One from Group A)***											
01	5P414	Mobile Computing (MC)	4	2	6	VI	20	80	--	25	25	150
02	5P415	Data Mining & Ware housing (DMW)	4	2	6	VI	20	80	--	25	25	150
03	5P416	Advanced Database Management System (ADBMS)	4	2	6	VI	20	80	--	25	25	150
04	5P417	Digital Image Processing (DIP)	4	2	6	VI	20	80	--	25	25	150
							200	800	125	525	225	
TOTAL			**38**	**30**	**68**		**1000**		**875**			**1875**

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 : 68
Total Marks : 1875

Course Code Detailing:
G: Course common to all branches
S: Course common to Computer Engg & information Technology branches.
P: Course of Computer Engg branch

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	5P501	Embedded System (ES)	4	2	6	VI	20	80	25	25	--	150
02	5P502	Computer Security (CS)	3	2	5	V	20	80	--	25	25	150
03	5P503	Software Engineering & Project Management (SEPM)	4	-	4	V	20	80	--	25	25	150
04	5P504	Multimedia & Animation Techniques (MAT)	4	2	6	VI	20	80	-	25	25	150
05	***Optional Courses (Any one from Group B)***											
01	5P505	System Programming (SP)	4	2	6	VI	20	80	--	25	25	150
02	5P506	Management of Information System (MIS)	4	2	6	VI	20	80	--	25	25	150
03	5P507	Computer Graphics (CG)	4	2	6	VI	20	80	--	25	25	150
04	5P508	Linux operating System (LOS)	4	2	6	VI	20	80	--	25	25	150
							100	400	25	125	100	
TOTAL			**19**	**08**	**27**		**500**		**250**			**750**

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 : 27
Total Marks : 750

Course Code Detailing:
G: Course common to all branches
S: Course common to Computer Engg & information Technology branches.
P: Course of Computer Engg branch

SAMPLE PATH (10TH PASS STUDENTS)

Year-I		Year-II		Year-III	
Odd	**Even**	**Odd**	**Even**	**Odd**	**Even**
5G101 (BMT) Basic Mathematics (04+00)	**5G102 (EMT)** Engineering Mathematics (04+00)	**5P202 (OOP)** Object Oriented Programming (3+2)	**5S207 (**Software Development Tool (SDT) (1+3)	**5G305 (INM)** Industrial Management (3+2)	**5S410 (PRJ)** Project (00+4)
5G103 (EPH) Engineering Physics (03+02)	**5G104 (ECH)** Engineering Chemistry (03+02)	**5S208 (WPDL)** Web Page Designing Laboratory (00+02)	**5G303 (EDP)** Entrepreneurship Development (2+2)	**5S403 (CN)** Computer Networks (4+2)	**5P408 (ST)** Software Testing (4+2)
5G106 (EGR) Engineering Graphics (02+02)	**5G105 (WSP)** Workshop Practice (00+03)	**5S301 (MPP)** Microprocessor & Programming (4+2)	**5S401 (DS)** Data Structures (4+2)	**5S411 (SMR)** Seminar (0+2)	5P504**(MAT)** Multimedia & Animation Techniques (4+2)
5G107 (BCS) Basics of Computer Systems (01+02)	**5P201 (CP)** "C" Programming (04+02)	**5G304 (EVS)** Environmental Science (2+0)	**5P406(JP)** JAVA Programming (4+2)	**5P503 (SEPM)** Software Engineering & Project Mgnt. (4+00)	**5P501 (ES)** Embedded System (4+2)
5S204 (BEDC) Basic Electronic Devices and Circuits (02+02)	**5S203 (ET)** Electrical Technology (03+02)	**5P405 (CAM)** Computer Architecture & Maintenance (4+2)	**5P407(OS)** Operating Systems (4+2)	**5P409 (AWDL)** Adv.Web Page Designing Lab(00+2)	**Elective – I (Any One from Group A)**
5S206 (CW) Computer Workshop (00+02)	**5S205 (DE)** Digital Electronics (3+2)	**5S402 (RDBMS)** Relational Database Management Systems (4+2)	**5P412 (AM)** Advanced Microprocessor (3+2)	**5P502 (CS)** Computer Security (3+2)	**5P414 (MC)** Mobile Computing (4+2)
5G301 (ENG) English (02+02)	**5G302 (CMS)** Communication Skills (01+02)	**Any one From 5G311 To 5G325** Non exam credit course (00+02)	**5P413(PECSL)** Professional Ethics & Cyber Security (03+0)	**5S404 (DNTL)** Dot Net Technologies Laboratory (0+4)	**5P415(DMW)** Data Mining & Ware housing (4+2)
	Any one From 5G311 To 5G325 Non exam credit course (00+02)				**5P416 (ADBMS)** Advanced DBMS (4+2)
					5P417 (DIP) Digital Image Processing (4+2)
					Elective – II (Any One from Group B)
					5P505 (SP) System Programming (4+2)
					5P506 (MIS) Management Information System (4+2)
					5P507 (CG) Computer Graphics (4+2)
					5P508 (LOS) LINUX operating system (4+2)
26	**33**	**29**	**34**	**28**	**34**
TOTAL CREDITS = 184					

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
5P201	'C' Programming (CP)	4	2	6	II	20	80	25	25	--	150
5S203	Electrical Technology (ETG)	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
5P202	Object Oriented Programming (OOP)	3	2	5	III	20	80	25	25	--	150
5S208	Web Page Designing Laboratory (WPDL)	-	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
5P405	Computer Architecture & Maintenance (CAM	4	2	6	III	20	80	--	25	25	150
5S402	Relational Database Management Systems (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**	**100**	**175**	**25**	**700**

SEMESTER-IV (FORTH)

COURSE CODE	COURSE TITLE	TEACHING SCHEME				EXAMINATION SCHEME					
		TH	PR	CR	TERM	PT	TH	PR	TW	OR	TOTAL
5S207	Software Development Tool (SDT) (1+3)	1	3	4	IV	--	--	-	50	50	100
5G303	Entrepreneurship Development (EDP)	2	2	4	IV	--	--	--	25	25	50
5S401	Data Structures (DS)	4	2	6	IV	20	80	25	25	--	150
5P406	JAVA Programming (JP)	4	2	6	IV	20	80	25	25	--	150
5P407	Operating Systems (OS)	4	2	6	V	20	80	-	25	25	150
5P412	Advanced Microprocessor	3	2	5	IV	20	80	--	25	-	125
5P413	Professional Ethics & Cyber Security (PECS)	3	-	3	IV	20	80	--	-	-	100
	TOTAL	**21**	**13**	**34**		**100**	**400**	**50**	**175**	**100**	**825**

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
5S403	Computer Networks (CN)	4	2	6	V	20	80	--	25	25	150
5S411	Seminar (SMR)	--	2	2	V	--	-	--	50	50	100
5P503	Software Engineering & Project Mgnt.	4	-	4	V	20	80	--	25	25	150
5P409	Adv.Web Page Designing Lab)		2	2	V	-	-	--	50	50	100
5P502	Computer Security	3	2	5	V	20	80	--	25	25	150
5S404	Dot Net Technologies Laboratory		4	4	V	-	-	50	50	-	100
	TOTAL	**14**	**14**	**28**		**80**	**320**	**50**	**250**	**100**	**900**

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
5P408	Software Testing	4	2	6	VI	20	80	-	25	25	150
5P504	Multimedia & Animation Techniques	4	2	6	VI	20	80	--	25	25	150
5P501	Embedded System	4	2	6	VI	20	80	25	25	--	150
Optional Courses (Any One from Group A)											
5P414	**Mobile Computing**	4	2	6	VI	20	80	--	25	25	150
5P415	Data Mining & Ware housing	4	2	6	VI	20	80	--	25	25	150
5P416	Advanced DBMS	4	2	6	VI	20	80	--	25	25	150
5P417	Digital Image Processing	4	2	6	VI	20	80	--	25	25	150
Optional Courses (Any One from Group B)											
5P505	System Programming	4	2	6	VI	20	80	--	25	25	150
5P506	Management Information System	4	2	6	VI	20	80	--	25	25	150
5P507	Computer Graphics	4	2	6	VI	20	80	--	25	25	150
5P508	LINUX Operating system	4	2	6	VI	20	80	--	25	25	150
TOTAL		**20**	**14**	**34**		**100**	**400**	**25**	**225**	**150**	**900**

5G101BASIC MATHEMATICS

COURSE STRUCTURE:

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):

1. To inculcate the practice of mathematic
2 Comprehend the principles of other subjects
3 Solve problems by using analytical and systematic approach**.**
4 The students will be able to develop process of logical thinking

CONTENTS:

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 3 2.3 Properties of Determinant 2.4Cramer's Rule (solution of simultaneous equations in three Unknowns)	**08**	**08**
3.	**Partial fractions** 3.1Definition of Rational fraction, Partial fractions, proper and improper 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 valued 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**
	TOTAL	**64**	**80**

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 STRUCTURE:

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:-

TOPIC NO	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 Curvature.	**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	**14**	**16**

3	3.1 Definition of differential equation, order &degree. 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**
	TOTAL	**64**	**80**

TEXT BOOKS:

S.No.	Name of Book	Author	Publication
1.	Mathematics for 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

ENGINEERING PHYSICS (EPH):-5G103

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**	01	03				

Competency statement : The Student will be able to:

1. Analyze different factors on which accuracy depends.
2. Differentiate between scalars and vectors

. 4. Describe principle and working of Laser.

5. Differentiate between conductor, insulator and semiconductor on the basis of band theory

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.

Topic no	**contents**	**hrs**	**marks**
01	**1 UNITS AND MEASUREMENTS** **1.1 D**efinition 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 linear velocity, definition of S.H.M **2.2 Kinetics:** Definition of momentum ,impulse ,impulsive force, Statements	**08**	**10**

	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.		
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** **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, Aerial and cubical expansion and relation between them.(no derivation)	**02**	**04**
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	**06**	**12**

	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	**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.	**04**	**08**

	(Numerical on Energy of photon, work function, Photoelectric equation) **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

5G104- ENGINEERING CHEMISTRY

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	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
01	**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 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, $Cacl_2$ &$Mgcl_2$, formation of Covalent Compounds examples H_2O, Cl_2, Co_2,	**08**	**10**
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**

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 & compression method 3.7 Classification of Alloys ,ferrous alloys & Non Ferrous alloys, their examples. 3.8 Composition, 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, 5.6 Potable water & its condition for potability, 5.7 Different methods of purification of water,Examples chlorination,sterlisation	**07**	**10**

06	**Non Metallic Materials** 6.1 Plastics Definition of Plastic, Formation of Plastic by Addition Polymerisation with example such as Polyethylene & PVC 6.2 Condensation Polymerisation with suitable example such as Bakelite plastic. 6.3Types of Plastics, Thermo softening & Thermosetting Plastic & difference between them 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 of glasswool, 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**

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 $BaCl_2$ with H_2SO_4 using Conductivity Meter. To find the normality and strength of $BaCl_2$
05) To find the normality & 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 normality & 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	Tech-Max Publications
3	chemistry of engineering materials	Jawale	Mc vranda publication. Inc.
4	Basic chemistry	Dr.D.D.Jadhav	Tech-Max Publications

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.	Environmental Chemistry & PollutionControl	S. S. Dara	S.Chand Publication

COURSE CODE:5G105 COURSE NAME: WORKSHOP PRACTICE

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	0	4				4
	Prog. Test	End Exam.				
Marks	-	-	--	50	--	50
Duration	-	-				

COMPENTENCY STATEMENT :
"TO PERFORM BASIC WORKSHOP PROCESSES".

RATIONALE :
The knowledge of different tools, and different processes such as turning, grinding, welding, gas welding, tapping 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.

COURSE:
At the end of the practical student will be able to practically understand & appreciate the use of Different hand tools and passive processes e.g. smithy, forging, carpentry, welding, plumbing, fitting.

LIST OF PRACTICALS :
Each candidate is required prepare the job in various sections as mentioned below and to submit the term work.

1. **SMITHY & FORGING :-** One composite job involving cutting, bending, drawing operations.
2. **CARPENTRY :-** Different types of joints (min. two joints) used in furniture, wooden items with the use of teak wood, combination of wood & steel frames, plywood, sunmica.
3. **WELDING :-** One commercial composite job involving operations such as Lap, Butt, welding joints.
4. **FITTING & FILLING :-**
   i) One composite job of male & female fitting.
   ii) Demo of Aluminum section fittings such as glass windows, partitions etc.

   PLUMBING :- One practical job on pipe bending and threading.

REFERENCE BOOKS:

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

COURSE CODE: 5G106 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	08	00

	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) 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

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,S hastri	Tata Mc Graw Hill
3	Engineering Drawing	R.V.Mali	Vrinda Publication

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

Particulars	Theory		Practical	T.W.	Oral	Total
Credits	01		02	--	--	03
	Prog. Test	End Exam				
Marks	--	--	50	50	--	100
Exam Duration	--	--	03			

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.**

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.

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)	02	00

	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).		
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,	04	00

	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.		
5.	**PowerPoint** 5.1 Overview, Using design template and auto content wizard, 5.2 Creating presentation, slides and its types, slide operations, modifying & running presentation, adding & editing objects, creating tables, charts & Diagram, save & print option ,custom presentation, applying transition & animation effects.	02	00
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: 5P201 COURSE TITLE: C PROGRAMMING (CP)

Teaching Scheme		Evaluation Scheme						
TH	4		PT	TEE	TW	PR	OR	Total
PR	2	Max.Marks	20	80	25	25	--	150
TOTAL	06	Duration	1	3	--	2		

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.

COMPENTANCY STATEMENT(S):

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

COURSE OBJECTIVES:

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, pointers and structures
6. Will create, read and modify the data files.

COURSE CONTENTS:-

Sr. No.	Name of the Chapter / topic	Hours	Marks
1	**Introduction To 'C' Programming.** 1.1 Introduction, History and features of C 1.2 Algorithms, Flowcharts, Structure of C Programming, 1.3 Data Types, Character set of C. 1.4 Operators and expressions: Arithmetic, Relational, logical assignment operators, variables, constants, key words.	06	08
2	**Input and Output statements.** 2.1 'C' programmed structure, Input and output (printf, scanf, getchar, putchar, getch, putch) 2.2 conversion specifiers in format control string, library functions, and Maths functions.	04	05
3	**Control and Loop Statements.** 3.1 Unconditional branching: goto statement. 3.2 Conditional branching statements: If statement, if- else, Nested 'if'., switch case statement 3.3 Loop statements: 'for' statement, 'while' statement, 'do-while' statement, break, continue statement.	12	14
4	**Arrays and strings.** 4.1 Arrays: Concept of one dimensional, two dimensional and multi	07	08

	dimensional array, 4.2 array declaration, array and initialization operations on one and two dimensional arrays. 4.3 String manipulations. :Strings, gets, puts, string operations, string function (concatenation, comparison, length of a string).		
5	**Functions.** 5.1 Library and user-defined functions, 5.2 concepts of library functions, user-define functions, 5.3 local and global variables, 5.4 storages class, parameter passing mechanisms.	**08**	**10**
6	**Pointers.** 6.1 Concept of pointer, pointer operation, 6.2 array of pointers, 6.3 call by reference concept, 6.4 passing and returning parameters using pointers, 6.5 pointer to function, pointer to pointer.	**08**	**10**
7	**Structures.** 7.1 Importance, declaration, Memory allocation of structure 7.2 array of structures, 7.3 structure within a structure, 7.4 structure and pointers, 7.5 passing and returning a structure, unions.	**07**	**08**
8	**File Handling.** 8.1 File, Concept of file pointer, 8.2 File operations reading, writing & appending a file. 8.3 File handling functions such as getc(),putc(),getw(),putw(),fscanf(),fprintf(),fseek(),ftell().	**12**	**12**

LIST OF EXPERIMENTS:

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

1. Assignment to prepare general algorithms and flowchart.
2. Assignment to write character, operators 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 pointers
15. Programs based on simple structures, nested structure, structure and pointer, passing and returning structures to functions.
16. Reading, writing, appending sequential files.

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: 5P202 COURSE NAME :OBJECT ORIENTED PROGRAMMING USING C++

Particulars	Theory		Practical	T.W.	Oral	Total
Credit	3		2			6
	Prog. Test	End Exam.	25	25	--	150
Marks	20	80				
Exam Duration	1	3				

COMPETANCY STATEMENT (S):

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

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.

COURSE OBJECTIVES: Students will understand

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.

CONTENTS:

Sr.No.	Name of the Chapter / topic	Hours	Marks
1.	**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 1.5 object oriented languages	**06**	**08**
2.	**Introduction To C++** 2.1 Concepts & structure of C++ programming 2.2 Using cin and cout statements, input & output operators 2.3 writing comments, cascading of I/O operators 2.3 data types in C++: basic data types, User defined data types, Derived data types 2.4 declaration & dynamic initialization of variables 2.5 operators in C++, manipulators, expressions & their types, 2.6 operator precedence, Control structures, main function 2.7 function prototyping, call by reference, return by reference 2.8 inline function, default arguments, function overloading, friend & virtual function	**08**	14

3.	**Objects & classes** 3.1 C structures, Specifying a class 3.2 Defining member functions, nesting of member functions 3.3 private member functions, Arrays within a class 3.4 Creating objects, memory allocation for objects 3.5 static data & member function 3.6 Arrays of objects 3.7 objects as function argument. Returning objects	**08**	14
4.	**Constructors and Operator overloading** 4.1 Constructors, parameterized constructor, multiple constructors in a class 4.2 Constructor with default argument 4.3 dynamic initialization of objects, copy constructor, dynamic constructor 4.4 Destructors. 4.5 Operator overloading: overloading unary & binary operators 4.6 rules for overloading operators, type conversions	**08**	14
5.	**Inheritance and pointer** 5.1 Concepts of inheritance 5.2 defining derived classes, Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance) 5.3 different access specifier (Visibility mode: public, private, protected) 5.4 Virtual base classes 5.5 Constructors in derived classes 5.6 Pointer: Concepts of pointer 5.7 using pointers with arrays & strings, arrays of pointers 5.8 pointers to functions, pointers to objects 5.9 this pointer, pointers to derived classes	**10**	**16**
6	**Polymorphism** 6.1 Concepts of polymorphism 6.2 types of polymorphism: Overloading & overriding 6.3 Virtual function, rules for virtual functions 6.4 Static & dynamic binding 6.5 pure virtual function 6.6 abstract Class.	**08**	14

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

REFERENCES BOOKS:

Sr. No.	Author	Title	Publisher
01	Robert Lafore	Object Oriented Programming in Turbo C++	GALGOTIA
02	Balguruwami	Object Oriented Programming with C++	TMH
03	Kanetkar	Let's C++	BPB

5S203 **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	--	--	--	--

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.

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.

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,	08	12

	reluctance, permeability. 2.3 Magnetic hysteresis, hysteresis loop, hysteresis loss. 2.4 Eddy currents & Eddy current loss. 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 $N-_{Ia}$ 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

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				

COMPETENCY STATEMENT:

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

RATIONALE:

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

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. 2.8 Filter: concept of filters, types, inductor filter, capacitor	**10**	**14**

	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)**

Particulars	Theory		Practical	T.W.	Oral	Total
Credits	03		02	--	--	05
	Prog. Test	End Exam				
Marks	20	80		25	25	150
Exam Duration	01	03				

COMPETENCY STATEMENT:
To construct and test circuits comprising of digital ICs.

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.

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	**17**	**28**

	gray code converter, gray to binary code converter, BCD to excess-3 code converter, excess-3 to BCD code converter.		
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,	00	00

	c. types of Memory, Memory Packages, RAM's d. integral Part of the Computer System, IRQs, DMA Channels, Common I/O Addresses, COM Port 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 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. ,	4	--

	2.8 Container – picture box, frame, Option button, checkbox, command button, images. ,OLE controls , 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?	02	

	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.		

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		

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.

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.

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 **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**

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.	Dictionary	Oxford	Oxford University
3.	English at Workplace	Mukti Sanyal	Macmillan
4.	A Remedial English Grammar for Foreign Students	P.T.WOOD	Macmillan

5G302- COMMUNICATION SKILLS

COURSE STRUCTURE:

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.

COURSE CONTENTS:

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** 2.1Verbal-Nonverbal, Formal – Informal, Upward-Downward,Vertical-Horizontal-Diagonal Communication.	**02**	
03	**Principles of Effective Communication :** 3.1 Principles of effective communication 3.2 Communication 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**	
	TOTAL	**16**	

List of Experiments-

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	5	

	2) Product Cycle: Concept And Importance 3) Probable Causes Of Sickness 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

Particulars	Theory		Practical	T.W.	Oral	Total
Credits	02		--	--	--	02
	Prog. Test	End Exam				
Marks	--	--	---	50	--	50
Exam Duration	--	--	----			

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

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.
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

Contents

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

List of Practical/Assignments/Project:

1. Any five assignments on the basis of course contents.
2. A small project based on the environment/pollution/E-waste (Poster presentation/paper cutting).

Course Code: 5G305 **Course Name: INDUSTRIAL MANAGEMENT**

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 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	(07) 01 01 01	10

	• 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	 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 01	15
4	Financial Management Objectives & Functions, 4.2. Capital Generation & Management • 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	(09) 01 03 03 02	12

	• Custom Duty (Introductory approach only)		
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

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: 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, 4.5 I/O mapped I/O & Memory mapped I/O	**12**	**14**

	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: 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 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)	10	12
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	04	06

	8.3.1kruskal's algorithm.		

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 ˜ı˜ E-R Model 1.8 Client Server Architecture	11	14

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

Course Code: 5S403 **COMPUTER NETWORKS:**

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TE	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

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: 5P405
COURSE NAME: COMPUTER ARCHITECTURE AND MAINTENANCE

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80	--	25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

To handle & maintain computer systems.

To troubleshoot computer system.

RATIONALE:

Knowledge of Computer and its peripherals is essential for information technology students. Students must aware of specifications, types, varieties and vendors supplying different peripherals of computer systems. Installing and testing of these peripherals will help students to diagnosis the minor hardware problems and to rectify the same immediately. This will increase the confidence of students of handling hardware and software problems simultaneously.

COURSE OBJECTIVES: Students will be able to:

1. Understand different computers and its peripherals
2. Understand the working of peripherals.
3. Test, Connect and install the peripherals.
4. Diagnose and locate problem in computers.

CONTENTS

Chapter	Name of Topic	Hrs	Marks
01	**Fundamentals** 1.1 Chipset basic, 1.2 chipset Architecture: North / South Bridge Architecture, Hub architecture. 1.1 Architecture of Intel chipset 915 G & 945 G, 1.2 Overview and features of ISA, PCI-X, PCI-X press, AGP, PCMCIA, AGP, 1.3 Logical memory organization: Conventional memory, Extended memory, upper memory (No memory map) Concept of cache memory :Internal cache, External cache (L1, L2,L3 cache) 1.4 Overview and features of SDRAM, DDR, DDR2, DDR3 1.5 Features of Intel processors : Pentium, P2, Celeron, P3, P4, Pentium D and AMD processors : K6, Athlon XP, Athlon 64 1.6 Processor Modes : Real mode, Protected mode, Virtual real mode, 64 bit extension mode (AMD 64, EM 64), 1.7 BIOS.	16	18
02	**Storage Devices And Its Interfacing** 2.1 Recording Technique: FM, MFM, RLL Perpendicular magnetic recording,	14	16

	2.2 Terms related to Hard Disk : Track, Sector cylinder, cluster, landing zone, MBR, Zone recording, 2.3 write pre-compensation Formatting, Low level formatting, High level formatting, partitioning FAT basics, 2.4 Hard disk drive interface : features of parallel AT attachment (PATA), Serial ATA (SATA), ATA devices jumper selections :Master, slave, cable select, ATA cables ATA RAID : RAID 0, RAID 2.5 CDROM drive : Construction, 2.6 Recording DVD : Construction, Recording, 2.7 Blue-ray disk specification		
03	**Display Devices & Interfacing** 3.1 CRT color monitor : Block diagram and function of each block 3.2 Characteristics of CRT monitor : Dot pitch, Resolution, Video bandwidth, Horizontal scanning frequency, vertical scanning frequency, 3.3 LCD display monitor : functional block diagram of LCD monitor, working principal, advantages and disadvantages 3.4 Types : Passive matrix and Active matrix, I 3.5 important characteristics : Resolution, Refresh rate, Response time 3.6 Basic block diagram of a video accelerator card.	08	10
04	**Input & Output Devices** 4.1 Construction and Working Keyboard : Types of key switches : Membrane, Mechanical, Rubber dome, Capacitive and interface 4.2 Mouse : Mechanical, Opt mechanical, optical (New design) 4.3 Scanner : Flat bed, sheet feed, Handheld : Block diagram and specifications, 4.4 OCR, 4.5 TWAIN, Resolution, Interpolation 4.6 Modem : Internal and External : Block diagram and specifications 4.7 Printer : Dot matrix, Inkjet, Laser : Block diagram and specifications.	08	12
05	**Power Supplies & Interfaces** 5.1 Block diagram and working of SMPS. 5.2 Signal description and pin-out diagram of AT and ATX connectors 5.3 Power supply characteristics: Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation. 5.4 SCSI, SCSI cables and connectors, SCSI drive configuration. 5.5 USB 2.0,3.0	10	14
06	**Pc Troubleshooting, Maintenance and Tools** 6.1 Preventive Maintenance : Active, Passive, 6.2 periodic maintenance procedure 6.3 Preventive maintenance of peripherals of PCs. 6.4 Fault finding and troubleshooting of the above peripherals 6.5 ESD (Electrostatic discharge),	08	10

	6.6 RFI protection, 6.7 CRO Virus infection symptoms, 6.8 precautions to prevent a virus infection		

List of Practical (ANY 10)

1. Drawing the motherboard layout of Pentium IV and studying the chipset through data books or Internet.
2. BIOS settings of Pentium.
3. Hard Disk Partitioning.
4. Study and installation of any one display cards: VGA or SVGA display cards.
5. Installation of Scanner, Printers and Modems.
6. Fault findings: (a) Problems related to monitor.(b) Problems related to CPU.
7. Installation of Operating System.
8. Installation of CD-ROM
9. Installation of sound cards and multimedia cards
10. Dissembling of personal computer.
11. Assembling of personal computer.
12. Study of power supply.
13. Study of DDR, DDR2,DDR3 & cache memory.

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	J.V Moss	Servicing and supporting IBM PCs and compatibles	
02	Mark Minasi	The complete PC upgrade and maintenance guide	
03	Biagloo	P. C. Upgrading & Maintenance	TMH
04	B Govind Rajalu	IBM PC and Clones	TMH 2000 edition.

COURSE CODE: 5P406 **COURSE NAME: JAVA PROGRAMMING**

Particulars	Theory		Practical	Term work	Oral	Total
Credits	4		2			6
	Progressive Test	End Examination			--	150
Marks	20	80	25	25		
Duration	1 Hour	3 Hours	2 Hours	--		

COMPETENCY STATEMENT (S):

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

RATIONAL:

JAVA language enhances and refines the object oriented paradigm. Essential to adopt refinement and improvement in the art of the programming. JAVA support development of dynamic network base application, which are 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 which include learning core java forms a foundation for learning advanced java.

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
12. Understand the AWT
13. Understand the event handling
14. Understand the Servlet Programming

CONTENTS:

Chapter	Contents	Marks	Hours
	An Introduction To Java Programming **1.1**Definition of JAVA ,Getting started with JAVA , 1.2rules & Structure of JAVA ,java features, 1.3 Defining classes, creating instance & class variables, creating a		

1	classes, 1.4 Defining Objects passing arguments, passing arguments JAVA programmers, 1.5Method overloading. Constructor, constructor overloading, this keyword, Vectors, 1.6 Wrapper classes, command line arguments, garbage collector. **1.7Inheritance:** creating subclasses, single inheritance, 1.8super keyword, multilevel inheritance, hierarchical inheritance 1.9method overriding, 1.10final keyword, finalize method, abstract method & class	12	10
2	**Interface &Packages** 2.1Interface: Defining interface, 2.2Extending interface, implementing interface, accessing interface variable. 2.3Packages: creating packages, accessing packages, adding class to packages, putting classes together, 2.4creating package within a package.	10	8
3	**Multithreaded Programming & Exception Handling** 3.1creating thread, extend ding a thread class, stopping & blocking a thread, 3.2life cycle of thread, using thread method, thread exception, thread priority 3.3synchronization, implementing Runnable interface, Creating animation in JAVA, 3.4writing applets with threads. 3.5 Managing errors & Exception: wrapper classes, types of error, exception, 3.6exception handling using try-catch statements, throws	12	12
4	**Java Applet & Graphics** **4.1**Introduction to applets & application, 4.2How applets & application are different, 4.3 applet life cycle, applet tag, creating applets & parameters to applets. 4.4Working with frame windows, creating a frame window in applet, 4.5display information within a window. 4.6Creating Graphics & Colors: graphical class, lines, rectangle, circle &	12	8

Chapter	Contents	Marks	Hours
	ellipse, drawing arc, drawing & fillings text & font, creating font objects, using color objects		
5	**Introduction the Abstract Window Toolkit: (AWT)** 5.1Using AWT Controls, Layout Managers and Menus, 5.2Control Fundamentals: Window: Frame, panel, container, canvas. 5.3Components: Using Buttons, Applying Check Boxes, Checkbox Group, 5.4Choice Controls, Using Lists Managing scroll Bars, Using a Text Field, Using a Text Area, 5.5 Understanding Layout Managers Menu Bars and Menu Dialog Boxes File Dialog	12	9
6	**Event Handling** 6.1Event handling mechanism, Delegation event model, Event listeners and event classes,	10	8

	6.2 types event classes, 6.3Event handling for each component (controls- button, checkboxes, choices, textbox, and list)		
7	**Servlet** 7.1Life cycle of Servlet, how to run Servlet using Apache tomcat, 7.2 simple Servlet program. 7.3Servlet API, javax.servlet package (All interfaces and classes). 7.4Reading Servlet parameter, javax.servlet. Http package (All interfaces and classes) 7.5 Database connectivity using Servlet	12	9

LIST OF PRACTICALS (All compulsory)

Note-All the below mentioned practical should be performed in the Linux environment.

1. Write a simple java program.
2. Write a java program to demonstrate use of Classes With Objects.
3. Write a java program to demonstrate use of Subclasses.
4. Write a java program to demonstrate use of Command Line Argument.
5. Write a java program Using Method Overriding.
6. Write a java program to implement concept of threading
7. Write a java program to implement concept of Exceptional handling
8. Write a Simple Program On Applets.
9. Write a java program Using Graphics To Draw ,Fill, Use Color
12. Create Small Application For frame
13. Write a java program Using AWT (Layout and Menus, Frame, panel, container. Buttons, Checkbox Group, Choice Controls, scroll Bars, Text Field, Text Area, Dialog Boxes File Dialog.)

14. Write a java program using Event handling (controls- button, checkboxes, choices, textbox, and list)
15. Write a simple Servlet program.
16. Write a simple Servlet program for reading a Servlet parameter.

TERMWORK:

Student should submit 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
01	Patrick Naughton, Herbert Schildt	Complete reference for java	Tata McGraw Hill
02	Steven Holzner et al.	Java2 Programming (JDK 5 EDITION)	Dreamtech Press
03	E. Balaguruswami.	Programming with java	BPB
04	Keyur Shah	Java2 Programming	Tata McGraw Hill
05	John R.Hubbard	Programming with Java	Tata McGraw Hill

COURSE CODE: 5P407 COURSE NAME: OPERATING SYSTEMS

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80	---	25	25	150
Duration	1	3				

COMPETENCY STATEMENT(S):

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

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.

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:

Chapter	Contents	Marks	Hours
1	**Introduction:** 1.1Introduction to an operating system, 1.2evolution of an operating system, 1.3 generations of Operating system: 1st, 2nd, 3rd, and 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, 1.5operating 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	14	10

	management,		
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, message passing, classical IPC problem, Dining philosopher's problem, reader's writer's problem.	10	8
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, 3.3Dead Lock: Principal necessary conditions for deadlock, system modeling, mutual exclusion, 3.4Critical region, deadlock handling, deadlock resources, deadlock modeling, 3.5deadlock Detection, 3.6deadlock recovery. Banker's algorithm, deadlock prevention.	10	8
4	**File system and Memory Management:** 4.1File concept, attributes, operations, types, structure, and access methods- Sequential, direct. 4.2Directory structure- single level, two level, tree structure, Hierarchical directory system, Directory operations, file allocation methods- contiguous, linked list with indexing, I nodes Protection- Types of access, access control list,	10	8

Chapter	Contents	Marks	Hours
5	**Virtual memory management**: 5.1Background, 5.2paging and segmentation, swapping, demand paging, page table, page fault, 5.3Thrashing, 5.4page replacement algorithm (First in first out, optimal page replacement Algorithm, least recently used, most recently used Algorithm). 5.5Allocation of frames, fragmentation (Internal and External)	10	8
6	**Introduction to LINUX operating system:** 6.1Introduction to open sources, 6.2UNIX/ LINUX origins , 6.3Flavors of Linux Operating System, 6.4kernel, shell and application, role of Kernel, role of shell, types of shells, multitasking and Multi user, 6.5LINUX environment, 6.6Login in to a Linux system, 6.7virtual console and graphical environment, 6.8X- windows system, 6.9running commands and getting help.	8	8
7	**Browsing the file system:** 7.1 Linux file hierarchy concept, 7.2some important directories, 7.3current working directories, 7.4absolute and relative path name, 7.5changing and listing directives, copying and moving directories, 7.6creating and removing files and directories	10	6
8	**Commands in LINUX:** 8.1Command structure, man, cat, cal, date, passwd, less, more, wc, bc, uname, who, tty, Clear, script 8.2File and directory manipulation under LINUX: file concepts, create, copy, rename, delete and move files, ls, comm……, diff, cmp, tar, cat, cal, date, ls, passwd, less, wc, bc, uname, who, etc. archiving utilities, tarm gzip / gunzip…., create, remove, copy listening, changing and printing directory.	8	8

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. Installation of windows 2003 server, XP, Vista, 7. LINUX
2. Write & execute the program FCFS, SJF, Priority algorithm, Round robin Scheduling algorithm.
3. Write & execute the program to implement Bankers algorithm

4. Installation of LINUX operating system (Hardware and software requirement, opening disk for LINUX partition)
5. Executing of basic LINUX commands.
6. Executing of advanced LINUX commands
7. Adding new file system (Partion in Linux).
8. Running different shells in Linux.
9. Write a addition, subtraction, multiplication, division program in C Language using Linux platform.
10. Write a C program for calculation of square root value on LINUX platform.
11. Write a shell scripts to display
    a. List of files b. Process of users c. User of the system
12. Run the commands for
    a. Who? b). echo c). date d). ls, e). cal, f). dir, g). vdir, h). head, i). tail, j). touch, k). cat, l). Copy, m). Rename, n). Sleep.

REFERENCES BOOKS:

Sr.No.	Author	Title	Publisher
01	Silberschatz Galvin, Gagne	Operating system	Wiley Student Edition
02	Andrew S. Tanenbaum	Operating Systems	
03	Achyut S. Godbole, Atul Kahate	Operating Systems	Tata McGraw Hill Publication
04	Christopher Negus	Red hat Linux – A Bible	Wiley Publishing. Inc.
05	Forouzan B A, Gilbert R F	Unix And Shell Programming	Brooks Cole 1st Edition 2033
06	Richard Petersen	The Complete Reference LINUX 6th Edition	McGraw Hill Publication

COURSE CODE: 5P408 COURSE NAME: SOFTWARE TESTING

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				4
	Prog. Test	End Exam.				
Marks	20	80		25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

- 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.

RATIONALE:

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

COURSE OBJECTIVES: Students will be able to

1. Understand the impact of software bugs and importance of software testing
2. Develop the skills necessary to find bugs in any types of software.
3. Learn how to effectively plan your tests, communicate the bugs you find, and Measure your success as a software tester.
4. Discover how to improve your testing efficiency by automating your tests.

CONTENTS:

Chapter	Name of Topic	Hrs	Marks
01	**Introduction** 1.1 **Software Testing Background,** Infamous Software Error Case Studies, Intel Pentium Floating-Point Division Bug, NASA Mars Polar Lander, Patriot Missile Defense System, The Y2K (Year 2000) 1.2 Bug, What Is a Bug? Terms for Software Failures, Software Bug: A Formal Definition, Why Do Bugs Occur? The Cost of Bugs, 1.3 What Exactly Does a Software Tester Do? 1.4 What Makes a Good Software Tester? 1.5 **The Realities of Software Testing,** 1.6 Testing Axioms (introduction) , 1.7 Software Testing Terms and Definitions, 1.8 precision and Accuracy, 1.9 Verification and Validation, 1.10 Quality and Reliability Testing and Quality Assurance (QA)	08	10

02	**Black Box Testing** 2.1 Black-Box and White-Box Testing, 2.2 Static and Dynamic Testing, 2.3 Static Black-Box Testing: 2.4 Testing the Specification, Performing a High-Level Review of the Specification, Review and Test Similar Software, Low-Level Specification Test Techniques, 2.5 Dynamic Black-Box Testing: 2.6 Testing the Software While Blindfolded, Test-to-Pass and Test-to-Fail, Equivalence Partitioning, Data Testing, Boundary Conditions, Sub-Boundary Conditions, State Testing, Testing the Software's Logic Flow, Testing States to Fail, 2.7 Other Black-Box Test Techniques	10	08
03	**White Box Testing** 3.1 Static White-Box Testing: Examining the Design and Code, Formal Reviews, Peer Reviews, Walkthroughs, Inspections, 3.2 Coding Standards and Guidelines, 3.3 Generic Code Review Checklist, 3.4 Types of errors Data Reference, Data Declaration, Computation, Comparison, Control Flow, Subroutine Parameter, Input/ Output, Other Checks, 3.5 Dynamic White-Box Testing, 3.6 Dynamic White-Box Testing Versus Debugging, 3.7 Unit and Integration Testing, 3.8 Data and code coverage (introduction)	08	08
04	**Configuration Testing** 4.1 An Overview of Configuration Testing, 4.2 Isolating Configuration Bugs, 4.3 Sizing Up the Job, 4.4 Decide What Hardware Brands, Models, and Device Drivers Are Available, 4.5 Decide Which Hardware Features, Modes, and Options Are Possible, Pare Down the Identified Hardware Configurations to a Manageable Set, 4.6 Identify Your Software's Unique Features That Work with the Hardware Configurations	06	08
05	**Compatibility & Usability Testing** 5.1 Compatibility Testing Overview,	06	08

	5.2 Platform and Application Versions, 5.3 Backward and Forward Compatibility, 5.4 Tthe Impact of Testing Multiple Versions, 5.5 Standards and Guidelines, 5.6 User Interface Testing, What Makes a Good UI?, 5.7 Follows Standards and Guidelines, 5.8 Testing for the Disabled: Accessibility Testing, 5.9 Legal Requirements		
06	**Testing the Documentation** 6.1 Types of Software Documentation, 6.2 the Importance of Documentation Testing, 6.3 What to Look for When Reviewing Documentation	04	06
07	**Website Testing** 7.1 Web Page Fundamentals, 7.2 Black-Box Testing (Text, Hyperlinks, Graphics, Forms, Objects and Other Simple Miscellaneous Functionality), 7.3 Gray-Box Testing, 7.4 White-Box Testing, 7.5 Configuration and Compatibility Testing, 7.6 Usability Testing	06	08
08	**Automated Testing and Test Tools** 8.1 The Benefits of Automation and Tools, 8.2 Test Tools Viewers and Monitors, Drivers, Stubs, Stress and Load Tools, 8.3 Software Test Automation, Macro Recording and Playback, Programmed Macros, 8.4 Fully Programmable Automated Testing Tools 8.5 **Beta Testing:** Having Other People Test Your Software, Test Sharing, Beta Testing	06	10
09	**Planning Your Test Effort** 9.1 The Goal of Test Planning, 9.2 Test Phases, Test Strategy, 9.3 Resource Requirements, 9.4 Tester Assignments, Test Schedule, Test Cases, Bug Reporting, Metrics and Statistics, Risks and Issues, 9.5 The Goals of Test Case Planning, Test Design, Test Cases,	05	08

	Test Procedures 9.6 Test Case Organization and Tracking		
10	**Software Quality Assurance** 10.1 **T**esting and Quality Assurance in the Workplace, 10.2 Software Testing, Quality Assurance, 10.3 Other Names for Software Testing Groups, 10.4 Capability Maturity Model (CMM Introduction), 10.5 ISO 9000	05	06

LIST OF PRACTICAL (ANY 10):

Note-All the below mentioned practical should be performed in the Linux environment.

1. Introduction To Software Testing Concepts
2. Case Study: - Study any system specification and report bugs
3. Write Test Cases For any Application (e.g. Railway Reservation Form)
4. Display "Hello World"
5. Write a program to demonstrate use of 1) For …Loop 2) Switch … Case 3) Do…While 4) If….else
6. Automate Notepad Application.
7. Automate any installation procedure (e.g. WinZip)
8. Automate Microsoft Word Application
   1) Open Microsoft Word
   2) Type text (automatically)
   3) Generate random file name.
   4) Save file and close Microsoft Word.
9. Create GUI Objects.
10. Create any GUI Application e.g. Calculator
11. Assignment for Web Testing (use any Web testing tools e.g. Selenium)
12. Assignment for any Bug Tracking Tool (e.g. Bugzilla, Bugit)
13. Assignment for any test management tool (e.g. Test Director)
14. Assignment on software test Automation.

All above Practical may be performed on **Windows *or* Linux** Platform, using the tools mentioned below:

1. AutoIT Free Ware
2. Ruby Free Ware
3. Water Free Ware
4. Sahi Free Ware
5. Bugzilla Licensed Software
6. Test Track Licensed Software

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
1	Ron Patton	Software Testing	SAMS Techmedia
2	Ron Patton	Software Testing	Pearson 2nd edition
3	Srinivasan Desikan, Gopalaswamy Ramesh	Software Testing : Principals and Practical	Pearson Education

COURSE CODE: 5P409 COURSENAME: ADVANCED WEB DESIGING LAB

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	-	2				2
	Prog. Test	End Exam.				
Marks	-	-		50	50	100
Duration	-	-				

COMPETENCY STATEMENT (S):

1. Students will create Dynamic Web applications using Open source Technology like PHP and MYSQL Database.

RATIONALE:

This course acquires the knowledge for creating attributes for dynamic web pages & Principles. From this course contents technique for developing small to medium scale web database application that store manage & retrieve data. The principle focus of the module will be on the common ideas such as knowledge of open source technology & web based System. This will increase the confidence of student of handling open source Technology Linux, PHP Scripting Language & MySQL Database.

CONTENTS:

Unit No.	Unit Contents	Marks	hours
1	**Introduction to PHP** What is PHP, Why use PHP, PHP works, Basic Syntax, Sending data to browser, Testing script, Sending text to Browser, Adding Comments, Variables, Numbers, String, Regular Expression, Type Casting, Arrays Predefined Variables.		
2	**Control Structures** The If Conditional, else, Else if, The Switch Conditional, The While Loop, The While Loop, The For loop, Do While. Arrays: Creating Array, Adding items to an Array, Accessing array Elements, Transforming between String &Array, Creating array from a Form.		
3	**3. Reusing PHP Code** Inserting code in your script, Include files, Storing include files, Selecting up Include Directories. Function: Creating & using simple Function, Creating & Calling Function that take Arguments, Returning a value, Default argument, Function & variable scope (Global, Local variable, static variable), Static Member Function.		
4	**Object Oriented Programming with PHP** Classes & Objects, Setting Properties using $this, Adding methods, Writing The Constructor, Making properties & method private, Inheritance, Throwing & Catching, Exception, Copying Objects, Destroying Objects.		
5	**Web Based Application** Creating Simple form using GET OR POST, Receiving data from a form in PHP, Navigating web sites with multiple pages (Echoing links, using forms, Relocating Users), Moving Information from page to page (Adding information to URL, Passing information using HTML form), images uploading & storing.		

6	**Files & Directories** File permission, Writing Files File Open, File Read, File Close, Directories, Handling uploads, Remaining & Deleting Files & Directories.		

7	**Using Session Control in PHP (Cookies, HTTP Session)** Session: Basic Session Functionality, Implementing Simple session, Configuring Session Control. Cookies: The set Cookie () function, Deleting Function, Reading Cookies. HTTP: Sending HTTP Headers, Redirection, and Authentication.		
8	**PHP with JavaScript & XML** JavaScript: Outputting JavaScript with PHP, Where to use JavaScript, Dueling Objects Static verses Dynamic JavaScript, Dynamically generated forms, Passing Data back from JavaScript.XML: What is XML, Working with XML, Documents & DTD (Structure, Validating? Parsers) Simple API for XML (SAX), Document Object Model (DOM).		
9	**SQL and MYSQL** Introduction Relational Database, Data Base Terminology, MYSQL command Interpreter, Database connectivity: Connecting to MYSQL, Listing database on Server, Listing tables in Database, Creating new Database, Deleting Database, Inserting Data in to Table, Creating Record Addition form & Script, Selecting & Displaying Data, Planning & Creating Administrative Menu.		
10	**Database Driven User Authentication** Creating User Table, Adding user to table, Creating Login Form, Creating Authentication Script, Using Session: Understanding Session Variables, Managing User with Session, Putting New Information to Database, Uploading Records in the Database, Disconnecting from Database.		

LIST OF PRACTICALS: (ANY TWELVE)

Note-All the below mentioned practical should be performed in the Linux environment.

1. Creating web page using PHP basic tags.
2. Write a program to sending data to browser.
3. Crating page that explain array from a form.
4. Write a program to explain the concept of function, calling function, Returning function.
5. Write a program to explain the concept of function & variable (Global, Local).
6. Create the web page that explains the concept of classes and Objects.
7. Create a web page to explain the concept of one type of Inheritance.
8. Create the web page to explain the concept of Throwing & catching Exception.
9. Create a simple form using GET or POST.
10. Create a form how to implement the session.
11. Create a page to explain the concept of Cookies.
12. Write a Program that explains how to generate dynamically forms.
13. Create a web page that uses API for XML.
14. Write a program that creates a Database & Deleting item from database.
15. Create a dynamic web site for small scale Organization.

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 5^{th} 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: 5S411 **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: 5P412 COURSE NAME: ADVANCED MICROPROCESSORS

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	3	2				5
	Prog. Test	End Exam.				
Marks	20	80	-	25	-	125
Duration	1	3				

COMPETENCY STATEMENT (S):

- To develop programs in assembly language
- To write program to control peripherals of computer
- To understand the architecture of advanced microprocessor

RATIONALE:

Advanced microprocessors are the requirement of current market. The 8086 has certain limitations, so the microprocessor Intel 80286 was introduced with memory management, privilege & protection. The Intel 80386, 80486, Pentium are the advanced microprocessors which support multitasking, with high speed execution, enhanced instruction set, five stage pipelining architecture & incorporating parallelism. The importance of microprocessor based system design cannot be underestimated in today's world, as they are extensively used in industrial area. This subject covers the fundamental concepts of advanced microprocessors and their architectures. This will enable students to write efficient programs in assembly language. It covers the interesting programming & application part of microprocessors.

COURSE OBJECTIVES: Student will be able to

1. Explain architecture and memory management of 80286.
2. Explain concepts of multitasking
3. Know architecture and memory management of 80386.
4. State the concept of paging
5. Describe features and architecture of 80486, Pentium.
6. Programming in assembly using different functions of DOS & BIOS interrupts.

COURSE CONTENTS

Chapter	Contents	Marks	Hours
1	**16-bit Microprocessor - Intel 80286** 1.1Salient features, Internal architecture, Register organization (General purpose register, Segment register, status and control register, instruction pointer, segment descriptor cache register), 1.2 Addressing mode such as Real, Protected Virtual Addressing mode, Selector, Descriptors and its types, 1.3LDT, GDT, IDT, privilege protections. 1.4Operations of 80286 in Real and PVAM.	**22**	**12**
	32-bit Microprocessor –Intel 80386 2.1Salient features, internal architecture,		

2	2.2 Register organization (General-purpose register, segment register, status and control register, instruction pointer. 2.3Segment descriptor cache register, System address register LDTR & GDTR, TR, Debug register, Test registers, Control register, 2.4Addressing modes of 80386, real, PVAM, paging, 2.5virtual 8086, 2.6 Address translation in real, PVAM, paging, Enabling and disabling paging (Machine Status word)	**23**	**12**
3	**Interrupts of X86 microprocessor** 3.1Introduction to X86 interrupts (Hardware, software and exceptions), 3.2Interrupt vector table, Interrupt processing sequence. 3.3Hardware or exception interrupts (Singles step, divide by zero/overflow, non-maskable, breakpoint, overflow) 3.4software interrupts (INT, INTO instructions), 3.5 Introduction to MS-DOS, The structure of MS-DOS (BIOS Module, DOS kernel, command processor), 3.6Loading of MS-DOS introduction to *.com* and *.exe* programs, DOS & BIOS Interface, Interrupt Services, DOS& BIOS Interrupts.	**22**	**14**
4	**Advanced Microprocessors (Intel 486 & Pentium)** 4.1Salient features of 486, 4.2Salient features of Pentium, System architecture (Super-scalar Execution, Separate code & data cache, Floating Point Exceptions, Branch prediction	**13**	**10**

LIST OF PRACTICALS (ANY 10)

1. Write an assignment on keyboard and display function 01H., 02H, 08H, 09H, 0AH of DOS INT 21H and program to read password & validate the user.
2. Write an assignment on keyboard functions 02H of BIOS INT 16H (Get Keyboard Flags) and program to display the status of keys described in 02H functions of BIOS INT 16H.
3. Write an assignment on screen functions 06H (Scroll screen up), 07H (Scroll screen down) of BIOS INT 10H and program to simulate CLS (Clear Screen) command.
4. Write an assignment on ASCIIZ string, file handle, file functions 41H (delete file), 56H (Rename file) of DOS INT 21H and program to simulate DEL (Delete file) and REN (Rename file) command.
5. Write an assignment on file functions 43H (Set/Get file attribute) and 57H (Set/Get file Time & date) of DOS INT 21H and program to display the attribute and date/ time of any file.
6. Write an assignment on directory functions 39H (Create directory), 3AH (Delete directory) of DOS INT 21H and program to simulate MD (Make directory), RD (Remove Directory) commands.
7. Write an assignment on directory functions 3BH (Change Directory), 47H (Get current directory) of DOS INT 21Hand program to simulate CD (Change directory) and PWD (Present Working Directory) commands.
8. Write an assignment on Disk Storage Organization i.e. track, sector, cylinder, cluster, disk system area, data area and disk processing functions 02H(Read Sector), 03H (Write sector) of BIOS INT 13H.
9. Write a program to read any sector from floppy and display the contents of that sector on the screen.

10. Write an assignment on Printer Control Characters i.e. Horizontal TAB, Line Feed, Form Feed, Carriage Return, Printer function 40H, 05H of DOS INT 21 H and 00H (Print character) of BIOS INT 17H and program to print ASCII character set on printer.
11. Write a program to display the status of Flag register and Machine Status Word register of 286 on the screen.
12. Write a program to display the status of Flag register and Machine Status Word register of 386 on the screen.

1. REFERENCE BOOKS:

Sr.No.	Author	Title	Publisher
01	Peter Abel	IBM-PC assembly language & programming	Prentice Hall India
02	A. K. Ray. K. M. Bhurchandi	Advanced microprocessor & peripheral	TATA McGraw Hill
03	Ray Duncan	Advanced MS. DOS Programming	BPB Publication

COURSE CODE: 5P413
COURSE NAME: PROFESSIONAL ETHICS AND CYBER SECURITIES

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	3	-				3
Marks	Prog. Test	End Exam.	--	-	-	100
	20	80				
Duration	1	3				

COMPETENCY:

- To use computer, system software, applications software as per laws and license of agreements
- To develop awareness of computer ethics.

RATIONALE STATEMENT (S) :

This course will help students to understand moral, ethical and legal issues related to computers and its use. Students should aware laws about software licensing issues, penalties and offences and crimes related to computer. This will help the students to develop social ethics, business ethics. This will help to understand what to do and what not to do while working on computer systems.

COURSE OBJECTIVES:

- Understand moral and legal issues
- To know the linkage between computer, professional , philosophical ethics and decision making
- Understand cyber crime and system forensics
- Aware of penalties and offences under the IT act 2000
- To give emphasis on how cyber security operations are carried out

CONTENTS

Chapter	Name of Topic	Hrs	Marks
01	**Computer Ethics** 1.1 Philosophical ethics: Introduction, New possibilities and a vacuum of policies, Filling the vacuum, clarifying conceptual muddies, Computers used in a social context, 1.2 Moral and legal issues, 1.3 Professional Ethics: Characteristics, the system of professions, computing as a profession, 1.4 professional relationships, responsibilities, code of ethics and professional conduct, 1.5 Privacy: Computers and privacy issue, reframing this issue, 1.6 legislative background, better privacy protection.	06	10
02	**Intellectual property issues in cyberspace** 2.1 Introduction to intellectual property 2.2 Protections via Copyright, Trade Secrets, Trademarks, Patents, Contracting to protect intellectual property, 2.3 Protection options – Encryption, copyright on web content, copyright on software. 2.4 Ethical Decision Making: Types of ethical choices, Making defensible decisions,	04	08

	2.5 Ethical dilemmas, 2.6 law and ethics, 2.7 Guidelines for dilemma (Informal and Formal).		
03	**IT Act 2000** 3.1 Information Technology Act 2000- Scope, jurisdiction, offense and contraventions, powers of police, 3.2 adjudication, Tampering with computer source documents, Hacking, Publishing of information which is obscene in electronic form, 3.3 failure to comply with directions of controller, Failure to assist in decryption, 3.4 Accessing protected system, Misrepresentation, 3.5 Penalty for breach of confidentiality and privacy, 3.6 Publishing digital signature certificate false in certain particulars, 3.7 Publishing digital signature certificate for fraudulent purpose 3.8 Surrender of license.	08	12
04	**Cyber crime and the IPC** 4.1 Cyber crime examples, 4.2 investigative incident response actions, 4.3 Offences by or relating to public servants 4.4 Absconding to avoid service of summons to produce electronic record, 4.5 Preventing service of summons or preventing publication of summons, 4.6 Intentional omission to produce electronic record, Fabricating false electronic evidence, destroying of electronic record to prevent its production as evidence, 4.7 Extortion, Forgoing of certain records, Forgery for the purpose of cheating, Forgery for the purpose of defamation	10	12
05	**Digital evidence and Indian evidence Act** 5.1 Digital evidence and Indian evidence Act, 5.2 Definition of evidence, Definition of admission, Oral admissions, 5.3 Extent of relevancy of entries made in account books, entries in public record, 5.4 Proving a part of a statement, Relevance of opinions of third parties, Oral evidence, Provisions for evidence relating to electronic records, Prof in case of digital signatures, Verifying a digital signature 5.5 Presumption by courts, Presumption relating to electronic agreements, 5.6 electronic records, Presumption as to electronic messages,	08	10
06	**System forensics & cyber crime incident Handling Basics** 6.1 System forensics and crime, introduction to System	08	10

	forensics, 6.2 Importance of System forensics, Forensics methodology, 6.3 System forensics process, Identification of data, collection of data, Presentation of data. 6.4 Hacking, cyber activism, tracking hackers, 6.5 clues to cyber crime, privacy act, search warrants, common terms, organizational roles, 6.6 procedure for responding to incidents, 6.7 reporting procedures		
07	**Security Policies** 7.1 Sample Policy Documents: i) Antivirus Guidelines Policy ii) Internal Lab Security Policy iii) Server Security Policy iv) Wireless Communications Policy, 7.2 Information Security Certifications, CISSP and SSCP, CISA and CISM, SCP, GIAC, 7.3 Certification weaknesses, 7.4 Role of these certified professionals.	04	08

Reference Books:

Sr. No.	Author	Title	Publisher
01	William M. Hancock	*Cyber security Operations Handbook*	Elsevier Pub.
02	J.P Grillo, Earnest A. Kallman	"*Ethical Decision making and IT: An Introduction with Cases",*	McGraw Hill
03	D G Johnson	Computer Ethics	Pearson Education
04	NIIT PHI	Understanding Forensics in IT	PHI of India
05	NIIT PHI	Cyber crime and digital evidence	PHI of India

COURSE CODE: 5P414 COURSE NAME: MOBILE COMPUTING

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80	--	25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

- Students will learn operation of different mobile technologies
- Understand mobile communication systems

RATIONAL:

The glorious 21st century marks the mobile radio communication industry by orders of magnitude. The recent exponential growth in cellular mobile communication needs more skilled technicians for operation, maintenance & servicing of mobile cellular system. This subject is classified under technology group and it is based on communication theory, which gives theoretical as well as practical knowledge of different cellular system. It covers digital cellular mobile system. It covers digital cellular mobile system such as GSM, IS – 95 standards, WLL, call processing & basic of mobile communication system.

COURSE OBJECTIVES: Student will be able to,

1. Compare operation of different mobile communication system
2. Describe cellular concept such as frequency reuse, hand off
3. Describe coverage & capacity in cellular system
4. Draw GSM system architecture
5. Explain call processing in GSM
6. Explain CDMA (IS-95) standards
7. Explain Call processing in CDMA
8. Compare GSM & CDMA
9. Define SS7 services
10. Demonstrate GSM system & CDMA system

CONTENTS :

Chapter	Name of Topic	Hrs	Marks
01	**Introduction to wireless communication system and mobile network Architecture** 1.1 Evolution of mobile radio communication, 1.2 Mobile radio system around the world-(Such as AMPS, N-AMPS, IS-95, GSM), Related definition base station, control Channel, forward channel etc. 1.3 how cellular telephone call is made, 1.4 Principles of cellular communication, 1.5 overview of 1G, 2G, 3G,4G and 5G technologies	12	16

	1.6 Mobile Devices –PDA and mobile OS, Palm Os, Win CE and Symbian, BADA, Android.		
02	**Mobile unit** 2.1 Block Diagram and operation of mobile unit, 2.2 Block Diagram & Explanation frequency Synthesizer, 2.3 Block diagram and operation of transmitter, receiver, logic unit, control unit & handset	08	10
03	**The cellular concept**. 3.1 Introduction a basic cellular system, 3.2 Hand off, Type of hand off, hard hand off, soft hand off, Handoff management, 3.3 GSM architecture and mobility management Roaming Management.	08	12
04	**Wireless Application Protocol (WAP)** 4.1 The Wireless Application Protocol application environment, 4.2 wireless application protocol Client software, 4.3 hardware and websites, wireless application protocol gateways, 4.4 Implementing enterprise wireless application protocol strategy.	08	12
05	**Mobile IP protocol architecture** 5.1 Mobile IP and IPV6 and it's applications in mobile computing, 5.2 cellular digital packet data CDPD, VIOP, GPRS services, 5.3 Wireless local loop-WLL system	10	12
06	**Wireless Markup Language** 6.1 An introduction to WML, 6.2 Markup languages, 6.3 fundamentals of WML, 6.4 WML script	08	08
07	**Wireless Markup Language Script** 7.1 An Introduction to WML Script, 7.2 WML Script Control Structures, 7.3 Events, Phone.com Extensions, 7.4 Usability, 7.5 Application of Mobile computing**:** ASP and Dynamic WAP Sites	10	10

LIST OF PRACTICAL: (ANY TEN)

1. Find out different add- on accessories for cell phones (battery, charger, hands free data cable)
2. Identify different sections & component of mobile unit such as (Ringer section, dialer section, receiver section etc.
3. Study of handoff, frequency response, cell splitting.
4. Prepare report on different facilities provided by cellular company
5. Prepare report on cellophane operator companies and their plan & traffic. (Visit) memory charging time, Facilities: - STD, ISD & LIP)
6. Prepare report on GSM technology, its network, GSM capability & data Services.
7. Study & prepare report on cell site , distance coverage , antennas used & other components.
8. Study of GSM Mobile systems (Airtel , BSNL)
9. Study of CDMA mobile station (TATA Indicom , Reliance)
10. Prepare report on features, services provided by different companies.
11. Study of WML and WML script.

REFERENCE BOOKS

Sr. No.	Author	Title	Publisher
1	John Wiley	Wireless and mobile networks architecture	
2	Wrox,Wrox Publication	The beginning of WML and WML sript	
3	Tomasz Imielinski et al, Kluwer academic press 2006	Mobile Computing	

Teaching Scheme		Evaluation Scheme						
TH	04		PT	TEE	TW	PR	OR	Total
PR	02	Max.Marks	20	80	25	--	25	100
TOTAL	06	Duration	1 Hr	3 Hrs	--	--	--	--

Course Code: 5P415 COURSE NAME: Data Mining & Warehousing

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 STATEMENTS:

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.
5.

COURSE CONTENTS:-

	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, 1.2 History of DSS, 1.3 Data and Model Management,	10	12

	1.4 User Interfaces, 1.5 The DSS Users, 1.6 Categories and Classes of DSSs Need for data warehousing, **1.7** Operational & Informational data, Data Warehouse definition and characteristics, Operational Data Stores.		
2	**Data Warehouse Components** 2.1 Overall Architecture, 2.2 Data warehouse database, 2.3 Sourcing, acquisition, cleanup, and transformation tools, 2.4 Metadata, Data Marts, 2.5 Data warehouse administration and management, 2.6 Information delivery system, 2.7 Design Considerations, Data Content	10	14
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 Multidimensional Data Model, 3.4 Need for OLAP, OLAP tools , 3.5 Mining Multimedia Databases, 3.6Mining Text Databases, 3.7 Mining the World Wide Web, 3.8 Multidimensional Vs Multirelational OLAP, 3.9 Categorization of OLAP tools.	12	14
4	**Data Mining Algorithms** a. Concept Description: What is Concept Description? b. Data Generalization and Summarization Based Characterization, c. Mining Descriptive Statistical Measures in Large Databases. Mining Association Rules: Association Rule Mining, d. Market Basket Analysis, e. Association Rule classification, f. The Apriori Algorithm, g. Mining Multilevel Association Rules, Constraint Based Association Mining, Sequential mining.	12	12
5	**Classifications and Prediction** 5.1 What is Classification and Prediction? 5.2 Data Classification Process, 5.3 Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, 5.4 Classification Based on Association Rule Mining, 5.5 Other Classification Methods, 5.6 Categorization of Clustering Methods. 5.7 Introduction to Knowledge Discovery, 5.8 Innovative techniques for knowledge discovery, 5.9 Application of those techniques to practical tasks in areas such as fraud detection, scientific data analysis, and web mining.	12	16
6	**Cluster Analysis**		

	6.1 What is Cluster Analysis? 6.2 Types of data in Cluster Analysis: 6.2.1 Interval-Scaled Variables, 6.2.2 Binary variables, 6.2.3 Categorical, 6.2.4 Ordinal, 6.2.5 Ratio-Scaled Variables, 6.2.6 Variables of Mixed Types, 6.3 Vector Objects , 6.4 Partitioning Methods: 6.4.1 Classical Partitioning Methods: *k*-Means and *k*-Medoids,	08	12

LIST OF EXPERIMENTS:

1. Evolution of data management technologies, Introduction to data warehousing concepts.
2. Assignment on design of fact and Dimension tables, data marts.
3. Assignment on OLAP, Rollup, Drilldown, Slice, and Dice operations.
4. Assignment on multidimensional data.
5. Assignment on data generalization and summarization techniques.
6. Assignment on Introduction to Data Mining Techniques.
7. Assignment on Decision Tree algorithm.
8. Assignment on Naïve Bayesian classifier.
9. Assignment on Association Rule Classification.
10. Assignment on object oriented databases.
11. Assignment on Cluster Analysis.

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	Data Warehousing Fundamentals	Paul Punnian	
2	Data Mining Concepts and Techniques	Han, Kamber	TMH
3	Data Warehousing, Data Mining and	Alex Berson	

	OLAP		

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 Hour	3 Hours	-	-	2 Hours	-

4	Data Mining: Concepts and Techniques	Margaret Dunham	

Course Code: 5P416
Course Name: ADVANCED DATABASE MANAGEMENT SYSTEM (ADBMS)

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 1.3Transaction state	10	12

	1.4Transaction and System Concept 1.5 Desirable properties of Transactions 1.6 Scheduling and Recoverability 1.7Serializability of Scheduling 1.8 Transaction Support in SQL		
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 2.4Deadlock handling.	10	12
3	**Recovery System** 3.1Failure classification 3.2Storage structure 3.3Recovery and atomicity 3.4log-based recovery 3.5Recovery with concurrent transactions.	08	10
4	**Object –Oriented Databases** 4.1New Database Applications 4.2The Object-Oriented Data Model 4.2.1Object Structure 4.2.2Object Classes 4.2.3Inheritance 4.2.4Object Identity 4.2.5Object Containment 4.3Object-Oriented Languages And Persistent Programming Languages.	10	12
5	**Parallel Databases** 5.1Introduction 5.2I/O Parallelism 5.2.1Interquery Parallelism 5.2.2Intraquery Parallelism 5.3Intraoperation Parallelism 5.4Interoperation Parallelism 5.5Design of Parallel System.	08	12
6	**Distributed Databases** 6.1Distributed Data Storage 6.2Distributed Query Processing 6.3Distributed Transaction Model 6.4Coordinator Selection 6.5Deadlock Handling 6.6 Multidatabase System.	08	12
	Database Security	10	10

7	7.1Introduction to Database Security Issues 7.2Types of Security 7.3Control Measures 7.4Database Security and the DBA 7.5Introduction to Statistical Database Security 7.6Introduction to Flow Control 7.7Privacy Issues and Preservation, 7.8Challenges of Database Security.		

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: 5P417 COURSE NAME: Digital Image Processing

Particulars	Theory		Practical	Term work	Oral	Total
Credits	**4**		**2**			**6**
	Progressive Test	End Examination			**25**	**150**
Marks	**20**	**80**	**-**	**25**		
Duration	**1 Hour**	**3 Hours**	**2 Hours**	--		

COMPETENCY STATEMENT (S):

1. To understand basic concept of Digital Image Processing
2. To use computer for Image processing based application.
3. To prepare professional project

RATIONAL:

Digital Image Processing is fastest growing field in computer age, Digital Image Processing mostly used in real time , also used in research field, the knowledge of Image its type working on different image , processing on images, solving the many problems like noise converting the pixels is major task of Digital Image Processing. To introduce the various image processing techniques and their applications in different domains. To get students acquainted with computer vision.

COURSE OBJECTIVES:

After study this subject, the student will be able to

Understand the Images and its role
Understand the representation of Images.
Differentiate between Image sampling and Quantization , color image
Understand Image transformation
Understand Filtering.
Working on Image restoration.
Mange Noise of Image
Understand Image Compression and its different types of coding.
Understand the Image properties.

Contents:-

Chapters	Contents	Marks	Hours
1	**Introduction to Image Processing:** 1.1Digital Image representation, Sampling & Quantization, 1.2Steps in image Processing, Image acquisition, color image representation, 1.3 What is digital image processing? 1.4Origin, usage and application of image processing. 1.5Fundamental steps and component of image processing system. 1.6Introduction to Human Visual System. 1.7 Digital representation of images (monochrome & color).	12	9
2	**Image Transformation & Filtering:** 2.1Intensity transform functions, 2.2histogram processing, spatial filtering, Fourier transforms and its properties, frequency domain filters, Homomorphic Filtering, color models, Pseudo coloring, color transforms, Image Processing filters, Image Segmentation & Analysis, 2.3 Implementation Feature extractions: Edges, Lines & corners detection, Texture & shape measures. 2.4Segmentation & Thresholding, region extraction, edge (Canny) & region based approach, use of motion in segmentation. 2.5Feature extraction Edges, Lines & corners detection, Texture & shape measures.	16	14
3	**Image Restoration:** 3.1Image degradation and restoration process, 3.2Noise Models, Noise Filters, degradation function, Inverse Filtering reduction, 3.3Model of Image degradation, Noise Models, Classification of image restoration techniques, Blind-**deconvolution** techniques, Lucy Richardson Filtering, Wiener Filtering	14	12
4	**Image Compression:** 4.1Coding redundancy, Interpixel redundancy, Psycho visual redundancy, Huffman Coding, Arithmetic coding, Lossy compression techniques, JPEG 4.2Compression Introduction to Image Compression and its need, Coding Redundancy, 4.3Classification of Compression Techniques (Lossy and Lossless - JPEG, RLE, Huffman, Shannon fano), 4.4Scalar & Vector Quantization. 4.5Introduction to Object Recognition, Object Representation (Signatures, Boundary Skeleton), Simple Boundary Descriptors, Regional descriptors (Texture).	18	13
5	**Image Segmentation & Representation:** 5.1Point, Line and Edge Detection, 5.2Thresholding, Edge and Boundary linking, 5.3Hough transforms, Region Based Segmentation, Boundary representation, Boundary Descriptors, 5.4 Regional Descriptors	10	8
6	**Object Recognition:** 6.1Patterns and Patterns classes, 6.2Recognition based on Decision Theoretic methods	10	8

Practical:

Note: Students are required to complete the entire practical by implementing them in any of the programming Language such as Java, C/C++, C#, MATLAB

1. Reading and displaying images in different formats using different color models.
2. Converting color images into monochrome images, Image color enhancements using pseudo Coloring Techniques.
3. Images enhancements using grey level transformations and spatial and frequency domain filters
5. Image Noise removal and inverse filtering of images
6. Point, Line, Edge and Boundary Detections in images
7. Histogram Matching and specification on images
8. Boundary Linking, Representation and Description techniques on images
9. Thresholding & Magnification of Images
10. Image Morphological Operations
11. Object Recognition Techniques

Sr.No.	Author	Title	Publisher
01	Gonzalez and Woods	Digital Image Processing ISDN 0-201-600- 781	Addison Wesley 1992.
02	Boyle and Thomas:	Computer Vision - A First Gurse 2nd Edition, ISBN 0-632-028-67X,	Blackwell Science 199542
03	Trucco & Verri:	Introductory Techniques for 3-D Computer Vision,	Prentice Hall, Latest Edition
04	. Sonka, Hlavac, Boyle	Image –Processing and Computer Vision First ed. ISBN 978813150557, Cengage	Learning, 2011

COURSE CODE: 5P501 COURSE TITLE: Embedded Systems

Particulars	Theory		Practical	Term work	Oral	Total
Credits	**4**		**2**			**6**
	Progressive Test	End Examination			-	**150**
Marks	**20**	**80**	**25**	**25**		
Duration	**1 Hour**	**3 Hours**	**2 Hours**	--		

COMPETENCY:
To understand Microcontroller architecture & its interfacing to design dedicated applications.

RATIONALE:
Embedded systems using MCS-51 family of micro controllers are increasingly used now a days almost in all applications. Hence it is essential to understand basics of embedded systems & also learn to design them.

OBJECTIVES:
This course contains basics of embedded systems, memory organization, architecture of 8051 microcontroller, its programming and few applications based on it.

CONTENTS:

Chapter	Name of Topic	Hrs	Marks
01	**8051 Microcontroller** 1.1 Introduction, Comparison with Microprocessor, 1.2 Evolution of Microcontroller, Microcontroller and embedded systems, 1.3 Microcontroller selection criteria, 1.4 Architecture and Block Diagram of 8051, 1.5 Flag bits and PSW, ROM memory space allocation, RAM memory space allocation, 1.6 Pin diagram of 8051, 1.7 Addressing modes, 1.8 Memory organization of 8051.	12	12
02	**8051 Programming in C** 2.1 Bit Addresses of I/O and RAM, 2.2 Data types in 8051 C, 2.3 Time delay in 8051 C, 2.4 I/O programming, Logic operations, 2.5 Data conversion, 2.6 Accessing Code ROM Space, 2.7 Data Serialization, 2.8 Registers for Timer Programming, 2.9 Modes of Timers, 2.10 Counter Programming, 2.11 Programming Timers of 8051.	12	14

03	**Serial Communication and Interrupt Programming** 3.1 Basics of Serial Communication, 3.2 Registers of 8051 used for Serial Communication, 3.3 Programming 8051 for receiving and transmitting serial data, 3.4 8051 Interrupts, Programming Timer Interrupts, Programming External Hardware Interrupts, Programming serial communication interrupt, 3.5 Interrupt priority in 8051.	14	18
04	**Interfacing of 8051** 4.1 LCD Interfacing, 4.2 Keyboard Interfacing, 4.3 ADC 0804 and 0808/09 Interfacing, 4.4 DAC 0808 interfacing, 4.5 Interfacing and Accessing External data memory, 4.6 Stepper motor interfacing using 8255, RTC Interfacing, 4.7 DC Motor control and PWM.	12	18
05	**Real Time Operating Systems** 5.1 Real Time Operating System Concept, 5.2 Architecture of kernel, 5.3 Schedule management, Task scheduler, 5.4 Interrupt routines, Semaphores, Mailbox, Message queues, Pipes, Events, Timers, 5.5 Memory management, 5.6 RTOS services in contrast with traditional OS, 5.7 Overview of commercial RTOS like Vxworks, RT Linux, µcos, QNX.	14	18

Text/ Reference Books:

Sr. No.	Author	Title	Publisher
1	Mazidi	The 8051 Microcontroller and Embedded Systems Using Assembly and C	PHI
2	Rajkamal	Embedded Systems	TMH
3	Frank Vahid	Embedded System Design",	PHI
4	Mazidi	The 8051 Microcontroller and Embedded Systems	PHI
5	Kenneth J. Ayala	The 8051 Microcontroller	PHI

Practical Examination:

1. Program for different C data types for 8051.

2. Program for time delay generation using loop and timer of 8051.
3. Program for I/O programming using byte sized data and bit addressable I/O.
4. Program for Accessing SFR registers of 8051.
5. Program for logical operations in 8051 using C.
6. Program for data serialization using 8051 C.
7. Program for data conversion (ASCII to BCD, BIN to ASCII, HEX to ASCII).
8. Program for Interfacing of ADC.
9. Program for Interfacing of LED.
10. Program for Interfacing of stepper motor.

COURSE CODE:- 5P502 **COURSE NAME: COMPUTER SECURITY**

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	3	2				5
	Prog. Test	End Exam.				
Marks	20	80	--	25	25	150
Exam Duration	1	3				

COMPETENCY STATEMENT(S):

I. Student will understand the different security implementations in computer networks and over internet
II. Understand cryptography algorithms
III. Aware about ethics in using computer over internet
IV. Aware about secured websites
V. Aware using financial transactions and its security mechanisms

RATIONAL:

Computer security is 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.

COURSE OBJECTIVES:

After studying this course, the student 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.

CONTENTS:

Chapter	Name of Topic	Hrs	Marks
01	**Introduction and Security trends** 1.1 Need for security,	06	10

	1.2 Threats to security: Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare, 1.3 Security Basics – Confidentiality, Integrity, Availability, 1.4 Operational model of Computer Security, Layers of security, 1.5 Access control: Discretionary, Mandatory, 1.6 Role based Authentication: Certificates Tokens, Multifactor		
02	**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, 2.2 Individual user Responsibilities, 2.3 Security policies, Standards, procedures and guidelines, 2.4 Physical security: Access controls, Biometrics: finger prints, hand prints, Retina, patterns, Voice patterns, signature and writing patterns, keystrokes, Physical barriers, Social Engineering.	11	14
03	**Cryptography and Public key Infrastructure** 3.1 Encryption algorithm/Cipher, 3.2 Caesar's cipher, 3.3 RSA algorithm, 3.4 Hashing, SHA, 3.5 Symmetric encryption, DES (Data encryption standard), Asymmetric encryption, 3.6 Digital signatures, Key escrow, 3.7 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, 3.8 private key protection, 3.9 Trust models: Hierarchical, peer to peer, hybrid	11	16
04	**Network Security** 4.1 Firewalls: working, design principles, 4.2 trusted systems, Kerberos 4.3 Security topologies – security zones, DMS, Internet, VLAN, security implication, tunneling, 4.4 IP security, Architecture, authentication header, 4.5 Virtual Private Network, 4.6 Email security: security of email transmission, malicious code, spam, mail encryption	08	14
05	**System Security** 5.1 Intruders, Intrusion detection systems (IDS),	06	12

	5.2 host based IDS, 5.3 network based IDS 5.4 Password Management, vulnerability of password, password selection strategies, components of a good password, 5.5 Operating system security: Operating system updates : hot fix, patch, service pack		
06	**Application and Web Security** 6.1 Application hardening, application patches, 6.2 web servers, active directory, Web security threats, web traffic security approaches, 6.3 secure socket layer and transport layer security, secure electronic transaction, 6.4 Software development: secure code techniques, buffer overflows, code injection, least privilege, good practices, requirements, testing	06	14

TERMWORK / PRACTICAL:

1. Study of any Antivirus Installation & Configurations.
2. Study the risks faced by Computer Systems and the nature of common Information hazards.
3. Study types of attacks.
4. Different methods of finding IP address of any system.
5. Write a program for encryption and decryption.
6. Write program for RSA algorithm.
7. Study of setting firewall with Windows XP, its importance and Problems.
8. Study of different techniques for authentication, like use of biometrics
9. Study of security measures in different operating Systems.
10. Web security threats.

REFERENCES BOOKS:

Sr. No.	Author	Title	Publisher
1	William Stallings	Cryptography and Network Security Principles and Practices	Pearson Education, Third Edition
2	Atul Kahate	Cryptography and Network Security	Tata-McGraw-Hill Sixth reprint 2006

3	Dieter Gollman	Computer Security	Wiley India Education, Second Edition
4	Wm.Arthur Conkin, Dwayne Williams, Gregory B. White, Chuck Cothren Roger L. Davis	Principles of Computer security Security+and Beyond	McGraw-Hill Technology Education, International Edition 2005
5	Debby Russell G.T.Gangmi,sr.	Computer Security Basics	O'Reilly Publication

COURSE CODE: 5P503 COURSE NAME: SOFTWARE ENGINEERING & PROJECT MANAGEMENT

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	0				4
	Prog. Test	End Exam.				
Marks	20	80		25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

Students will develop software as per engineering and scientific approach.

1. Explain the techniques used in software process, Analyze the phases of software Engg.
2. Outline the role of software evolution & its characteristics
3. Summarize project management process
4. Discuss project-planning objectives
5. Explain software cost estimation
6. Explain software design principles
7. Study the concepts for testing process

RATIONALE:

This course introduces the engineering approach for analysis, design, testing, implementing any computerized system. Every IT professional should know from basic to advance techniques of software development. Develop software will be tested and estimated scientifically to ensure the quality of the software.

COURSE OBJECTIVES: Students will be able to

1. Understand the concepts of the methods used in the development of software
2. Understand engineering approach for software design
3. Plan and manage the software development activity
4. Understanding costing and scheduling methods of software
5. Appreciate the responsibilities of team members
6. Understand the system design
7. Know the concepts involved in coding
8. Understand the working of the team management vertically & horizontally.

CONTENTS:

Chapter	Name of Topic	Hrs	Marks
01	**Software Engineering** 1.1 Introduction Software & Software Engineering**,** 1.2 Evolving Role of software, characteristics, components & Applications, Definition of software Engg. 1.3 Phases of software Engg- Requirement, analysis, Software design, coding, Testing, Maintenance, 1.4 Effort distribution with phases, 1.5 S/W crisis, S/W myths, 1.6 Introduction to re-engineering and reverse engineering	06	08

02	**Different approaches to software** 2.1 Software process, 2.2 software process model, 2.3 Linear sequential model, 2.4 proto typing model, 2.5 Evolutionary software process model, 2.6 the incremental model, 2.7 Spiral model, 2.8 4GT	08	08
03	**System Engineering** 3.1 Definition of system, element of the system, characteristic of the system, system development life cycle, 3.2 Functions and role of system analyst. System analysis, requirement analysis, system requirement specifications, feasibility study, project goals, examining alternative solutions, evaluation of proposed solutions, cost benefit analysis, 3.3 Feasibility report. 3.4 System design & implementation, 3.5 structure tools for system design, DFD, data dictionary, decision tree, decision tables, structure English, case tools	10	12
04	**Software Design & Testing** 4.1 Design process, 4.2 design principles, design concepts, 4.3 s/w architecture- definition & importance, user interface design, golden rules of UI design, 4.4 Software testing- Testing fundamental, testing objectives, testing principles, testability, 4.5 white box testing, basis path testing, 4.6 Black box testing, 4.7 gray box testing, 4.8 Testing for specialized environments, architecture & applications.	10	12
05	**Project Management** 5.1 The management spectrum: The People: Stakeholders, Team Leaders, Software Team , 5.2 Co-Ordination & Communication Issues. 5.3 The Product: Software Scope, People Decomposition. 5.4 The Process: Melding the Product & Process, Process Decomposition. 5.5 The Project: W^5HH Principle, Critical Practices.	08	10
06	**Software project planning** 6.1 Project planning objectives, software scope resources, 6.2 s/w project estimation, 6.3 Decomposition techniques – s/w sizing, problem based estimation, example of LOC and FP based estimation, process based estimation, 6.4 empirical estimation models, structure of estimation model, the COCOMO model,	08	10

	6.5 S/w equation, automated estimation tools.		
07	**Managing Software Project** 7.1 Software scope, problem decomposition, 7.2 software process & project metrics-major metrics and indicators, 7.3 Software measurements, size oriented metrics, function oriented metrics, extended function point metrics, metrics for software quality, 7.4 Measuring quality, defect removal efficiency.	06	08
08	**Project Scheduling & Risk Management** 8.1 Basic concepts: Project Scheduling, Basic Principles, Relationship between People & Effort, 8.2 Defining a task set for software project, degree of rigor, 8.3 Selecting s/w engineering tasks, time line charts, tracking the schedule, defining a task network. 8.4 Earned value analysis, Reactive Vs Proactive 8.5 Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinement	04	06
09	**Quality Management** 9.1 Quality Concepts: Quality, Quality Control, Quality Assurance, Cost of Quality. Software Quality Assurance, 9.2 Software Reviews, Statistical Software Quality Assurance, A generic example, 9.3 Six Sigma for Software Engineering, 9.4 Standard ISO 9000.	04	06

Assignments:

All are compulsory.

1. Write an assignment on SDLC.

2. Write the implementation SDLC on your diploma project.

3. Write an assignment on DFD of your diploma project.

4. Write an assignment on software testing of your diploma project.

5. Write an assignment on calculating efforts of your diploma project.

6. Write an assignment on risk management.

7. Write an assignment on quality assurance.

8. Write an assignment on six sigma technology.

9. Write an assignment on stakeholders of your diploma project.

10. Write an assignment on COCOMO model.

Oral- Based on the assignments & syllabus.

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	Roger Pressman	Software Engg	practionar's approach McGraw Hill fourth/Fifth edition – Roger Pressman
02	Elias Awad	System Analysis & Design	
03	Senn	Analysis & Design of Information System	
04	Ian Sommerville	Software Engineering	
05	Jolate	An Integrated approach to software	

COURSE CODE: 5P504 COURSE NAME: MULTIMEDIA & ANIMATION

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80		25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

1. Student will create multimedia presentations and applications
2. Will create multimedia animations
3. Handle different type of media files and their inter conversion

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,

Colors to create final animated multimedia object.

COURSE OBJECTIVES: 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.

CONTENTS:

Chapter	Name of Topic	Hrs	Marks
01	**Multimedia Elements & Multimedia Application** 1.1 I/P, O/P devices, 1.2 Evaluation of Multimedia systems, 1.3 Storage media, 1.4 Multimedia file systems.	04	06
02	**Architecture & Issues For Distributed Multimedia System** 2.1 Multimedia System Architecture, 2.2 Distributed Multimedia, 2.3 Synchronization, 2.4 Orchestration & QOS Architecture, 2.5 Framework for Multimedia System	06	08
03	**Compression/Decompression & File Formats** 3.1 Need, Types, 3.2 Evaluating & Visibility, 3.3 Video Compression Technique,	14	14

	3.4 Introduction to Standardization of Algorithm, 3.5 File Formats, History of RIF, TIFF, 3.6 introduction to RIFF, AVI, 3.7 JPEG-objectives, Architecture, JPEG-DCT encoding Quantization, 3.8 PEG-stastical coding, predictive lossless coding, JPEG performance, PEG-objectives, Architecture, 3.9 BIT stream syntax performance, 3.10MPEG2 & MPEG4		
04	**Multimedia Authoring and User Interface** 4.1 Multi Media Authoring System and its type, 4.2 Hypermedia Application Design, 4.3 consideration User Interface Design, 4.4 Information Access, 4.5 Object Display / Playback Issues	08	08
05	**Distributed Multimedia Systems** 5.1 Components of Distributed Multimedia Systems, 5.2 Distributed Client Server Operation, 5.3 Multimedia Object Server, Multi Server Network topologies, 5.4 Distributed Multimedia Databases	08	08
06	**Multimedia Tool** 6.1 Introduction to Multimedia tool – Flash, Creating & Modifying elements, Line tool, fill/attributes, 6.2 different shapes, text tools & pen tool, 6.3 Selecting lines fill with arrow tool, 6.4 Selecting shapes using lasso tool 6.5 performing basic editing tools, 6.6 Selecting & deselecting elements, 6.7 Modifying created objects.	10	10
07	**Creating animation** 7.1 Animation basics, Creating motion, Creating key frames, 7.2 Representations of animation in the Timeline, Frame rates, 7.3 Frame-by-frame animation, Onion skinning, 7.4 Extend still images, Mask layers, 7.5 Using Timeline effects, 7.6 Twinned animation, Special effects, 7.7 Filter- Animation Filters, Create preset filter libraries, 7.8 Blend modes in Flash, Working with text 7.9 Working with sound, Working with video	14	16

PRACTICAL CONTENT:

All of the experiment shall be performed using MS-Flash or 3D-MAX or MAYA.

Students must also do a mini project covering practical knowledge gained in the subject &

submit a brief project report in work book. This report should also include the importance of the project from industry point of view. Each experiment including mini project shall be stored in the CD and updated after every practical session. Students shall maintain a work-book giving details of the work-carried out during every practical session. Assessment shall be done based on the work-book and the CD. This CD along with workbook shall be submitted as term-work.

LIST OF PRACTICALS:

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

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
1	Prabhat K. Andheigh, Kiran Thakrar, John F	Multimedia Systems Design	Sams Techmedia
2	Koegel Buford	Multimedia Systems	Pearson Education
3	Katherine Ulrich	Micromedia Flash For Windows And Macintosh	Pearson Education
4	Free Halshall	Multimedia Communication	Pearson Education
5	R. Steimnetz, K. Nahrstedt	Multimedia Computing, Communication And Application	Pearson Education
7	J.F. Kurose, K. W. Rose	Computer Networking	Pearson Education

COURSE CODE: **5P505** **COURSE NAME: SYSTEMS PROGRAMMING**

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80	--	25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

- Understand internal architecture of assembler, macros, loader and compiler
- To implement searching and sorting techniques
- To understand the design phases of compiler

RATIONALE:

System Programming are the set of software's, which aide in effective communication with the system and makes the user interface more friendly. The main of system programming is to teach procedures for the design of system software like Assemblers, Loaders, and Compliers. Present day computers cannot understand such language without the aid of system programs. System programs e.g. compliers, loaders, macro processors were developed to make computers better adapted to the needs of their users. Farther, people wanted more assistance in the mechanics of preparing their problems.

COURSE OBJECTIVES: Student will be able to

1. Understand various design aspect of the system software.
2. Develop software tools like editors and debuggers.
3. Develop various system software's.

Unit No.	Unit Contents	Marks	hours
1	**Features of System Programming** What is System Software, Components of System Software: Assemblers, Loaders, Macros, Compilers, Evolution of System Software, Foundations of system Programming.	16	12
2	**Assemblers** General design procedure, Design of the assembler - Statement of the problem; Data Structure; Format of databases; Algorithm; Look for modularity, Table Processing: Searching and Sorting- Linear Search, Binary Search, Sorting: Interchange sort; Shell Sort, Bucket sort; Radix exchange sort; Address calculation sort; Comparisons of Sort, Hash or Random entry searching	16	12
3	**Macro Language and Macro Processors** Macro Instructions, Features of a Macro facility - Macro Instruction Arguments, Conditional macro expansion, Macro call within Macros, Macro Instruction defining Macros, Implementation - Implementation of restricted faculty: Two Pass Algorithm, A Single Pass Algorithm, Implementation of macro calls within Macros, Implementation within an assembler.	16	12
4	**Loaders** Loaders Schemes - "Compile and go" loaders, General Loader Schemes, Absolute Loaders, Subroutine linkages, Relocating loaders, Direct linking loaders, Other loaders **------- Progressive Test-2 -----** scheme: Binders, Linking loaders Overlays, Dynamic Binders, Design of Absolute	16	16

	loaders, Design of Direct Linking Loaders, Specification Problem, Specification of data structures, Format of database, Algorithm		

5	**Compliers** Statement of a problem - Recognizing basic elements, Recognizing Syntactic units and Interpreting meaning, Intermediate from: Arithmetic statements, Non-Arithmetic statement, Non-executable statements, Storage Allocation, Code Generation, optimization (M/c independent), Optimization (M/c dependent), Assembly Phase, General Model of Compiler. Phases of Compiler - Lexical Phase, Tasks, Databases, Algorithm, Syntax Phase: Databases, Algorithm, Interpretation Phase, Databases, Algorithm, Optimization. Databases, Algorithm; Storage Assignment: Databases, Algorithm; Code Generation: Databases, Algorithm, Assembly Phase: Databases, Algorithm; Passes of a Compiler	16	12

LIST OF PRACTICALS

1. Programming on sorting and searching techniques Liner search, Binary search, Interchange sort; Shell sort; Bucket sort; Radix exchange sort; Address calculation Sort, Comparisons of sort; Hash or Random entry searching.
2. Design of a single pass assembler or two pass assembler.
3. Design of Macro Processor.
4. Design of Loaders.
5. Design of various phases of Compiler.

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	John J. Donovan	System Programming	Tata McGraw-Hill Edition
02	Mr. Dhamdhere	System Programming and Operating System	Tata McGraw-Hill Edition

COURSE CODE: 5P506 COURSE NAME: MANAGEMENT INFORMATION SYSTEMS

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80	--	25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

1. Student will analyze, design and implement the system.
2. Student will identify and design decision support systems,
3. Student will learn concepts of ERP, EMS, MIS, CRM, BPO & Data Warehousing, and Data Mining.

RATIONALE:

Information system is an integral part of any organization. Therefore person working with any organization must have knowledge of information systems. An effort is made through this subject to introduce basic concepts and design of information system. Knowledge of DSS, various subsystems of MIS and importance of information as an asset and its management, audit, security and testing is essential for an IT professional.

COURSE OBJECTIVES: Students will be able to understand information as an asset.
Hence will take care of managing it.

1. Learn decision-making process.
2. Understand the function of DSS.
3. Describe important role of management information system in modern organization
4. Describe the function of business process Outsourcing, processes in Customer Relationship management.
5. Use data warehouse, data mining for DSS.
6. Prepare a report of any practical MIS system of real life situation.

CONTENTS:

Chapter	Name of Topic	Hrs	Marks
01	**Introduction to MIS** 1.1 Definition of MIS, MIS as evolving concepts, 1.2 MIS & other academic disciplines managerial accounting operation research, management & organization theory, computer science. 1.3 Sub-system of MIS – organization function sub-system, activity, sub-system. 1.4 Strategic Management of Business: concept of corporate planning , 1.5 Types of strategies, tools of planning.	10	12
02	**Concept of Information** 2.1 Definition of information, types of information 2.2 information in the mathematical theory of communication,	12	15

	2.3 Information presentation, 2.4 quality of information, value of information in the decision, 2.5 value of information other than in a decision, 2.6 Application of information, integration of information: Enterprise Resource Planning (ERP)-basic features, benefits, selection & implementation) Enterprise Management System (Introduction), Customer Relationship Management (CRM-concept, three phases of CRM, Benefits) Business Process Outsourcing (Introduction). 2.7 E-Commerce (Introduction).		
03	**Decision Making Process** 3.1 Phases in decision-making process, intelligent & design phases, 3.2 concept of decision-making, 3.3 decision support system (concept, components, development, risk), 3.4 behavioral model of organizational decision-making, 3.5 Data Warehouse (concept, Design, Architecture, Organization & Management, Implementation), 3.6 Data in Data Warehouse, 3.7 Introduction to Data Mining.	12	13
04	**Information Gathering** 4.1 Strategy to gather information, 4.2 information source, 4.3 method of searching for information, 4.4 interviewing techniques, 4.5 questionnaires, 4.6 other methods of information search	05	08
05	**Information Based Support System** 5.1 Support system for planning, 5.2 control and decision-making, 5.3 decision support system, characteristics of DSS, classes of DSS	05	08
06	**Information System Requirement** 6.1 Planning of MIS, 6.2 contents of information system, 6.3 Master plan.	04	06
07	**Control Audit and Security of Information System** 7.1 Control in information systems(Physical, Electronic, Software, Management Controls), 7.2 audit of information systems, 7.3 testing of information systems, and Security of Information Systems: viewing Versus security, Risk, Threats &Vulnerability, Assessing Risks , Common Threats (Natural disaster, employee Error, Computer Crime, Fraud, Abuse, Program Bugs),	12	12

	7.4 Ethical & Contractual Behaviors, Privacy, Access & Accuracy Issues Property Issues		
08	**System Design Case Study (human resource)** 8.1 Employee database, 8.2 recruitment, 8.3 employee appraisal, 8.4 employee training, 8.5 leave accounting, 8.6 Payroll , 8.7 salary calculation & reporting, 8.8 income tax calculation & reporting, 8.9 Loan accounting, 8.10 PF & gratuity, 8.11 Bonus, incentives, 8.12 super anuation, 8.13 Arrears calculation	04	06

LIST OF PRACTICAL:

Student should complete 1 small project, similar to following system listed using MIS/software Engg. Concepts.Student should collect material on ERP, EMS, CRM, BPO & write assignment on the same . Write one Assignment on data warehousing & data mining.

List of software projects– banking system, inventory system, sales & purchase, payroll, electricity billing systems, passenger reservation system, journal acquisition system (maximum 2 students may work on a selected project).

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	Gordon B. Devis, Margrethe H. Olson	Management Information System	McGraw Hill Pub. (2nd Edition)
02	V. Rajaraman	Analysis & Design of Informaiton System	PHI Pub.
03	H. C. Lucas	The Analysis Design & Implementation	McGraw Hill Pub.of Information System
04		Management Information Systems	Tata McGrraw Hill (5th edition) Robert Schulthis & Mary Sumner
05		Management Information Systems	Tata McGrraw Hill (5th edition) O' Brien

06		Management Information Systems	Tata McGrraw Hill (2nd edition) Jawadekar

Web sites:

1. www.en.wikipedia.org
2. www.dwinfocenter.org
3. www.outsourceing.com/bpo

COURSE CODE:5P507 COURSE NAME: COMPUTER GRAPHICS

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80	-	25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

1. Students will be able to develop graphics packages/projects.

RATIONALE:

Graphics feature is one of the important features of any computerized systems. To use images, pictures in any systems one needs the understanding of generation, editing, processing and conversion of it into other types of images. This course introduces the necessary background, the basic algorithms & the applications of computer graphics.

COURSE OBJECTIVES: The student will be able to.

1. Explain the working of computer graphics systems.
2. Use the algorithms like DDA, Bresenhams, mid-point line drawing algorithm, mid-point circle drawing, transformation algorithms, clipping, algorithms.
3. Understand animations, 2D& 3D-Projectons & clipping.
4. Understand the design logic of multimedia devices.

COURSE CONTENTS:

Chapter	Name of Topic	Hrs	Marks
01	**Computer Graphics System** 1.1 What is Computer Graphics? 1.2 GUI Applications, 1.3 Conceptual framework for CG, 1.4 Video display devices, raster scan displays, video controller, random-scan displays, 1.5 Direct view storage tubes, 1.6 Flat panel displays, LCD display and virtual reality system. 1.7 Input Devices: Keyboards, mouse, rack ball & space ball, Joysticks, Data, glove, digitizers, image scanners, light pens, voice system.	10	15
02	**Graphics output primitives and their attributes** 2.1 Points & lines, Line drawing algorithms: DDA Algorithms bresenhams line algorithm, parallel line algorithm, line functions, 2.2 line attribute, type, width, pen and brush option,	14	20

	2.3 Circle generation algorithm, properties of circles, mid-point circle algorithm. 2.4 Pixel addressing & Geometric properties of displayed objects pixel phasing, color and Grayscale levels, pixel lighting		
03	**Two Dimensional Transformations** 3.1 Basic Transformations: Translation, Rotation, Scaling, 3.2 Transformation & from world to viewing co-coordinating projections. 3.3 Clipping, view port clipping, 3.4 clipping in Homogeneous coordinates	10	12
04	**3-D transformations/ User interface** 4.1 3-D viewing: An introduction, Projections, 4.2 3-D transformations, 4.3 Matrix representation, composition of 3-D transformation, 4.4 coordinate system GUI and interactive input methods: The user dialogue, 4.5 Features of GUI: Windows and icons, accommodating multiple skill levels, consistency, minimizing memorization, backup and error handling, feedback. 4.6 Logical classification of input devices, 4.7 input functions, concurrent use of input modes, interactive picture construction techniques	16	18
05	**Multimedia & Computer Animations** 5.1 Design of Animation sequence, general computer animation functions, and computer animation language. 5.2 Key frame systems, goal directed systems. (Introduction with one example), 5.3 What is a multimedia, multimedia building block: text audio, images, animation, and video? 5.4 Elements of multimedia system, multimedia hardware, basic tools in multimedia	14	15

LIST OF EXPERIMENTS/PRACTICAL:
Note-All the below mentioned practical should be performed in the Linux environment.

Minimum of 8 programs / experiments (using C/C++ language) should be conducted on the course & minimum of 2 assignments should be added in the journals on computer graphics systems & computer animation.

1. Write a simple program on geometrical objects using graphics function.
2. Write a program to implement line using DDA algorithms.
3. Write a program to Bresenham's line drawing algorithms.
4. Write a program to Midpoint circle algorithms.

5. Write a program to transform an object(translation)
6. Write a program to transform an object (scale).
7. Write a program to transform an object (rotation).
8. Write a program to implement clipping algorithms.
9. Write any program using computer animation.
10. Study of animation software.

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	Donald Hearn, M. Pauline Baker	Computer Graphics	PHI Publication
02	Newman & Strowell	Interactive Computer Graphics	McGraw Hill
03	Steven Harrington	Computer Graphics: A programming Approach	McGraw Hill
04	J D. Foley & A.V. Dam	Fundamentals of Interactive Computer Graphics	(Addition weselly pub.)

COURSE CODE: 5P508 COURSE NAME: LINUX OPERATING SYSTEM

Particulars	Theory	Practical	Practical	T.W.	Oral	Total
Credit	4	2				6
	Prog. Test	End Exam.				
Marks	20	80	-	25	25	150
Duration	1	3				

COMPETENCY STATEMENT (S):

- Install the Linux Operating System
- Configure linux operating system
- Will administer the Linux Operating System

RATIONALE:
To enhance the value of computer users by gaining an additional set of skill and qualification in the fastest growing Linux Operating System in the world.

COURSE OBJECTIVES: The student will be able to.

1. Understand the fundamentals of Linux operating system.
2. Administer the Linux Operating System.

Contents:-

Chapter	Contents	Marks	Hours
1	**Introduction to LINUX operating system:** 1.1Introduction and installation, 1.2UNIX and LINUX history, 1.3Licensing, FSF / GNU and Open source, 1.4Flavors of Linux Operating System, 1.5 kernel, shell and application, 1.6 role of Kernel, role of shell, types of shells, 1.7 file system / directory structure, multitasking and Multi user, 1.8 LINUX environment, Login, login scripts and profile, 1.9 X- windows system, GUI Under LINUX. 1.10Process management: The process descriptor and task structure, process creation, 1.11LINUX implementation of threads, 1.12process termination.	14	10
2	**Scheduling:** 2.1Input Output bound vs. processor, 2.2 process priority, 2.3 time slice, 2.4 process preemption,	9	8

	2.5Scheduling algorithm, 2.6context switching.		
3	**Internal representation of file and system calls:** 3.1 I nodes, directory, 3.2algorithm for releasing an I nodes and assigning an I nodes, 3.3structure of regular file, 3.4 direct and indirect block in I nodes, 3.5algorithm for conversion of pathname To an I nodes, super block and its structure. 3.6File system calls: open, crpat, read, write fseek, dup, pipe, chair, change, chown, mode, State and stat.	**12**	**10**
4	**Commands in LINUX:** 4.1Command structure, man, cat, cal, date, passwd, less, more, wc, bc, uname, who, tty, Clear, 4.2script File and directory manipulation under LINUX: file concepts, create, copy, rename, delete and move files, ls, comm……, diff, cmp, tar, cat, cal, date, ls, passwd, less, wc, bc, uname, who, etc. archiving utilities, tarm gzip / gunzip…., create, remove, copy listening, changing and printing directory	**13**	**10**
5	**Filter and Vi-Editor:** 5.1Filter and redirection: concept, head, tail, cut, paste, sort, uniq, pr, tee, grep, pipe, and Input, Output redirection 5.2 Creating and viewing files: using the Vi editor, using other editors	**8**	**8**
6	**Shell- Scripting and AWK programming** 6.1Introduction to shell scripts, writing simple shell script, variable. 6.2Control structure: if, for, while, case, positional parameter, writing different shell scripts, 6.3Commands line arguments. 6.4Getting Started with awk, Variables, Control Statements in Actions, BEGIN and END Block, 6.5Writing simple AWK Program, 6.6c programming, Java programming	**12**	**10**
7	**Memory management:** 7.1Pages, zone, 7.2getting pages and zone, 7.3slab layer and slab allocator interface, 7.4virtual file System, vfs objects and their data structure, superblock objects, I node objects, file objects.	**12**	**8**

List of Practical's (Any Twelve)

1. Installation of LINUX operating system (Hardware and software requirement, opening disk for LINUX partition)
2. Executing of basic LINUX commands.

3. Executing of advanced LINUX commands
4. Working on Vi- editor
5. Shell program to check file permission
6. Shell program to print in reverse order
7. Shell program to display system date wise message
8. Shell program to perform string is palindrome or not
9. Shell program to perform arithmetic operations using case statement.
10. Shell program for Bubble sort.
11. Generate a employee report using AWK programming.
12. Generate a student report using AWK programming.
13. Managing users and group and basic network setup.
14. Installation and setup of LINUX-Java package, and Java and C program execution.
15. Write a addition, subtraction, multiplication, division program in C Language using Linux Platform.
16. Write a C program for calculation of square root value on LINUX platform.
17. Write a shell scripts to display
    b. List of files b. Process of users c. User of the system
18. Run the commands for
    b. Who? b). echo c). date d). ls, e). cal, f). dir, g). vdir, h). head, i). tail, j). touch, k). cat, l). copy, m). rename, n). sleep.

REFERENCE BOOKS:

Sr. No.	Author	Title	Publisher
01	Christophe Negus	Red hat Linux – A bibble	Techmedia SAMS.
02	'O' Reilly	LINUX in Nut shell	
03		LINUX Complete	BPB Publication
04			