

PART-II

**CURRICULUM OF DIPLOMA
PROGRAMME**

ON

INFORMATION TECHNOLOGY (IT)

IN

**MULTI POINT ENTRY &
CREDIT SYSTEM**

For the State of Nagaland



Path Finder for Excellence in Technical Education

National Institute of Technical Teachers' Training & Research
Block – FC, Sector – III, Salt Lake City, Kolkata – 700 106
<http://www.nitttrkol.ac.in>

June 2019

SAMPLE PATH: TERM - III
Curriculum Structure and Sample Path for Information Technology

Sl. No.	Code	Course	Study Scheme				Evaluation Scheme							Total Marks	Credit
			Pre-requisite	Contact Hours /Week			Theory				Practical				
				L	T	P	End Exam	Progressive Assignment			End Exam	Progressive Assignment			
								Class Test	Assign-ment	Attend-ance		Sessional	Viva		
1	G105	Applied Mathematics	NIL	3	1	0	75	10	10	5	0	0	0	100	4
2	G301-307	Soft Core-I	NIL	3	0	0	75	10	10	5	-	-	-	100	3
3	IT515	PC Utilities Lab	NIL	0	0	4	0	0	0	0	0	50	0	50	2
4	IT411	Digital circuit	NIL	3	0	2	75	10	10	5	25	25	0	150	4
5	IT408	Computer Architecture & Organization	NIL	3	0	0	75	10	10	5	0	0	0	100	3
6	IT503	Object Oriented Programming in C++	G205B	3	1	3	75	10	10	5	25	25	0	150	5
7	IT501	Webpage Design – I	NIL	2	1	4	75	10	10	5	25	25	0	150	5
8	IT508	Professional Practice-II		0	0	2	-	-	-	-	-	50	-	50	1
Total				17	3	15	450	60	60	30	75	175	-	850	27

SAMPLE PATH: TERM - IV
Curriculum Structure and Sample Path for Informational Technology

Sl. No.	Code	Course	Study Scheme				Evaluation Scheme							Total Marks	Credit
			Pre-requisite	Contact Hours /Week			Theory				Practical				
				L	T	P	End Exam	Progressive Assignment			End Exam	Progressive Assignment			
								Class Test	Assign-ment	Attend-ance		Sessional	Viva		
1	IT406	Microprocessor & Interfacing	IT411 IT408	3	0	2	75	10	10	5	25	25	0	150	4
2	IT401	Data Structure & Algorithm	G205B	3	0	4	75	10	10	5	25	25	0	150	5
3	IT402	Network Essentials	NIL	3	0	2	75	10	10	5	25	25	0	150	4
4	IT404	Operating System	IT408	3	0	2	75	10	10	5	25	25	0	150	4
5	IT403	Principal of Telecommunication		3	1	2	75	10	10	5	25	25	0	150	5
6	G301-307	Softcore – II	NIL	3	0	0	75	10	10	5	0	0	0	100	3
7	IT509	Professional Practices-III		0	0	2	-	-	-	-	-	50	-	50	1
8	G302	Development of Life Skill-II		1	0	2	-	-	-	-	-	25	25	50	2
Total				19	1	16	450	60	60	30	125	175	25	950	28

SAMPLE PATH: TERM - V

Sl. No	Code	Course	Study Scheme				Evaluation Scheme							Total Marks	Credit
			Pre-requisit e	Contact Hours / Week			Theory			Practical					
				L	T	P	End Exam	Progressive Assessment			End Exam	Progressive Assessment			
								Class Test	Assig nment	Atten dance		Sessional	Viva-voce		
1	IT504	Object Oriented Methodology in JAVA	IT503	4	1	2	75	10	10	5	25	25	0	150	6
2	IT407	Software Engineering	NIL	3	1	0	75	10	10	5	0	0	0	100	4
3	IT512	Internetworking and Web Technology	IT402	3	1	3	75	10	10	5	25	25	0	150	5
4	IT405	Database Management System	IT401	3	1	4	75	10	10	5	25	25	0	150	6
5	IT513	Business Data Processing		3	1	4	75	10	10	5	25	25	0	150	6
6	IT510	Professional Practices-IV		0	0	2	0	0	0	0	0	50	0	50	1
	Total			16	5	15	375	50	50	25	100	150	0	750	28

SAMPLE PATH: TERM - VI

Sl. No	Code	Course	Study Scheme				Evaluation Scheme							Total Marks	Credit
			Pre-requisite	Contact Hours / Week			Theory			Practical					
				L	T	P	End Exam	Progressive Assessment			End Exam	Progressive Assessment			
						Class Test		Assignment	Attendance			Sessional	Viva-voce		
1	IT505	Multimedia Technology and Application	NIL	4	0	4	75	10	10	5	50	25	25	200	6
2	IT601	Elective I*		3	1	0	75	10	10	5	0	0	0	100	4
2	IT602	Elective II*		3	1	0	75	10	10	5	0	0	0	100	4
4	IT410	Linux Operating System	IT404	3	1	4	75	10	10	5	25	25	25	175	6
5	IT506	Project		0	0	14	0	0	0	0	100	50	50	200	7
6	IT511	Professional Practices-V		0	0	2	0	0	0	0	0	50	0	50	1
Total				13	3	24	300	40	40	20	175	150	100	825	28

*Elective 1: computer networks, cloud computing

*Elective 2: network management, web technology

6	IT512	Industrial Training		0	0	0	-	-	-	-	100	100	-	200	10
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TERM - III

APPLIED MATHEMATICS			
Course code: G105		Semester : Third	
Teaching Scheme		Maximum Marks : 100	
		PA and End Examination Scheme	
Theory : 3 hrs/week		Class test: 10 Marks Sessional 0	
Tutorial: 1 hrs / week		Assignment/Quiz etc./Attendance: 15 Marks	
Practical : NIL		End Semester Theory Exam: 75	
Credit : 4		End Semester Practical Exam: 0	
Rationale / Aim :-			
<p>Mathematics is an important tool to solve wide variety of engineering problems. Most of the technological processes in industry are described effectively by using mathematical framework. Mathematics has played an important role in the development of mechanical, civil, aeronautical and chemical engineering through its contribution to mechanics of rigid bodies, hydrodynamics, aerodynamics and heat transfer etc. It has become of great interest to electrical engineers through its application to information theory, design of digital computer etc.</p> <p>Through this syllabus we aim to give students a strong foundation in Matrix and Vector with their applications. We also aim to give detail idea of Numerical Integration, Numerical solution of Non-Linear Equation, Gauss Elimination method and Differential Equations with application problems.</p>			
UNIT	TOPIC/SUB-TOPIC	Contact Hrs.	
1.0	Numerical Analysis 1.1 Interpolation. (i) introduction to interpolation. (ii) Lagrange's interpolation formula. (iii) The operators Δ , ∇ and E .Relation between them. (iv) Difference Table. (v) Newton's forward and backward interpolation formula. (vi) Concept of extrapolation. 1.2 Numerical Differentiation and Integration. (i) Newton's forward and backward difference formula for differentiation $\left(\frac{dy}{dx}, \frac{d^2y}{dx^2}\right)$ at any point at $x = x_0$ or $x = x_n$ 1.3 Numerical Integration. (i) Trapezoidal rule and Simpson's $\frac{1}{3}$ rd rule. 1.4 Numerical Solution of Ordinary Differential Equation (i) Introduction. (ii) Runge Kutta's 2 nd and 4 th order methods.	15	
2.0	Differential Equations (ordinary)	15	

3.0	<ul style="list-style-type: none"> (i) Introduction. (ii) Order and degree of a differential equation. (iii) Formation of Differential Equations. (iv) Solution of a Differential Equation. (v) Differential equation of the first order and first degree. (vi) Variables separable. (vii) Homogeneous Differential Equations. (viii) Linear Differential Equations. (ix) Equations reducible to linear form. (x) Exact differential Equations. (xi) Equations reducible to the exact form. (xii) Linear Differential Equations of second order with constant coefficients. (xiii) Complete solution = Complementary Function + Particular Integral. (xiv) Method of finding Particular Integral. (xv) Applications of differential equations to electrical circuit (xvi) problems. (xvii) Problems related to other physical systems. <p>Graph Theory</p> <ul style="list-style-type: none"> (i) Introduction. (ii) Basic Terminology. (iii) Simple Graph, Multigraph and Pseudo graph. (iv) Degree of a Vertex. (v) Types of Graphs. (vi) Subgraphs and Isomorphic Graphs. (vii) Operations of Graphs. (viii) Paths, Cycles and Connectivity. (ix) Eulerian and Hamiltonian Graph. (x) Shortest Path Problems using known Algorithm (xi) Representation of Graphs. (xii) Planar Graph. 	20	
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	(xiii) Graph Colouring.		
4.0	Discrete Mathematics 5.1 The principle of Inclusion and Exclusion with examples. 5.2 Generating Functions. (i) Introductory examples. (ii) Definition and examples of Calculation Techniques. (iii) Partition of integers with problems. (iv) Exponential Generating function with problems. 5.3 Recurrence Relations. (i) First order linear recurrence relations (ii) Second order linear homogeneous recurrence relations with constant coefficients. (iii) Non-homogeneous recurrence relations. (iv) (iv)Method of generating functions (v) (v) Problems on all the above topics..	10	
		Total hours	
		60	

Reference Books.

- (1) Integral Calculus by B.C.Das and B.N.Mukherjee.
- (2) Diploma Engineering Mathematics (Volume-II) by B.K.Pal.
- (3) Applied Mathematics-I by Dr.J.S.Bindra and K.S.Gill.
- (4) Applied Mathematics-II by Dr.J.S.Bindra and K.S.Gill.
- (5) Applied Mathematics-III by Dr.J.S.Bindra.
- (6) Engineering Mathematics (Volume-I, Volume-II & Volume-III)
By S.Arumugam, A.Thangapandi Issac and A.Somsundaram.
- (7) Discrete and Combinatorial Mathematics by Ralph P.Grimaldi.
- (8) A TEXT BOOK OF DISCRETE MATHEMATICS by Swapan Kumar Sarkar.
- (9) Mathematics for Polytechnic by S.P.Deshpande.
- (10) Higher Engineering Mathematics by B.S.Grewal.
- (11) Introductory Method of Numerical Analysis by S.S.Sastry.
- (12) Calculus of Finite Difference and Numerical Analysis by Gupta-Malik.

SOFTCORE – I ENVIRONMENTAL EDUCATION	
Course code: G307	Semester : Third
Teaching Scheme	Maximum Marks : 100
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks Sessional 0
Tutorial: 0 hrs/week	Assignment/Quiz etc./Attendance: 15 Marks
Practical : 0 hrs/week	End Semester Theory Exam: 75
Credit : 3	End Semester Practical Exam: 0

RATIONALE:

Management of Environmental Degradation as also its control using innovative technologies is of prime importance in the times we are living in. Since the days of the famed Rio Summit (1992) awareness about degradation of environment we live in and its management through participation of one and all has literally blossomed into a full-fledged movement of universal importance. Technically qualified people, such as the Diploma Engineers, should not only be aware about new technologies to combat environmental degradation at their disposal but also various aspects of environment, ecology, bio-diversity, management, and legislation so that they can perform their jobs with a wider perspective and informed citizens. This course can be taken by all diploma students irrespective of their specializations.

DETAILED COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC	Lecture Hrs.
1.0 INTRODUCTION	2
1.1 Introduction	
1.2 Environment and its components	
1.3 Environment in India	
1.4 Public Awareness	
2.0 ECOLOGICAL ASPECTS OF ENVIRONMENT	8

2.1 Ecology

- Eco-system
- Factors affecting Eco-system

2.2 Bio-geochemical cycles

- Hydrological cycle
- Carbon cycle
- Oxygen cycle
- Nitrogen cycle
- Phosphorous cycle
- Sulphur cycle

2.3 Bio-diversity

2.4 Bio-diversity Index

3.0 NATURAL RESOURCES

5

3.1 Definition of Natural Resources

3.2 Types of Natural Resources

3.3 Quality of life

3.4 Population & Environment

3.5 Water Resources

- Sources of Water

3.6 Water Demand

3.7 Forest as Natural Resource

- Forest and Environment
- Deforestation
- Afforestation
- Forest Conservation, its methods

3.8 Land

- Uses and abuses of waste and wet land

4.0 GLOBAL ENVIRONMENTAL ISSUES

9

4.1 Introduction

4.2 Major Global Environmental Problems

4.3 Acid Rain

- Effects of Acid Rain

4.4 Depletion of Ozone Layer

- Effects of Ozone Layer Depletion

4.5 Measures against Global Warming

4.6 Green House Effect

5.0 ENVIRONMENTAL POLLUTION

9

5.1 Introduction

5.2 Water Pollution

- Characteristics of domestic waste water
- Principles of water treatment
- Water treatment plant (for few industries only- unit operations & unit processes - names only)

5.3 Air Pollution

- Types of air pollutants
- Sources of Air Pollution
- Effects of Air Pollutants

5.4 Noise Pollution

- Places of noise pollution
- Effect of noise pollution

6.0 CLEAN TECHNOLOGY

6

6.1 Introduction to Clean Technologies

6.2 Types of Energy Sources

- Conventional Energy sources
- Non-conventional sources of Energy

6.3 Types of Pesticides

6.4 Integrated Pest Management

7.0 ENVIRONMENTAL LEGISLATION

3

7.1 Introduction to Environmental Legislation

7.2 Introduction to Environmental Laws

8.1 Introduction to Environmental Impact Assessment

8.2 Environmental Management (elements of ISO 14001)

8.3 Environmental ethics

8.4

SUGGESTED IMPLEMENTATION STRATEGIES:

The teachers are expected to teach the students as per the prescribed subject content. This subject does not have any practical but will have only demonstration and field visit as stated. The students will have to prepare report of the site visit.

SUGGESTED LEARNING RESOURCES:

(a) Reference Books:

S. No.	Title	Author, Publisher, Edition & Year
1.	Environmental Engineering	Pandya & Carny, Tata McGraw Hill, New Delhi
2.	Introduction to Environmental Engineering and Science	Gilbert M. Masters Tata McGraw Hill, New Delhi
3.	Waste Water Engineering – Treatment, Disposal & Reuse	Metcalf & Eddy Tata McGraw Hill, New Delhi
4.	Environmental Engineering	Peavy, TMH International New York
5.	Study / training materials, references, reports etc. developed by Central Pollution Control Board, New Delhi as also State Pollution Control Boards	Central Pollution Control Board Postal Address: Parivesh Bhawan, CBD-cum-Office Complex East Arjun Nagar, DELHI - 110 032, INDIA Tel.: 91-11-22307233 Fax: 91-11-22304948 e-mail: ccb.cpcb@nic.in
6.	Environmental Science	Aluwalia & Malhotra, Ane Books Pvt. Ltd, New Delhi
7.	Text Book of Environment & Ecology	Sing, Sing & Malaviya, Acme Learning, New Delhi
8.	Environmental Science & Ethics	Sing, Malaviya & Sing, Acme Learning, New Delhi
9.	Environmental Chemistry	Samir K. Banerji, Prentice Hall of India, New Delhi

(b) Others:

1. Text book mentioned in the references
2. Lab Manuals
3. OHP Transparencies
4. Video film on Environment

SUGGESTED LIST OF DEMONSTRATIONS/FIELD VISIT

- pH value of water sample.
- Hardness of water
- Calcium hardness
- Total Hardness
- Residual Chlorine to a given sample of water
- Turbidity
- B.O.D.
- C.O.D.

Visits: Following visits shall be arranged by the teachers during the semester:

- Water Treatment Plant
- Sewage Treatment Plant
- Maintenance work of water supply mains and sewage system

PC UTILITIES LAB	
Course code: IT515	Semester : Third
Teaching Scheme	Maximum Marks : 50
	PA and End Examination Scheme
Theory : NIL	Class test: 0Marks Sessional 50
Tutorial: NIL	Assignment/Quiz etc./Attendance: 0 Marks
Practical : 4 hrs/week	End Semester Theory Exam: 0
Credit : 2	End Semester Practical Exam: 0
Rationale / Aim :-	
This programme aims to provide skill set in use of computer system, peripherals and software. It also enhances the skill of Internet uses.	

Practical

- 1. Introduction to MS Office**
Basic features of Ms Office, Overview of Different Office Tools
- 2. Introduction to MS Word**
Creating and Editing document, Formatting Documents, Working with Tables, Spell checking, Mail Merging, Importing Graphics into word Document
- 3. Introduction to MS Excel**
Creating a New Work Book, Entering Labels, Values and Formulas, Formatting the layout, Working with Functions, Creating the Chart from data, Writing macros
- 4. Introduction to Power Point**
Creating a Presentation, Adding/Editing Text, Working with objects, Formatting the Presentation, Placing the chart in slide, Slide Show and Printing
- 5. Introduction to MS Access**
Creation of database
Creation of tables - Field Declaration, Data type Declaration, Constraint Declaration. Working with records, Querying the database, Joining Tables, Designing the Form, Creating the report
- 6. Internet Browsing, Surfing and Email.**
Use of Internet for searching and browsing. Surfing through the various websites and web applications. Email communication, uses of cloud storage like drive, dropbox, etc.
- 7. Social Networking Applications**
Use of Social Networking sites like Linked in, Facebook, Tweeter, etc.

REFERENCE BOOKS :

1. Manual for MS Office
2. Self Learning Study Material on MSWORD developed by TTTI, Calcutta
3. Self Learning Study Material on MS POWER POINT developed by TTTI, Calcutta
4. Self Learning Study Material on MS EXCEL developed by TTTI, TTTI, Calcutta
5. B.B. Dam, H.C. Gautam, Theory and Practice of Financial Accounting, Ashok Publication:
6. Sanjay Saxena, P. Chopra, Computer application in Management, Vikas Publishing House Pvt. Ltd., New Delhi.
7. Marshall Romeny & Steinbart, Accounting Information System, Perason Education, New Delhi.
8. K.K. Nadhani, Implementing Tally ERP 9, BPB Publications, New Delhi.

DIGITAL CIRCUITS	
Course code: IT411	Semester : Third
Teaching Scheme	Maximum Marks : 150
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks Sessional 25
Tutorial: NIL	Assignment/Quiz etc./Attendance: 15 Marks
Practical : 2 hrs / week	End Semester Theory Exam: 75
Credit : 4	End Semester Practical Exam: 25
Rationale / Aim :-	
This course deals with digital electronic components and circuits. It focuses on elementary topics like number systems, Boolean algebra, logic gates, various digital circuits using logic gate like combinational circuits, flip-flops, shift registers. It also covers memory devices, data converters and display and display drives.	

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.	Number System: Number Systems and Codes : Decimal, Binary, Octal, Hexadecimal number system and conversion from one number system to another, Arithmetic operations using these number systems, Representation of negative number in the different number systems, Complements and complement subtraction, Different codes (8421, Ex~3, 2421, Gray, Alphanumeric, BCD, Seven segment codes etc) and code conversions.	6
2.0	Boolean Algebra and Logic Gates: Postulates and different theorems. SOP and POS forms of expression and their conversion. Simplification : using Boolean theorems and k-map (up to 4 variables) Basic logic gates - their symbols, truth table and logic ' expression for the output simple circuit realization using the logic gates. Realization of any expression either using all NAND or NOR gates	6
3.0	Combinational Logic Circuits : Arithmetic circuit (Adder/ Subtractor), Multiplexers and their uses, Decoder/demultiplexers and their uses, code converter, Encoder, parity generator/checkers.	8
4.0	Families of Logic Circuit : TTL and CMOS family, open collector and tri-state logic gates.	3
5.0	Storage Devices & Sequential Circuits : Latches and Flip-flops, Timing diagrams of latches and flip flops, conversion of one flipflop to another, Counters - Binary ripple counters, Asynchronous module counters, UP/Down counter, Synchronous counters (binary, different modulo and UP/Down), Timing diagram of all types of counters. Brief introduction to a few commercially available counter ICs	06+04+02 = 12

(asynchronous and synchronous).

5.1 Shift-registers-Different types of shift registers and their functional details,
A few applications of shift-registers.

5.2 Memory -Memory types and terminology, Memory organization,
Semiconductor memory, reading and writing, RAM, ROM, PROM cells
and circuits, EPROM (Programming and erasing), Dynamic RAM, Memory
expansion, PLA.

6.0 Data Converters :

6

Digital-to-Analog Conversion - Weighted resistor, R-2R ladder, DAC
performance and their characteristics.

Analog-to-Digital Conversion - Counter type ADC, dual slope type,
successive approximation type, tracking type and flash type, ADC
performance and their characteristics.

7.0 Display and Display Drives :

4

Introduction to LED, LCD, 7-segment displays, Bar graph display and
Dot matrix displays. Decoder drivers for 7-segment display, Bar graph
display and LCD. Multiplexing of display.

45

Practical

1. Verification of truth tables of different basic logic gates.
2. Realisation of logic expressions using different basic logic gates.
3. Realisation of logic expressions using either all NAND or all NOR gates.
4. Adder circuits (Half, Full-adder) design.
5. Design of a multiplexer using logic gates (4 to 1 Multiplexer)
6. Use of commercially available multiplexer ICs to realise two logic functions.
7. Design of a decoder using logic gates (2 to 4 decoder)
8. Use of commercially available decoder ICs to realise two logic functions.
9. Design of RS, JK, D latches using logic gates.
10. Design of master/slave JK flip-flop.
11. To study the functional behaviour of some commercially available flip-flop ICs (JK and D)
12. Counter design (modulo 6 and 10 asynchronous and synchronous counters) using flip-flop and to display the counts on 7-segment display units.
13. To study the performance of some commercially available counter ICs (asynchronous and synchronous), cascading of counter ICs, Different modulo (MOD-6 and MOD-10) counter design using counter ICs.
14. To design a shift register using flip-flops and to study its behaviour.
15. To study the different functional features of shift register ICs.

REFERENCE BOOKS :

1. Digital Systems – by Ronald J. Tocci, PHI
2. Digital Design – by Mano, PHI
3. Digital Logic & Comp. Design – by Mano, PHI

LIST OF EQUIPMENT

1. Digital Trainer Kit
2. Powered Project board containing
 - i) Solderless breadboard with

- ii) Power supply
 - iii) Power lead and connector plate
3. Logic Trainer lab with
- i) DC power supply (+5V, 1A, 5V at 500 mA +/- 15V at 500 mA)
 - ii) Logic Switches (slide)
 - iii) Pulse generator 1Hz, 10Hz & 100 Hz sq. wave
 - iv) Logic gates (30 built in logic gates comprising dual input for each of AND, OR, NAND, NOR, XOR & NOT gates)
 - v) Power supply
4. Flip-flop trainer kit
5. Counter trainer kit

COMPUTER ARCHITECTURE & ORGANIZATION	
Course code: IT408	Semester : Third
Teaching Scheme	Maximum Marks : 100
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks Sessional: 0
Tutorial: NIL	Assignment/Quiz etc./Attendance: 15 Marks
Practical : NIL	End Semester Theory Exam: 75
Credit : 3	End Semester Practical Exam: 0
Rationale / Aim :-	
This course deals with evolution of computers, and numbers representation. Various block components like CPU, Memory, I/O devices and peripherals are covered in details. This course helps in building concept of a student that will further help in better understanding of subjects like microprocessor, operating system, etc.	

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.	Evolution of Computers : Brief history of development; Babbage's machines, Von Neumann Concept, Difference between calculators and computers, Generations of Computer -SSI, LSI, VLSI, Classification - micro, mini, main frames and supercomputers. PC's and portable systems.	5
2.	Number Representation : Signed numbers, Signed - magnitude 1's complement, 2's complement and excess notations, numbers, Fixed and floating point numbers and operations, Booth's Algorithm, Common errors in arithmetic truncation errors, round off errors. Codes : weighted and non-weighted, BCD, ASCII, EBCDIC	5
3.	Central Processing Unit : Components of Arithmetic Logic Unit (in block diagram only), Different types of instructions, Instruction format, addressing modes, different CPU registers - Accumulator, Flag, Program Counter, Instruction Register and General Purpose registers. Hardware control unit - its different functions	8
4.	Microprocessor : Intel 8085 architecture and simple assembly language programming concept, Brief introduction to Intel 8086/8088 and Pentium processor (relative study), Brief introduction to RISC processor	7
5.	Memory : Concept of bits, bytes and words; Storage of numbers and characters, RAM, ROM, EPROM; Concept of cache memory - its role in performance improvement, memory hierarchy	6

6.	I/O Devices :	10
	Printers - Dot Matrix, Ink Jet, Line, Laser; Visual display unit – alphanumeric and graphic, Keyboard, Graphics devices - mouse, joy-stick, Scanners and digitizers, Auxiliary storage devices - floppy and Hard disk : Sectors, tracks and cylinders, accessing mechanisms (brief idea) Magnetic tapes - description and accessing mechanisms, CD ROM	

7.	PC Architecture	4

		45

REFERENCE BOOKS:

1. Computer Organization & Architecture – by Stallings, PHI
2. Computer Organization – by V. C. Hamacher, Z. G. Vranesic & S. G. Zaki, MGH
3. Computer Architecture & Organization – by J. P. Hayes, MGH
4. Computer Organization & Design – by Pal Chaudhuri, PHI
5. Computer System Architecture – by Mano, PHI

OBJECT ORIENTED PROGRAMMING USING C++	
Course code: IT503	Semester : Third
Teaching Scheme	Maximum Marks : 150
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks Sessional 25
Tutorial: 1 hrs/week	Assignment/Quiz etc./Attendance: 15 Marks
Practical : 3 hrs / week	End Semester Theory Exam: 75
Credit : 5	End Semester Practical Exam: 25
Rationale / Aim :-	
Object oriented programming using C++ is a course in the area of Computer Science and Informational Technology that will help the student to develop concept like, Objects and classes, function overloading, virtual functions, etc. Further, this will help the learners to understand the concepts of data encapsulation, inheritance and polymorphism in the area of coding using C++ as a programming language.	

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.	Introduction To Object Oriented Programming Introduction to object oriented approach Need of object oriented programming Identifying objects Characteristics of object oriented Programming language Basic concepts of OOPs objects, classes, data encapsulation, inheritance, Polymorphism and overloading Comparison of object oriented language and procedure oriented language	5
2.	Object Oriented Language C++ Features Common statement Basic data types Operators Arithmetic, relational, logical operators Manipulators, assignment and conditional operators New and delete operators Control structure FOR loop WHILE loop If-else statement Switch statement Break and continue statement	6
3.	Arrays and Pointers Defining an array and accessing it's elements Array as class member data Array of objects Addresses and pointers Pointers and functions	5

4.	Structure and Functions Specifying the structure Defining a structure variable Accessing the members of a structure Enumerated data types Function definition and declaration	4
5.	Objects and Classes Definition and declaration Access specifier: Private, public and protected Constructor, destructor Structures and classes	6
6.	Operator Overloading Basic concepts of overloading Overloading unary operators Overloading binary operators Advantages of operator overloading	4
7.	Inheritance Definition of inheritance Basic concepts of 'Base class' and 'derived class' Derived class constructor Public and private inheritance Types of inheritance: Single, Multiple & multilevel inheritance , Hierarchical, and Hybrid inheritance,	5
8.	Polymorphism Introduction to Polymorphism in programming languages Types of polymorphism Polymorphic variables	4
9.	Virtual Functions Definition of virtual function Friend function and friend classes Use of 'this' pointer	3
10.	Templates Introduction to templates Class templates Member function template	3

C++ Lab – 30 hrs.

Problems on :-

Objects and classes

Declaring and creating objects

Constructors
Modifiers
Passing objects to methods
Instance variables and class variables
Instance method & class method
Scope of variables interface and packages
Introductory Problems on Class Inheritance Super classes and sub class
Calling super class constructors
Calling super class methods
Object class
Number class
Processing date and time
Class Templates and Exceptional handling

REFERENCE BOOKS :

1. Object Oriented Programming – by E. Balaguruswamy, TMH
2. Software Engineering – by Roger S. Pressman, PHI
3. Object Oriented Modeling & Design – by James Rumbaugh, Michael Blaha, William Premerlani, Frederick Eddy, William Lorensen, PHI
4. Visual Basic Developers Guide – BPB Publication
5. Mastering Visual Basic – BPB Publication

LIST OF EQUIPMENT

Hardware : Stand alone PC
(for detail, please refer Annex – I)

Software : C++ Compiler / Visual Studio.

WEBPAGE DESIGN - I	
Course code: IT501	Semester : Third
Teaching Scheme	Maximum Marks : 150
	PA and End Examination Scheme
Theory : 2 hrs/week	Class test: 10 Marks Sessional 50
Tutorial: 1 hrs/week	Assignment/Quiz etc./Attendance: 15 Marks
Practical : 4 hrs / week	End Semester Theory Exam: 75
Credit : 5	End Semester Practical Exam: 50
Rationale / Aim :-	
The aim of this course is to train the student in the design, development, and deployment of the Web based applications. The course will develop soft and technical skills in student related to design of the web based application related to e-commerce, e-governance, e-learning and related areas.	

THEORY

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1	Basic anatomy of HMTL documents Basic HTML tags, Basic Structure, Paragraph, Style Formatting, Hyperlinks, Heading, Images, List, Frames, Forms, Tables.	10
2	XML Basic XML Document, Document type Definition, XSLT, Well formed Documents.	8
3	Cascaded Style Sheet: Introduction to CSS, CSS Syntax, CSS Borders, Margin and Padding, CSS Box Model, Height/Width, CSS text, Font Color changing, CSS List and Tables	4
4	Javascript: Introduction to Javascript, Javascript Data Types, variables, operator, functions and Object.	8
Total		15

Laboratory Experiments to perform

Create a HTML document as a static web page

Create XML document for data handling, Use DTD, and CSS

Document formatting using CSS.

Use Javascript to create forms, and connect to data bases

Text /Reference Books:			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
C. Musciano and B. Kennedy	HTML: The Definitive Guide	3 rd	O'Reilly
R. Lerdorf, K. Tatroe, P. MacIntyre	Programming PHP	3 rd	O'Reilly
E.R. Harold, W.S. Means	XML in a Nutshell	3 rd	O'Reilly
H. Williamson	XML: the complete reference	11 th reprint	TMH
P. Hanna	JSP 2.0 The complete Reference	18 th reprint	TMH

LIST OF EQUIPMENT

Hardware : Stand alone PC
 (for detail, please refer Annex – I)

Software : Notepad and Browser.

PROFESSIONAL PRACTICES - II	
Course code: IT508	Semester : Third
Teaching Scheme	Maximum Marks : 50
	PA and End Examination Scheme
Theory : 0 hrs / week	Class test: 0 Marks Sessional 50
Tutorial: 0 hrs / week	Assignment/Quiz etc./Attendance: 0 Marks
Practical : 2 hrs / week	End Semester Theory Exam: 0
Credit : 1	End Semester Practical Exam: 0
Rationale / Aim :-	
Interact with industry is essential for proper understanding about implementation procedure of the theoretical knowledge gained during course of study. The course content of professional practice-III is designed to develop interpersonal skill and adoptability to the industry so that the student will be benefited in their professional carrier.	

The course aims to equip students with basic knowledge and skills about Basic concept of PC assembly and installation of operating system software

Objective: On completion of this course, the Student will be able to:

- Assembly different PC system
- Install various kind of operating system

Suggested List of activities to be done:

- Assemble of PC System with 3 to 4 types of motherboard
- Installation of more than 3 to 4 types of operating system (Linux, different types of Window OS, Ubuntu & etc)

SUGGESTED LEARNING RESOURCES

1. Hardware and Software of Personal Computers – by S.K. Bose, New Age International

TERM - IV

MICROPROCESSOR & INTERFACING			
Course code: IT406		Semester : Fourth	
Teaching Scheme		Maximum Marks : 150	
		PA and End Examination Scheme	
Theory : 3 hrs/week		Class test: 10 Marks Sessional 25	
Tutorial: 0 hrs / week		Assignment/Quiz etc./Attendance: 15 Marks	
Practical : 2 hrs /week		End Semester Theory Exam: 75	
Credit : 4		End Semester Practical Exam: 25	
Rationale / Aim :-			
The course Microprocessor and Interfacing is designed to explain the concept of single chip computer with minimum hardware peripherals attached to execute programs. The students will undersigned the configuration of the Intel 8085 and 8086 microprocessors. The student will also learn how to do assembly level programming using these microprocessor including memory and I/O interface.			
UNIT-1	Introduction to Microprocessor - Evolution of Microprocessors, Specific features of Microprocessors, Application in our daily life (a few examples)	2	
Unit -2	Internal architecture of a microprocessor (using block diagram); Explanation of each block in brief, Concept of bus structure, Register-to-register transfer, Communication with I/O and memory (This part can be explained using the specific microprocessors like 8085 or 8086/8088). Pin details of 8085 and 8086/8088 CPU and their functions in brief	6	
Unit -3	Addressing modes in general (may be limited to 8085 and 8086/8088 CPU), Instruction cycles, Instruction set, timing diagram (may be limited to 8085 and 8086/8088 CPU). Concept of assemblers and compilers	3	
UNIT-4	Interfacing of Memory and I/O devices : Concept of address space, address/data bus demultiplexing, address and data bus buffering, address decoding, I/O concepts, memory interfacing concept of I/O mapped I/O and memory mapped I/O. Interrupts - Types of interrupts, Hardware and software data transfer schemes - Synchronous, asynchronous and interrupt driven.	5	

UNIT-5	Assembly Language Programming : (This part may be limited to the use assembly language of 8085 or 8086/8088 CPU) i) Example for register to register, register to memory, memory to register, block of data movement from one area of memory to another, merging of two blocks of data, data block exchange. ii) Examples of arithmetic addition, subtraction, multiplication and division iii) Examples of searching and sorting (simple) iv) Examples using of look up tables v) Use subroutines and delay programme.	10	
UNIT-6	Peripheral chips and their Interfacing : Functional description of 8255, 8253, 8251, 8257, 8237 and 8259. Interfacing of these chips with some standard CPU. Simple assembly language programme to explain the function of these chips.	6	
UNIT-7	Special Purpose Interfacing Devices and their Interfacing : Keyboard interfacing, 7 segment and dot matrix display interfacing, A/D and D/A interfacing, Stepper motor interfacing	4	
UNIT-8	Recent standard μ p : Intel family, HP family and Motorola family. Concepts of embedded μ p.	4	
UNIT-9	PC Interfacing : Simple interfacing of Input/Output peripherals like LED, 7 segment LED display modules, steppes motor, relays through digital I/O card or through the parallel port. Serial link between microprocessor trainer kit and PC serial port, EPROM programming using PC port.	5	
Total		45	

Suggested List of Laboratory Experiments :-		
Expt No	Laboratory Experiments to perform	Hrs
1	Acquaintance with the microprocessor trainer kit hardware and the user's commands (Dynalog/Vinyties/ALS)	
2	Assembly language programme development : Data transfer programme - Register to Register, Register to Memory and Vice-Versa Arithmetic Operation - 8 bit addition and subtraction, multi-byte addition and subtraction, BCD addition and subtraction, multiplication using repeated addition, multiplication using shift-add process, signed multiplication, Binary division, BCD division	
3	Array processing - Adding one entry to an array, checking of an ordered list, replacing of one or more entries in a list, sorting and searching, block movement,	

	block exchange and data insertion	
4	Look-up table - finding squares, cubes etc., of a number using look-up table, code conversion using look-up table	
5	Delay program, use of subroutine (use the above programme as a subroutine in a main programme)	
6	Data Input/Output - Programming 8255 with the basic I/O modes, programming 8253, interfacing 7-segment display, bar graph display, multiplexed display, programming 8253, in different modes, waveshape generation using 8253, Interfacing of ADC and DAC with microprocessors/microcontroller, keyboard interfacing (using interrupts or polling) to microprocessor/microcontroller, relay interfacing, stepper motor interfacing.	
7	PC Interfacing : Experiments on ADC/DAC interfacing, to stepper motor interfacing and display interfacing, Other interfacing problems may be repeated using PC interfacing and run by using any High level language.	

Name of Authors	Titles of the Book	Name of the Publisher
A.P. Mathur	Introduction to Microprocessor - by,	TMH
Ramesh S. Gaonkar	Microprocessor	PHI
D.Hall,	Microprocessor	MGH
Govindara jalu,	IBM PC & Clones	TMH
William Stalings	Computer Organization & Architecture	PHI

DATA STRUCTURE & ALGORITHM	
Course code: IT401	Semester : Fourth
Teaching Scheme	Maximum Marks : 150
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks Sessional 25
Tutorial: NIL	Assignment/Quiz etc./Attendance: 15 Marks
Practical : 4 hrs / week	End Semester Theory Exam: 75
Credit : 5	End Semester Practical Exam: 25
Rationale / Aim :-	
This subject is essential for diploma students for Computer Science to have fundamental idea on related topics like string processing, arrays, records, linked list, tree, stacks, recursion, etc. and applications of them.	

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.	Introduction and Overview	2
	1.1 Introduction	
	1.2 Basic Terminology	
	1.3 Elementary Data Organization	
	1.4 Data Structures	
	1.5 Data Structure Operation	
	1.6 Algorithms; Complexity; Time- space Tradeoff	
2.	Preliminaries	3
	2.1 Introduction	
	2.2 Mathematical notation and Functions	
	2.3 Algorithmic Notation	
	2.4 Control Structures	
	2.5 Complexity of Algorithms	
	2.6 Sub algorithms	
	2.7 Variables	
	2.8 Data Types	
3.	String Processing	5
	1.1 Introduction	

1.2	Basic Terminology	
1.3	Storing Strings	
1.4	Character Data Type	
1.5	String Operation	
1.6	Work Processing	
1.7	Pattern matching Algorithms	
4.	Arrays, Records and Pointers	8
1.1	Introduction	
1.2	Linear Arrays	
1.3	Representation of Linear Arrays in Memory	
1.4	Traversing Linear Arrays	
1.5	Inserting and Deleting	
1.6	Sorting; Bubble Sort	
1.7	Search; Linear Search	
1.8	Binary Search	
1.9	Multidimensional Arrays	
1.10	Pointers; Pointer Arrays	
1.11	Records; Record Structures	
1.12	Representation of Records in Memory; parallel Arrays	
1.13	Matrices	
1.14	Spares Matrices	
5.	Linked Lists	5
5.1	Introduction	
5.2	Linked Lists	
5.3	Representation of Linked Lists in Memory	
5.4	Traversing a Linked List	
5.5	Searching a Linked List	
5.6	Memory Allocation Garbage Collection	
5.7	Insertion into a linked list	
5.8	Deletion from a Linked List	
5.9	Header Linked Lists	
5.10	Two –Ways Lists	

6.	Stacks, Queues, Recursion	6
6.1	Introduction	
6.2	Stacks	
6.3	Array Representation of Stacks	
6.4	Arithmetic Expression; Polish Notation	
6.5	Quicksort, an Application Stakes	
6.6	Recursion	
6.7	Towers of Hanoi	
6.8	Implementation of Recursive Procedures by Stacks,	
6.9	Queues	
6.10	Defuse	
6.11	Priority Queues	
7.	Trees	5
7.1	Introduction	
7.2	Binary Trees	
7.3	Representing Binary Trees in Memory	
7.4	Traveling Binary Trees	
7.5	Traversal Algorithms using Stacks	
7.6	Header Nodes; Threads	
7.7	Binary Search Trees,	
7.8	Trees, Searching and Inserting in a Binary Search Tree	
7.9	Deleting in a Binary Search Tree	
7.10	Heap, Heapsort	
7.11	Path Lengths; Huffman's Algorithm	
7.12	General Trees	
8.	Graphs and Their Application	4
8.1	Introduction	
8.2	Graph Th. Terminology	
8.3	Sequential Representation of Graphs; Adjacency matrix, path matrix	
8.4	Warshall's Algorithm, Shortest Paths	
8.5	Linked Representation of a Graph	
8.6	Operations on Graphs	

8.7	Traversing a Graph	
9.	Sorting and Searching	5
9.1	Introduction	
9.2	Sorting	
9.3	Inserting Sort	
9.4	Selection Sort	
9.5	Merging	
9.6	Merge-sort	
9.7	Radix Sort	
9.8	Linear searching	
9.9	Binary searching	
9.10	Interpolation searching	
9.11	Hashing	
10.	Introduction to File Organization	2
	Sequential, Index-Sequential and Direct file Organization	

		45

Practical

Program Related to

1. Creation of singly & doubly linked list
2. Insertion, deletion and updation of (1) above
3. Creation of stack, queue and incertion/deletion operation on Stack/Queue
4. Conversion amongst infix, prefix & postfix expressions
5. Creation of tree and insertion/deletion of a node
6. Tree traversal problem
7. Graph search algorithms
8. Searching & Sorting Algorithm

REFERENCE BOOKS:

1. Data Structures - by Seymolur Lipschutz (Schaum Series)
2. Fundamentals of Computer Algorithms – by Horowitz,E & Sahani, S – Galgotia Pub.
3. Data Structures Theory Applications - by Trembly & Sorenson, TMH

LIST OF EQUIPMENT

Hardware : Stand alone PC]
(for detail, please refer Annex – I)

Software : C / C++ Compiler

NETWORK ESSENTIALS	
Course code: IT402	Semester : Fourth
Teaching Scheme	Maximum Marks : 150
	PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks Sessional 25
Tutorial: 0 hrs/ week	Assignment/Quiz etc./Attendance: 15 Marks
Practical : 2 hrs / week	End Semester Theory Exam: 75
Credit : 4	End Semester Practical Exam: 25
Rationale / Aim :-	
This course provides the detail knowledge and skill set to the student regarding data communication and networking. It provides an in-depth knowledge regarding design and implementation of network. It also enhances the psychomotor skill set related to passive network component installations. Moreover it provides an introductory knowledge about the information security	

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1	Introduction to Computer Networking and Internetworking 1.1 Concept of data and information 1.1.1 Data Representation: various codes 1.1.2 Concept of Bit, Byte, Word, 1.1.3 Basic of communication-simplex, Half Duplex Full Duplex 1.1.4 Channel Allocation, Switching Circuit and Packet 1.1.5 Data Transfer Rate / Bandwidth. 1.1.6 Multiplexing	6
2	Network Topology Network Topology for LAN-bus, ring, star Network Topology for WLAN- Adhoc and infrastructure Network Topology for MAN and WAN – hierarchical, mesh, peer-to-peer.	5
3	OSI Reference Model The seven layer Architecture – Physical Layer, Medium Access Sub layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer and Application Layer	8
4	Concept of LAN and VLAN LAN Architecture, Topologies, Protocols Concept of VLAN, VLAN Routing Concept of Switching.	6

5	TCP/IP	12
	Overview of TCP/IP	
	TCP/IP Stack and OSI Reference Model	
	The four Layer TCP/IP Architecture	
	Internet Protocol	
	IP Addressing IPv4, IPv6, CIDR, Subnetting and Supernetting	
	Internet Routing Protocols – RIP, OSPF, BGP (conceptual level)	
6	Information Security	5
	Basic concept of information security	
	Data confidentiality, Data integrity, Data availability and Non-Repudiation.	
	Authentication and encryption techniques.	
	Firewall, Proxy and Tunneling	
	Virtual Private Network (VPN)	
7	Concepts of internet and www , Domain Name Space (DNS), HTML and XML.	3
	Total	45

Suggested List of Laboratory Experiments :-

Expt No	Laboratory Experiments to perform
1	Study and describe the differences between centralised distributed and collaborative computing. (Students may be told to identify from given specification of system).
2	Case studies of LAN, MAN, WAN
3	Study and describe client, server, peers (identify from given specification)
4	Study network services - remote login, telnet, ftp (Either from internet or a network being made available)
5	Determine how a specific network service is affected given a network architecture (centralised and distributed).
6	Demonstrate different transmission media Twisted pair, Co-axial cables, Wireless, Identify advantages and disadvantages
7	Identify, describe - Network connectivity devices like Media connector, Interface boards, Modems, Repeaters, Hubs, Switch, Bridges, Multiplexer, Routers
8	Study main protocols through Windows 95/98/NT (any two in details) (TCP/IP, SLIP, PPP, FDDI, X.25, ISDN, ATM)
9	Laboratory setting-up of Ethernet, installation of Ethernet card and testing
10	Design LAN and VLAN
11	Configure Network Server Windows NT, Server installation, network printing, network application, client server
12	Configure Network Clients
13	Preventing Problems in a Network

- Physical, electrical, virus, worm security
- 14 Troubleshooting
Isolating a problem, recovery from disaster, study of Tools, terminators, cable protocol analysers
- 15 Network Administration

Text /Reference Books:

Name of Authors	Titles of the Book	Name of the Publisher
A. S. Tanenbaum	1. Computer Network – by	PHI
W. Stallings	2. Data Communication & Computer Networks	PHI
Charles M. Kozierok	TCP/IP Guide	No Starch Press

OPERATING SYSTEMS		
Course code: IT409		Semester : Fourth
Teaching Scheme		Maximum Marks : 150
		PA and End Examination Scheme
Theory : 3 hrs/week		Class test: 10 Marks Sessional 25
Tutorial: NIL		Assignment/Quiz etc./Attendance: 15 Marks
Practical : 2 hrs/week		End Semester Theory Exam: 75
Credit : 4		End Semester Practical Exam: 25
Rationale / Aim :-		
The aim of this course is to provide an overall concept regarding the operating system. The student will interact with various management techniques that are very crucial for the management of the various hardware and software computing resources. Techniques related to resource management and algorithm will be discussed at length for better knowledge and skill-sets.		
Unit	Topic	Total Hrs
Unit -1	Introduction 1.1 Definition of O.S. 1.2 History of O.S. 1.3 Concepts 1.3 Structure	3
Unit -2	Processes 2.1 Definition of process and threads. 2.2 Interprocess communication. 2.3 Classical IPC problems. 2.4 Process scheduling.	4
Unit -3	Process Scheduling Algorithm 3.1 Resident Monitor(Single user) 3.2 Multi user system 3.3 Time sharing system 3.4 FIFS 3.5 Round Robin Fashion/Time quantum. Concept. 3.6 Multiple queues 3.7 Priority queues 3.8 Shortest job first	7
UNIT-4	Memory Management 4.1 Resident Monitor 4.2 Multiple Partition 4.3 Garbage collection and compaction 4.4 Paged memory management 4.5 Page Replacement Algorithms 4.6 Swapping 4.7 Segmentation 4.8 Segmented paged memory management 4.9 Demand paged memory management 4.10 Virtual Memory	8

UNIT-5	File Systems 5.1 Concept of Files & Directories 5.2 File System Implementation 5.3 Security Issues in Files 5.4 Protection Mechanisms 5.5 Case studies of Unix file system	4
UNIT-6	Input/Output 6.1 Principles of I/O Hardware 6.2 Principles of I/O Software 6.3 Disk 10.4 Clocks 6.5 Serial and Parallel port access 6.6 Terminal Access	3
UNIT-7	Device Management 7.1 Techniques for Device Management – Dedicated, shared, virtual 7.2 Device allocation considerations I/O traffic control & I/O Schedule, I/O Device handlers 7.3 SPOOLing	4
UNIT-8	Dead Locks 8.1 Concept of deadlock 8.2 Resources 8.3 Deadlock Prevention : Banker Algorithm & Safety Algorithm 8.4 The Ostrich Algorithm 8.5 Deadlock Detection and Recovery 8.6 Deadlock Prevention	5
UNIT-9	Distributed O.S 9.1 Definition 9.2 Types of Distributed O.S 9.3 Workstation server model 9.4 The processor pool model 9.5 The hybrid model 9.6 Case study SUN NFS File Server	4
UNIT-10	Case Studies 10.1 UNIX & LINUX O.S 10.2 MS-DOS & WINDOWS XP 10.3 WINDOWS -NT	3
Total		45

Practical

Total Period : 30

Periods : 2 P/W

UNIX

1. Overview of UNIX /Linux

UNIX / Linux as an Operating system, Kernel, Shell and User, UNIX File System, Files and Directories, Access permission, File system hierarchy

2. Basic UNIX / Linux Commands

Listing of files and directories, Copying, Deletion, Renaming and Comparing files, Creation, Navigation and Removing directories, Access permission of files and directories, Editors in UNIX,

Status of users, terminals, date and time, Displaying blown-up message, Paging and printing of files, Background jobs

3.Advance Features of UNIX

I-nodes, Trees, Pipes and Filters, Cutting, Pasting and Sorting of files, Searching for a pattern in a string

4.Programming with the Shell

System variables and shell variables, Interactive shell scripts, shell termination, Conditional statements, Looping statements, Special parameters in shell Computation and string handling

Name of Authors	Titles of the Book	Name of the Publisher
John Donovan	System Programming	TMH
D. M. Dhamdhare	Introduction to System Software	TMH
Madnick and Donovan	Operating System	
A. Silberschatz and P. Galvin	Operating System Concepts	ADP
Kernighan & Pike	The UNIX Programming Environment	PHI
Sumitabha Das	UNIX – Concepts & Application	TMH

LIST OF EQUIPMENT

Hardware :Unix / Linux Server with Clients or Linux Clients or Standalone PC

(for detail, please refer Annex – I)

Software :Unix / Linux Operating System

PRINCIPLES OF TELECOMMUNICATIONS		
Course code: IT403		Semester : Fourth
Teaching Scheme		Maximum Marks : 150
		PA and End Examination Scheme
Theory : 3 hrs/week	Class test: 10 Marks Sessional 25	
Tutorial: 1 hrs/ week	Assignment/Quiz etc./Attendance: 15 Marks	
Practical : 2 hrs / week	End Semester Theory Exam: 75	
Credit : 5	End Semester Practical Exam: 25	
Rationale / Aim :-		
This course provides the detail knowledge and skill set to the student regarding communication engineering. It provides an in-depth knowledge regarding design and implementation of Communication systems. It also enhances the psychomotor skill set related to component installations.		
Contents (Theory)		Total Hrs
Unit -1	Introduction to Electronics Communication Importance of Communication – Elements of a communication system- types of electronic communication – electromagnetic spectrum – bandwidth – basic idea of Fourier series and Fourier transforms	4
Unit -2	Analog Modulation 2.1 Concept and necessity of modulation 2.2 Definition of Amplitude, Frequency and Phase Modulation 2.3 Derivation of side bands in AM systems – Evaluation of Power – sideband depth – percentage of modulations 2.4 Expression of side bands in FM and PM systems and its interpretations – Modulation index and bandwidth requirement 2.5 Comparison of AM, FM and PM 2.6 Basic ideas of Pulse Amplitude Modulation (PAM), Pulse Width Modulation (PWM) and Pulse Position Modulation (PPM) - Principles of generation and reception of PAM, PWM and PPM with block diagrams and their applications.	8
Unit -3	Transmitting Systems 3.1 Block diagram and function of different stages of AM and FM broadcast. 3.2 Working principles of SSB systems with block diagram: Filter Method – Phase Shift Method – Third method	5
UNIT-4	Demodulation 4.1 Principle of detection with diode detector 4.2 AGC Circuit, Delayed AGC 4.3 Foster-Seeley discriminator – Ratio Detector – Limiter – Standard AFC Circuits (basic principles only, no derivation) , PLC	4

UNIT-5	Receiving System 5.1 Block diagram and principle of operation of super heterodyne receiver - IF amplifier and choice of IF – Mixer and Convertor – Alignment and Tracking – Tone and Volume control - Band spreading - Receiver Characteristics - Testing . 5.2 Block diagram and principle of operation of FM receiver – Pre-emphasis and De-emphasis – AFC and Alignment of FM receiver	5
UNIT-6	Pulse Code Modulation 6.1 Idea of digital communication – Advantages of digital communication over analog communication 6.2 Basic steps in PCM systems: Filtering – Sampling – Quantization – Encoding 6.3 Block schematic description of transmitter and receiver of PCM system 6.4 Principles of Linear and non – linear quantization – companding , DPCM	6
UNIT-7	Delta Modulation 7.1 Block schematic description of delta modulation technique. 7.2 Limitations of delta modulation- slope overload and granular noise. 7.3 Concept of adaptive delta modulation technique	3
UNIT-8	Multiplexing 8.1 Idea of multiplexing and its necessity. 8.2 Types of multiplexing: TDM and FDM 8.3 PCM-TDM in modern applications TI Carrier. 8.4 Merits and demerits of TDM and FDM.	5
UNIT-9	Basic Telephony 9.1 Telephone transmitter – Receiver – Dial tone, side tone and antisidetone circuits – Handset – Ringer – Switch book – Hybrid – Local loop – Tone dialling – DTMF, SPC	5
Total		45

Total Periods : 30

Classes : 2 P/W

LIST OF EXPERIMENTS

- To study the amplitude modulation and demodulation technique.
- To study the frequency modulation and demodulation technique.
- To study the frequency spectrum of AM and FM with the help of spectrum analyzer.
- To study the analog signal sampling and reconstruction of the effect of: —
 - different sampling frequencies on reconstructed signals;
 - varying duty cycle of sampling frequency on the amplitude of reconstructed signal.
- To study some radio receiver measurements: (a) sensitivity, (b) selectivity and (c) fidelity.
- To study EPABX:
 - to study the electrical behaviour of different tones – dial tone, ringing tone, ring back tone and busy tone (both subscriber and exchange);
 - to study some extension features-redial, burgling, extension privacy, call forwarding, follow me etc.

REFERENCES BOOKS:

1. Communication Electronics by Frenzel, Tata McGraw-Hill
2. Electronic Communication System by Kennedy, Tata McGraw-Hill
3. Principles of Communication System by Taub & Schilling, Tata McGraw-Hill
4. Electronic Communication by Roddy & Coolen, Prentice Hall of India, N. Delhi
5. Communication System by Simon Haykin, Wiley Ltd.
6. Telemetry Principles by D. Patranabis, Tata McGraw-Hill
7. Electronic Communication System by Dungan, Vikash Publishing House

ENTREPRENEURSHIP DEVELOPMENT
(Softcore-II)

L T P
3 0 0

Curri. Ref. No.: G302

Total Contact hrs.:

Total marks: 100

Theory:

Theory: 45

End Term Exam: 75

Tutorial :0

P.A.: 25

Practical: 0

Credit: 3

RATIONALE

The course intends to provide the fundamental aspects of entrepreneurship as a means for self-employment and culminating in economic development of the country. It deals with basic issues like entrepreneurial characteristics and quality, governmental policy support and overall scenario along with opportunities and the facilities available for entrepreneurship development.

DETAIL COURSE CONTENT

THEORY:

UNIT TOPIC / SUB-TOPIC		Total Hrs.
1.0	INTRODUCTION	10
1.1	Definition and functions of Entrepreneur, entrepreneurship quality, entrepreneurial spirit, need for entrepreneurship.	
1.2	Individual and social aspects of business – achievement motivation theory	
1.3	Social responsibilities of Entrepreneurs	
2.0	FORMS OF BUSINESS ORGANISATION	4
2.1	Types of company	
2.2	Merits and demerits of different types	
2.2	Registration of small scale industries	
2.4	Conglomeration.	
3.0	SMALL SCALE AND ANCILLARY INDUSTRIES	8
3.1	Definition – scope with special reference to self employment.	
3.2	Procedure to start small scale and Ancillary industries	
3.3	Pattern on which the Scheme/Project may be prepared	
3.4	Sources of finance - Bank, govt., and other financial institutions.	
3.5	Selection of site for factory	
3.6	Factors of selection	

- 3.7 N.O.C. from different authorities, e.g., Pollution Control Board, Factories Directorate etc.
- 3.8 Trade License.

4.0 SYSTEM OF DISTRIBUTION 1

- 4.1 Wholesale Trade
- 4.2 Retail trade

5.0 SALES ORGANISATION 3

- 5.1 Market survey, marketing trends, knowledge of competitors, product selection & its basis .
- 5.2 Sales promotion
- 5.3 Advertisement
- 5.4 Public relations and selling skills

6.0 PRICING THE PRODUCT 1

- 6.1 Basic guidelines

7.0 INTRODUCTION TO IMPORT AND EXPORT 6

- 7.1 Procedures for export
- 7.2 Procedures for import
- 7.3 Technical collaboration – international trade
- 7.4 Business insurance
- 7.5 Rail and road transport
- 7.6 Forwarding formalities, FOR, FOB, CIF, etc.

8.0 BUSINESS ENQUIRIES 4

- 8.1 Enquiries: From SISI, DIC, SFC Dept. of Industrial Development Banks.
- 8.2 Offers and Quotations
- 8.3 Orders

9.0 PROJECT REPORT 6

- 9.1 Project Report on feasibility studies for small scale industries, proposal for finances from bank and other financial institutions for establishing new industries and its extension, obtaining License enlistment as suppliers, different vetting organizations for Techno Economic feasibility report.

Breakeven analysis, Breakeven point.

10.0 ENVIRONMENT LEGISLATION 2

- 10.1 Air Pollution Act
- 10.2 Water Pollution Act
- 10.3 Smoke Nuisance Control Act

SUGGESTED LEARNING RESOURCES:

Reference Books:

1. Entrepreneurship Development
Prepared by CTSC Manila Publishers by Tata Mc Graw Hill Publishing Co. Ltd.
2. Small Enterprise Management Published by ISTE, Mysore
3. Motivation Published by ISTE, Mysore
4. S.S.M. in Environmental Engineering Published by ISTE, Mysore
5. Entrepreneurship New Venture Creations, Holt, Prentice Hall, India.
6. Essence of TQM by John Bank
7. Rathore, B.S. and J.S. Saini(ed), A Handbook of Entrepreneurship – Panchkula : Aapga, 1997
8. Jose Pauletal, Entrepreneurship Development, Mumbai : Himalaya Publishing House, 1996
9. Khanka, S.S., Entrepreneurship Development, New Delhi : S. Chand and Co., 2001
10. Nagarazan, R.S. and A.A. Arivalagar, TQM New Delhi : New Age International Publishers, 2005
11. Bhatia, R.C., Marketing Communication and Advertising, New Delhi : Galgotia Publishing Co., 2003
12. Sinha, J.C., and V.N. Mugali : A Textbook of Commerce, New Delhi : R. Chand and Co., 1994

PROFESSIONAL PRACTICES - III		
Course code: IT509		Semester : Fourth
Teaching Scheme		Maximum Marks : 50
		PA and End Examination Scheme
Theory : NIL		Class test: 0 Marks Sessional 50
Tutorial: NIL		Assignment/Quiz etc./Attendance: 0 Marks
Practical : 2 hrs / week		End Semester Theory Exam: 0
Credit : 1		End Semester Practical Exam: 0
Rationale / Aim :-		
Interact with industry is essential for proper understanding about implementation procedure of the theoretical knowledge gained during course of study. The course content of professional practice-III is designed to develop interpersonal skill and adoptability to the industry so that the student will be benefited in their professional carrier.		
	Contents (Theory)	Total Hrs
UNIT - I	1.0 Industrial Visits Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form a part of the term work. Industrial visits may be arranged in the relevant areas/industries	
UNIT-II	2.0 Lectures by Professional / Industrial Experts be organized from ANY ONE of the following areas: <ul style="list-style-type: none">• Networking• Web Designing / PC Assembling	
Total		

DEVELOPMENT OF LIFE SKILL- II	
SUBJECT CODE: G302	
Teaching Scheme	Maximum Marks : 50
	PA and End Examination Scheme
Theory : 1 hrs/week	Class test: 0 Marks
Tutorial: 0 hrs/week	Assignment / Quiz etc.: 0 Marks Attendance :0 Marks Sessional: 25marks
Practical : 2 hrs/week	End Semester Theory Exam:
Credit : 2	End Semester PA Exam: 25 Marks
Rationale:	
<p>The nature of organizations is changing at very rapid speed in this competitive world. In this situation the responsibility of diploma holder is not unique. He will be a part of a team in the organization. As such the individual skills are not sufficient to work at his best.</p> <p>This subject will develop the student as an effective member of the team. It will develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team.</p> <p>Such skills will enhance his capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems.</p> <p>The subject is classified under Human Science.</p>	

Module/Unit After completion of the course, students will be able to:

1. Apply task management techniques for given projects
2. Enhance leadership traits
3. Resolve conflict by appropriate method
4. Apply problem solving skills for a given situation
5. Apply techniques of effective time management
6. Face the interview without fear
7. Convince people to avoid frustration
8. Follow moral and ethics

TERM - V

OBJECT ORIENTED PROGRAMMING IN JAVA

L *T* *P*
4 1 2

Curri. Ref. No.: IT504

Total Contact hrs: 105

Total marks: 150

Theory: 100

Theory: 60

End Term Exam: 75

Tutorial: 15

P.A.: 25

Practical: 30

Practical: 50

Pre requisite: IT503

End Term Exam: 25

Credit: 6

P.A : 25

Theory

Total Periods : 60

Periods : 4 P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.0	INTRODUCTION TO JAVA	3
1.1	A brief History of Java.	
1.2	Why Java is popular for Internet.	
1.3	Java Applets and Applications	
1.4	Security	
1.5	Portability	
1.6	Java components	
	1.6.1 The byte code	
	1.6.2 Java Development kit (JDK)	
1.7	Java Virtual Machine (JVM)	
2.0	JAVA LANGUAGE FEATURES	5
2.1	Java Control structure	
2.2	Character set, Constants, Variables, Data types, Operators (Arithmetic, Relational, Logical, Conditional, Bit-wise, Special) Expressions (Arithmetic, Logical)	
2.3	Branching statements	
	i. Simple if statement	
	ii. If-else statement	
	iii. Switch – case statement	
2.4	Looping	
	2.4.1 While loop	
	2.4.2 Do – while loop	
	2.4.3 For loop	
2.5	Jump statement	
	2.5.1 Break & Continue	
3.0	INTRODUCING CLASSES	7
3.1	Class fundamentals	

	<ul style="list-style-type: none"> i. The general form of a class ii. A simple class 	
3.2	Declaring Objects	
3.3	Introducing Methods	
	3.3.1 Adding a method that takes parameters	
	3.3.2 Returning a value	
3.4	Constructors	
	3.4.1 Parameterized constructors	
3.5	The this keyword	
	3.5.1 Instance variable Hiding.	
3.6	Garbage collectors.	
3.7	The finalize() method.	
3.8	Overloading Methods, constructors	
3.9	Using objects as parameters.	
3.10	Concept of Nested and Inner classes	
3.11	Access control parameters such as public, protected and private.	
4.0	WRAPPER CLASSES OF JAVA	5
4.1	Type casting wrapper classes	
	4.1.1 Boolean, Character, Double, Float, Integer and Long	
4.2	Study of string classes and methods	
	4.1.2 Type conversion (toUpperCase, toLowerCase), Replace(), Equals(), Length(), CharAt() and CompareTo()	
5.0	INHERITANCE	8
5.1	Inheritance Basics	
5.2	Member Access and Inheritance	
5.3	A super class variable can reference a subclass object.	
5.4	Using this and super for member and constructor references.	
5.5	Creating a multilevel hierarchy.	
5.6	Method overloading	
5.7	Using final with Inheritance.	
5.8	Multiple Inheritance using Interfaces.	
	5.8.1 Using Java Interfaces.	
	5.8.2 Defining Interfaces.	
	5.8.3 Implementing Interfaces.	
	5.8.4 Applying Interfaces.	
	5.8.5 Variable in Interfaces.	
	5.8.6 Interface to implement call back functions.	
6.0	EXCEPTION HANDLING	8

- 6.1 Fundamentals.
- 6.2 Types of exception handling.
- 6.3 Why use exception handling.
- 6.4 Hierarchy
- 6.5 Exception handling constructs
- 6.6 Try-Catch-Finally
- 6.7 Throw statements
- 6.8 Throws clause
- 6.9 Creating your own exception class.

7.0 MULTITHREADED PROGRAMMING

8

- 7.1 **What are threads?**
- 7.2 Why use thread.
- 7.3 Creating and running thread.
- 7.4 Implementing Runnable.
- 7.5 Extending thread.
- 7.6 Synchronization.
 - Synchronization Methods and statements.
- 7.7 Creating multiple Threads
 - 7.7.1 Thread synchronization.
 - 7.7.2 Inter thread communication
 - 7.7.3 Priorities and scheduling.
 - 7.7.4 Thread local variables

8.0 JAVA APPLETS

8

- 8.1 Applet Basics
 - 8.1.1 The Applet class
 - 8.1.2 Applet architecture.
- 8.2 An Applet skeleton
 - 8.2.1 Applet Initialization and termination
- 8.3 Simple Applet Display Methods.
 - 8.3.1 Requesting repainting
 - 8.3.2 Using the status window
 - 8.3.3 HTML APPLET tag
 - 8.3.4 Passing parameters to Applet
 - 8.3.5 get DocumentBase() and get CodeBase() , showDocument()

9.0 EVENT HANDLING AND AWT

8

- 9.1 Layout control

- 9.2** Delegation Event Model:
Events., Event sources, Event Listeners.
- 9.3** Event classes and Event Listener Interfaces.
 - 9.3.1 Action Event, Adjustment Event, Component Event, Container Event, Focus Event, Input Event, Item Event, Key Event, Mouse Event, Text Event, Window Event, and Menu Event
- 9.4** AWT controls
 - 9.4.1 Control Fundamentals
 - 9.4.2 Adding and removing controls
 - 9.4.3 Responding to controls
- 9.5** Auto Tools Buttons
 - 9.5.1 Creating and using Buttons
 - 9.5.2 Labels
 - 9.5.3 Checkboxes and Radio Buttons.
 - 9.5.4 Choices
 - 9.5.5 Creating and using Choices.
 - 9.5.6 Lists.
 - 9.5.7 Creating and using lists.
 - 9.5.7 Scrollbars.
 - 9.5.8 Creating and scrollbars.
 - 9.5.9 Text field and Text Area.
 - 9.5.10 Creating Text field and Text Area.
 - 9.5.11 Using Text field and Text Area.

Practical

Total Periods : 30

Periods : 2 P/W

List of Practicals

- Program based on Basics. (At least 5)
- Program using if, Nested if, Switch, loops & breaking loop statements.
- Program that define classes, create objects, add methods.
- Develop a program for each

- Type caste
 - Wrapper
 - String
 - Vector class.
- Programs to design and inheriant and interface.
 - Program to handle an exception by using by Try-Catch-Finally
 - Program to generate own exception class
 - Programs by using multi-threading concept (At least 2)
 - Program using Applet tag in HTML file.
 - Writing simple programs on Applet.
- Design a form using AWT tool.
 - Write a program on applet using buttons.

REFERENCE BOOKS

1. Java 3e 2007 E Balagrusawmy, Tata McGraw Hills Publishing Co.l Ltd. N. Delhi
2. OOP through Java 2007 ISRD, Group Tata McGraw Hills Publishing Co.l Ltd. N. Delhi.
3. The Complete Reference - Java 23rd edition Herbet Schildt Tata McGraw Hills Publishing Co.l Ltd. N. Delhi
4. Mastering Java-2 Latest John Zukonshi BPB Publications B-14, CONNAUGHT PLACE, New Delhi-110001
5. Using Java-2 platform Joseph L Weber PHI (Eastern Economy Edition)

LIST OF EQUIPMENT

1. Hardware : Unix/Windows based PC (for detail, please refer Annex – I)
2. Software : Java compiler / Visual Java.

SOFTWARE ENGINEERING

L *T* *P*
3 1 0

Curri. Ref. No.: IT407

Total Contact hrs.: 60

Total marks: 100

Theory: 100

Theory: 45

End Term Exam: 75

Tutorial: 15

P.A.: 25

Practical: 0

Practical: 0

Pre requisite: NIL

End Term Exam: 0

Credit: 4

P.A : 0

Theory

Total Period : 45

Period : 3 P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.0	Introduction to Software Engineering	4
	1.1 The evolving role of software	
	1.2 Software crisis-problems and causes	
	1.3 Software engineering paradigms	
	1.4 Classic life cycle	
	1.5 Prototyping	
	1.6 Spiral Model	
	1.7 Generic view of software engineering	
2.0	Software Requirement Analysis	6
	2.1 Requirement analysis fundamentals	
	2.2 Structured analysis : Basic notation and its extension, object oriented analysis and data modeling, process modeling	
3.0	Software Design	5
	3.1 Evolution of software design	
	3.2 Design fundamentals: Abstraction, refinement, modularity, software architecture	
	3.3 Flow oriented design and object-oriented design	
4.0	Quality Assurance	4
	4.1 Software quality factor	
	4.2 Software quality Assurance (SQA)	
	4.3 SQA activities	
	4.4 Software reliability, errors and faults	
	4.5 Software reliability models	
5.0	Verification and Validation	3
	5.1 Software testing strategies & techniques	

5.2 Elementary ideas of black box & white box testing	
6.0 Software Evaluation	2
7.0 Software Documentation	3
8.0 Software Project Management	15
8.1 Basic concepts of software project management process objectives, scope, estimation, COCOMO model	
8.2 Project planning	
8.3 Project scheduling, Gantt chart, pert chart	
8.4 Managing people, project staffing, group working, working environment	
8.5 Project monitoring, milestone, methods of project monitoring	
8.6 Risk analysis, tracking and control, version management	
9.0 Case Tools :	3
Rational University Seed Programme (Rational Rose)	-----
	45

REFERENCE BOOKS

1. Software Engineering Beginners Approach – by Pressman – TMH
2. Software Engineering – by Pankaj Jalote – Narosa Pub. House
3. Fundamentals of Software Engg- Carlo Ghezzi, Mehdi Jazayeri, & Dino Mandrioli – PHI.
4. Software Engineering – by Sommerville – Addison-Wesley

INTERNETWORKING & WEB TECHNOLOGY

L T P
3 1 3

Curri. Ref. No.: IT 512

Total Contact Hrs: 105

Total marks: 150

Theory: 100

Theory: 45

End Term Exam: 75

Tutorial: 15

P.A.: 25

Practical: 45

Practical: 50

Pre requisite: IT402

End Term Exam: 25

Credit: 5

P.A : 25

Theory

Total Period : 45

Period : 3 P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.	Internet Fundamentals	4
	1.1 Motivation for internetworking	
	1.2 History and scope of internet	
	1.3 Internet protocol and standardization	
	1.4 Role of ISP & Factors for choosing an ISP	
	1.5 Internet service providers in India	
	1.6 Types of connectivity such as Dial Up, Leased, VSAT etc.	
	1.7 Internet server and client modules on various operating systems	
2.	TCP/IP	13
	2.1 TCP/IP internet layering model	
	2.2 Reliable stream transport service (TCP)	
	2.2.1 Need for stream delivery	
	2.2.2 Properties of reliable delivery service	
	2.2.3 Providing reliability	
	2.2.4 Idea behind slide windows	
	2.2.5 Ports connections and end points	
	2.2.6 Segment, stream, sequence number	
	2.2.7 TCP segment format	
	2.2.8 TCP header	
	2.2.9 TCP Checksum computation	
	2.2.10 Acknowledgement and retransmission	
	2.2.11 Time out and retransmission	
	2.2.12 Response to congestion	
	2.2.13 Establishment of a TCP connection	
	2.2.14 Source and destination address	
	2.2.15 Protocol number	
	2.2.16 Checksum	
	2.2.17 Closing TCP connection	
	2.2.18 TCP connection reset	
	2.3 Connection less data gram delivery (Internet Protocol)	
	2.3.1 Concept of unreliable delivery	
	2.3.2 Connection less delivery system	
	2.3.3 Purpose of internet protocol	

- 2.3.4 IP header
- 2.3.5 Source and destination address
- 2.3.6 Protocol number
- 2.3.7 Checksum
- 2.3.8 Routing in an internet
- 2.3.9 Direct and indirect delivery
- 2.3.10 Table driver IP routing
- 2.3.11 Default roots
- 2.3.12 Post specific roots
- 2.3.13 Rooting with IP address
- 2.3.14 Obtaining a subnet mask
- 2.3.15 Benefits of TCP/IP
- 2.4 Subnet Address Extension
 - 2.4.1 Introduction to subnet address extension
 - 2.4.2 Minimizing network numbers
 - 2.4.3 Transparent routers
 - 2.4.4 Subnet Addressing
 - 2.4.5 Flexibility in subnet address assignment
 - 2.4.6 Implementation of subnet with mask
 - 2.4.7 Subnet mask representation
 - 2.4.8 Routing in the presence of subnet
- 2.5 User Data gram Protocol
 - 2.5.1 Introduction to UDP
 - 2.5.2 Identifying the ultimate destination
 - 2.5.3 Format of UDP message
- 2.6 Domain Name System
 - 2.6.1 Internet addressing
 - 2.6.2 IP address/domain name address; why both
 - 2.6.3 Mapping of domain name to address
 - 2.6.4 Domain name resolution
 - 2.6.5 Efficient translation
 - 2.6.6 Abbreviation of domain name
 - 2.6.7 Obtaining authority for a sub domain

3. **Internet Applications and Services**

5

- 3.1 Email
 - 3.1.1 Email networks
 - 3.1.2 Email protocols
 - 3.1.3 Format of an email message
 - 3.1.4 Email routing
 - 3.1.5 Email clients, POP3, IMAP
- 3.2 FTP
 - 3.2.1 Public domain software
 - 3.2.2 Types of FTP servers
 - 3.2.3 FTP clients
- 3.3 Telnet
 - 3.3.1 Telnet protocol
 - 3.3.2 Server domain
 - 3.3.3 Telnet clients
 - 3.3.4 Terminal emulation
- 3.4 Internet Relay Chat

	3.4.1	IRC network and servers	
	3.4.2	Channels	
4.		Cyber Security	6
	4.1	Overview of Cyber Security threats & Vulnerability	
	4.2	The need for computer security	
	4.3	Firewalls: introductory concepts & its requirement, IPS/ IDS	
	4.4	Specific intruder approach	
	4.5	Security strategies	
	4.6	Security tools and techniques	
	4.7	Encryption, Authentication,	
	4.8	ISO 27001: 2011 security compliance: integrity, confidentiality, availability.	
	4.9	Enterprise networking & access to Internet, Antivirus	
	4.10	Identity and Access Management	
5.		Switching, Routing & Enterprise LAN	14
	5.1	Introduction to Enterprise LAN	
	5.1.1	Design issues	
	5.1.2	Multiple VLAN Management	
	5.1.3	Network Zone Management	
	5.1.4	Inter VLAN Routing	
	5.2	Overview of Switches (L2)	
	5.2.1	Switch configuration	
	5.2.2	Core / Distribution / Access Switches	
	5.2.3	DHCP, STP, Link Aggregation and other Protocol assignment	
	5.2.4	Switch Traffic QOS.	
	5.3	Router Management	
	5.3.1	Routing protocols	
	5.3.2	Basic Router Management	
	5.3.3	Router configuration	
	5.4	Wireless LAN	
	5.4.1	Wireless Access Point – Standalone mode	
	5.4.2	Wireless LAN Controller (WC)	
	5.4.3	Access Point connected through WLC	
	5.5	Introduction to server VLAN Management	
6.		Search Engines	3
	6.1	Technology overview	
	6.2	Popular search engines	
	6.3	Registration of web site in a search engines	

Practical

Total Periods : 45

Periods :3 P/W

1. Installation of network components under Windows 2013/ LINUX
2. Installation of TCP/IP
3. Installation of Intranet
4. Configuration of one web server including Apache, ISS
5. Deployment of HTML files in Intranet servers
6. Practical on different Internet services (WWW, Mail, FTP, Chat)
7. Proxy server configuration using Linux server
8. Managed Switch configuration: VLAN, DHCP, Zone Management
9. Router configuration using static routes
10. Wireless Access Point configuration in standalone mode.

REFERENCE BOOKS

1. Internet working with TCP/IP Vol – I : principles, protocols and architecture – by Douglas E. Comer – PHI
2. Internet working with TCP/IP Vol – II : design, implementation and internals – by Douglas E. Comer & David L. Stevens – PHI
3. Internet working with TCP/IP Vol – III : client server programming and applications – by Douglas E. Comer & David L. Stevens – PHI
4. HTML : the definitive guide – by Chuck Musciano & Bui Kennedy - SPD
5. E-MAIL security : how to keep your electronic messages private – by Bruce Schneier – John Wiley
6. Dynamic HTML : the definitive reference – by Danny Goodman – SPD
7. Dynamic HTML in Action – by Schurman & Pardi – PHI/Microsoft Press

LIST OF EQUIPMENT

Hardware : Stand alone PC

(for detail, please refer Annex – I)

Managed Network Component like L2 Switch, Router, Access Point

Intel Xeon Based Server with 8 GB Ram and 300 GB of Disk Space (minimum)

Software : Web browser (Internet Explorer & Netscape Navigator) with internet connection

DATABASE MANAGEMENT SYSTEM

L *T* *P*
3 1 4

Curri. Ref. No.: IT405

Total Contact hrs.: 120

Total marks: 150

Theory: 100

Theory: 45

End Term Exam: 75

Tutorial: 15

P.A.: 25

Practical: 60

Practical: 50

Pre requisite: IT401,

End Term Exam: 25

Credit: 6

P.A : 25

Theory

Total Period : 45

Period : 3 P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.0	Introduction to Database Management System	5
	1.1 Database System environment	
	1.2 File oriented Approach	
	1.3 Database Approach	
	1.4 Users of DBMS	
	1.5 Intended use of DBMS	
	1.6 Benefit of using database approach	
	1.7 Concepts of Client Server Architecture and distributed system	
2.0	Database System Concept and Application	5
	2.1 Date Models, Schemes and instances	
	2.2 DBMS architecture and Independence	
	2.3 Database Languages and Interfaces	
	2.4 The database system environment	
	2.5 Classification of DBMS	
3.0	E-R diagram	2
	3.1 Defining relations, Entity Set	
	3.2 E-R Model concept with examples	
4.0	SQL	12
	4.1 Data definition in SQL	
	4.2 Queries in SQL	
	4.3 Create, Update, Insert statements in SQL	
	4.4 Views in SQL	
	4.5 Specifying additional constraints as assertions	
	4.6 Specifying indexes	
5.0	Functional Dependencies and Normalization for Relational Database	4

5.1 Functional dependencies	
5.2 Normal forms based on primary keys	
5.3 General definitions of second and third normal forms	
5.4 Boye Codd normal form	
6.0 Transaction Processing Concepts	3
6.1 Introduction to transaction processing	
6.2 Transaction and System concept	
6.3 Desirable properties of transactions	
6.4 Schedules and recover ability	
7.0 Concurrency Control Techniques	3
7.1 Basic Concepts; Concepts of Locks : live lock, dead lock; Serializability	
8.0 Security and Integrity	5
8.1 Security and integrity violation	
8.2 Authorization	
8.3 Authorization and Views	
8.4 Granting of Privileges	
8.5 Security specification in SQL	
8.6 Encryption	
9.0 Distributed Databases	6
Principles of distributed database; data fragmentations, transparency, integrity, allocation of fragments, translation of global query to fragment query; concurrency control – elementary ideas	-----
	45

Practical

Total Period : 60
Period : 4 P/W

- 1 Oracle**
 - 1.1 Introduction to Oracle
 - 1.2 Datatypes and attributes constraints, primary key, unique, foreign key, check, not null
- 2 Introduction to Structured Query Language (SQL)**
 - 2.1 Data definition language (DDL) - Create, alter, drop table
 - 2.2 Data manipulation language (DML) - Select, insert, update, delete
 - 2.3 Data control language - Grant, revoke
 - 2.4 Creating and deleting views, index
- 3 Introduction to PL/SQL**
 - 3.1 Block structure, variable and types, looping constructs, expression and operators, functions
 - 3.2 Cursors variable, cursor fetch, loops
 - 3.3 procedure, functions, triggers
 - 3.4 Error handling and exceptions 3.5 Composite datatypes

4. Developer 2000/IDS

4.1 Oracle forms - Form modules, blocks, items, windows, canvas views, triggers, master detail forms, menu, alert, LOV

4.2 Oracle reports – report generation with parameters

5. Visual Basic

5.1 Windows programming. Creation of forms, menus, etc

5.2 Basic Programming Constructs of Visual Basic-Array handling Common controls of Visual Basic-Creation of Label control, command button, textbox, checkbox, option button, frame, list box, combo box, scroll bars, timer, shape, line.

5.3 File System Control - Dirlist box, dDrivelist box, filelist box, and synchronization of above controls Common Dialog Controls, Connectivity with Databases (with RDBMS like Oracle), Ideas on implementing ODBC Object Orientation in Visual Basic, Creation of Active X Control using Visual Basic

6. DBA function :

5.1 Installation of Oracle & D2K

5.2 Creation of a database

5.3 Routine maintenance of database

5.4 Backup & Recovery of database

5.5 Concept of inet.ora

REFERENCE BOOKS

1. Fundamentals of Database System - by Elmasri and Navathe - Addison-Wesley
2. An Introduction to Database Systems – by C.J. Date – Addison-Wesley
3. Principles of Database Systems – by John E. Hopcroft & Jeffrey D. Ullman – Galgotia Pub.
4. Developing personal oracle7 applications – by David Lockman – Sams Pub.
5. Oracle8 DBA handbook – by Kevin Loney – TMH

LIST OF EQUIPMENT

Hardware : Unix/Windows based Client-Server environment (for detail, please refer Annex – I)

Software : Oracle & D2K/IDS (Latest Version)

BUSINESS DATA PROCESSING

L *T* *P*
3 1 4

Curri. Ref. No.: IT513

Total Contact Hrs: 120

Total marks: 150

Theory: 100

Theory: 45

End Term Exam: 75

Tutorial: 15

P.A.: 25

Practical: 60

Practical: 50

Pre requisite: NIL

End Term Exam: 25

Credit: 6

P.A : 25

Theory

Total Period : 45

Period : 3 P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1	INTRODUCTION 1.1 Introduction to Information - Time, Relevant, Precision	2
2	INFORMATION SYSTEMS AND BUSINESS CONTEXT 2.1 Organisation, 2.2 Technology, 2.3 Management	3
3	INFORMATION SYSTEMS IN MANAGEMENT 3.1 Types of information systems - Transaction processing system, Management information system, Decision support system, Executive information system, Office information system/knowledge work system	10
4	CATEGORIES OF INFORMATION SYSTEMS ON THE BASIS OF PROCESSING 4.1 Batch processing, 4.2 On-line processing, 4.3 Real-time processing.	3
5	DATA AND FILE CONCEPTS 5.1 File structures and data access - Sequential access, Direct access, Indexed sequential access	3
6	DATA MANAGEMENT 6.1 The requirement - Data redundancy, Maintaining consistency within the data collection, 6.2 Program-data interdependence, Flexibility in use of data and sharing data, 6.3 Data management trends	6

7	APPLICATIONS OF IS	12
	7.1 Inventory management,	
	7.2 Sales management,	
	7.3 Personnel management	

8	MANAGEMENT INFORMATION SYSTEM	6
	8.1 MIS services - Routine performance reports, Excepting reports, On-demand reports, Predictive reports	
	8.2 Implementing an MIS	

45

Practical

Total Period : 60

Period : 4 P/W

- 1) Study of the Management Information System in real environment.
- 2) Study & understanding of the business process activities.
- 3) Mapping of domain knowledge to Information system design
- 4) Feasibility study
- 5) Requirement analysis
- 6) Application of Object Oriented Modelling of Business Data Processing
- 7) Use of UML in design of system – use case diagram, activity diagram start chart, etc.
- 8) Implementation of USE case diagram in system design and development.

REFERENCE BOOKS

2. Management Information System – by S. Sadagopan – PHI
3. Management Information System – by S. Shajahan & R. Priyadarshini – New Age International
4. Management Information System – by R.K. Wadhwa – Kanishka Publishers

LIST OF EQUIPMENT

2. Hardware : Unix/Windows based PC (for detail, please refer Annex – I)
3. Software : Rational Rose / Open source UML Programming Package

PROFESSIONAL PRACTICES – IV

L T P
0 0 2

Curri. Ref. No.: IT510

Total Contact hrs : 30

Total marks: 50

Theory: 0

Theory: 0

End Term Exam: 0

Tutorial: 0

P.A.: 0

Practical: 30

Practical: 50

Pre requisite: NIL

End Term Exam: 0

Credit: 1

P.A.: 50

Practical

Total Periods: 30

Periods: 2P/W

Aim :- The course aims to equip students with basic knowledge and skills about Computer networking, data communication and troubleshooting of common problems.

Objective: - On completion of this course, the Student will be able to:

- Install different types of software
- Perform System maintenance & trouble-shooting
- Communicate between PC and other related device

Suggested List of activities to be done:

- Installation of Operating system and other software
- Installation of Open source software application
- Installation of database (SQL/MySQL)
- System maintenance and troubleshooting
- Communication between PC and other devices like mobile or palmtop through Bluetooth or other technologies.

SUGGESTED LEARNING RESOURCES

1. Computer Troubleshooting – by K. MacRae, G. Marshal, Haynes Publishing.
2. Handbook of Computer Troubleshooting – by M. Byrd, J. Pearson, R.A. Saigh, The Glen Lake Publishing Company.

TERM - VI

MULTIMEDIA TECHNOLOGY & APPLICATION

L *T* *P*
4 0 4

Curri. Ref. No.: IT 505

Total Contact hrs: 120

Total marks: 200

Theory: 100

Theory: 60

End Term Exam: 75

Practical: 60

P.A.: 25

Pre requisite: NIL

Practical: 100

Credit: 6

End Term Exam: 50

P.A : 50

Theory

Total Periods : 60

Periods : 4 P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.	Multimedia : Basic Overview	4
	1.1 Characteristics of Multimedia: multiple media, non-linearity, interactive, compatibility.	
	1.2 Hardware and software requirement (including audio and video systems)	
	1.3 Multimedia Application: entertainment, education & training, business, tourism and hospitality, medicine, design and engineering application.	
	1.4 Creation of multimedia document	
2.	Digital Media Representation	4
	2.1 Analog Representation	
	2.2 Digital Representation	
	2.3 Analog to Digital conversion and vice-versa	
	2.4 Sampling, sampling rate, Quantization and Quantization Error	
	2.5 Limitation of digital representation	
3.	Overview of Multimedia Building Blocks (text, image, graphics, audio, video)	2
4.	Animation	15
	4.1 Introduction and Background of Animation	
	4.2 Uses of Animation	
	4.3 Types of Animation – cell animation, path animation, 2D & 3D animation	
	4.4 Role of computers in animation	
	4.5 Key-frames and Tweening	
	4.6 Movement creation – coordinate system, transformations	
	4.7 Principles of Animations – squash and stretch, anticipations, staging, follow-through and overlapping , slow-in slow-out, arcs, timing, exaggeration, appeal, secondary action.	
	4.8 Animation Techniques – onion skinning, motion cycling, masking, flipbook animation, sound addition, rotoscoping and blue-screening, colour cycling.	
5.	Compression	14
	5.1 Need for Compression	
	5.2 Types of Compression – lossless and lossy, intra-frame and inter-frame,	
	5.3 Types of Redundancies – statistical, psycho-visual	
	5.4 CODEC	
	5.5 Lossless / Statistical Compression Techniques – entropy, RLE, Huffman,	

	arithmetic coding, LZ, LZW DPCM coding	
5.6	Lossy / Perceptual Compression Techniques – Transform, psycho-analysis, inter-frame correlation,	
5.7	JPEG image Coding Standard	
6.	Multimedia Architecture	3
6.1	User Interfaces – GUI, widget toolkit, GTK+, X windows system, motif.	
6.2	Streaming Technology – overview, advance system format (ASF), web radio, quality of service (QOS).	
7.	Multimedia Application Development	18
7.1	Multimedia Software Life Cycle – feasibility study, requirement analysis, project planning and management, designing, implementation, integration, delivery and maintenance.	
7.2	Conceptualization - subject matter/theme, target audience, objectives	
7.3	Content Collection and Processing	
7.4	Story	
7.5	Flow-line	
7.6	Script – general guidelines, guidelines for text based information, guidelines for audio information, guidelines for interactivity, guidelines for learner control, guidelines for feedback	
7.7	Storyboard – guidelines for: text, visual element, motion video, animation, audio	
7.8	Hardware and software for implementation.	
7.9	Authoring Metaphors – slide show, book, windowing, timeline, network, icon metaphor.	

Practical

Total Periods : 60

Periods : 4 P/W

1. Sound Forge

Sound recording and editing through sound forge XP

- 1.1 The main screen
- 1.2 The data window
- 1.3 Opening an existing file - playing a sound file
- 1.4 Playing a section of a file
- 1.5 Copying data to a new file
- 1.6 Saving a file
- 1.7 Simple editing
- 1.8 Advanced editing
- 1.9 Editing sound formats
 - 1.10 Applying sound processing functions
 - 1.11 Recording sound using sound forge.

2. Adobe Premiere

- 2.1 Creating desktop video with Adobe Premiere
- 2.2 Creating on Adobe Premiere movie

- 2.3 Starting a new project importing clips, assembling the clipping construction window, previewing the movie, changing duration of a cell, creating a transition, adding other clips and transitions.
- 2.4 Applying filters to a clip
- 2.5 Changing the time unit in the construction window
- 2.6 Using preview command to preview the transition and filter effects
- 2.7 Adding sound to movie
- 2.8 Connecting and capturing source video through broadway cord
- 2.9 Editing and compressing the video
- 3. **Adobe Photoshop**
 - 3.1 Scanning image
 - 3.2 Creating new images
 - 3.3 Changing foreground and background colours
 - 3.4 Creating and using paths
 - 3.5 Editing and retouching
 - 3.6 Duplicating images
 - 3.7 Layers - linking with layers
 - 3.8 Grouping a images
 - 3.9 Rubber stamp and pattern stamp tool
 - 3.10 Painting - paintbrush tool, air-brush tool, pencil tool, eraser tool, gradient tools
 - 3.11 Photoshop filters
- 4. **Author ware**
 - 4.1 Introduction - system requirements, installing, general features
 - 4.2 Knowledge objects - introduction to knowledge objects, choosing a knowledge object, adding a knowledge object file, authorware knowledge objects
 - 4.3 Authoring basics - icon based authoring what each icon does the toolbar, working with icons on the flow line, authoring - step by step, distribution requirements, packaging an AW piece, packaging an AW piece for the web
 - 4.4 Creating interactions - components of an interaction, How an interaction works, tracing the flow through an interaction, setting up an interaction step by step
 - 4.5 Directing the flow - Decision structure, frameworks, navigation structures -step by step
 - 4.6 Transitions, Positioning and motion - using transition for special effects, positioning objects using the motion icon, making objects move step by step.
- 5. **Director**
 - 5.1 Introduction - system requirement, installing director
 - 5.2 Basic - Overview, work area, adding interactivity with lingo, using the score, using markers, selecting and editing frames in the scores using xtras
 - 5.3 Sprites - creating, selecting and layering sprites positioning, splitting and joining sprites
 - 5.3 Working with cast members and casts - using the cast window, creating cast members
 - 5.4 Behaviours - attaching behaviour, creating and modifying behaviour
 - 5.5 Colour, Tempo and transitions - animation, navigation and user interaction, movies in a window, sound, video and synchronization, distributing movies.
- 6. **Tool book Instructor**
 - 6.1 Introduction - system requirement, installing instructor

- 6.2 Understanding Instructor concepts - planning the project, building an application, using open script
- 6.3 Exploring the Instructor interface - about the Instructor, Visual interface using tools in Instructor
- 6.4 Using the book specialist - working with books and pages, working with Toolbook II catalogues, working with objects, setting object properties, adding buttons, working with text & hotwords, working with list boxes and combo boxes, adding graphics, using multimedia, hiding, showing and animating objects, creating a quiz using question objects.

REFERENCE BOOKS

- 1. Multimedia Communication – by Keno et al – PH
- 2. Principles of Multimedia – by Ranjan Parekh, Mc Grew Hill.
- 3. Fundamentals of Computer Graphics & Multimedia – by Mukherjee – PHI
- 4. Multimedia – An Introduction – by John Villamil & Louis Molina – Prentice Hall
- 5. Multimedia – Production Planning & Delivery – by John Villamil & Louis Molina – Prentice Hall
- 6. Multimedia – Sound & Video – by Jose Lozano – Prentice Hall
- 7. Multimedia Graphics – by John Villamil & Leony Fernandez, Elias – Prentice Hall
- 8. Manuals for Sound Forge, Adobe Premiere, Adobe Photoshop, Authorware Attain, Director, Toolbook Instructor

LIST OF EQUIPMENT

Hardware : Multimedia PC
(for detail, please refer Annex – I)

Software : Adobe Master Collection

LINUX OPERATING SYSTEM

L *T* *P*
3 1 4

Curri. Ref. No.: IT 410

Total Contact hrs: 120

Total marks: 175

Theory: 100

Theory: 45

End Term Exam: 75

Tutorial: 15

P.A.: 25

Practical: 60

Practical: 75

Pre requisite: IT 404

End Term Exam: 25

Credit: 6

P.A : 50

Theory

Total Periods : 45

Periods : 3 P/W

UNIT	TOPIC/SUB-TOPIC	TOTAL HRS.
1.0	LINUX – OPERATING SYSTEM	4
	1.1 History and development of LINUX O.S.	
	1.2 Features, Structures of LINUX O.S.	
	1.3 Kernel, Shell, Applications Utilities.	
	1.4 Installation requirements	
	1.5 LINUX User Interface, Classes of user, Operational users, Programmers, End users	
	1.6 Types of Interface, General Command language, Command structure, Shell, Windows, Icons , slide bars, title bars	
2.0	LINUX ESSENTIALS	8
	2.1 Startup & shutdown Process Booting Procedure with different stages, Login process, Password concept, who, who am i , tty, date and cal commands, System shutdown	
	2.2 File concept - File types in LINUX, Hierarchical directory structure, File system structure, File creating, displaying, concatenating and copying	
	2.3 Creating and changing directories, removing files and directories-Cd, cp, md, rm, mkdir, rmdir, cat	
	2.4 File attributes and permissions Setting permissions, Changing permissions, Changing group & group ownership of a file chmod, chown, chgrp, Various users and access rights	
	2.5 File processing commands wc, head, tail, cut, paste join, split, sort, grep, egrep, tr, comm, cmp, diff, more, less commands	
	2.6 File formatting and printing commands pr with all options, lp commands	
3	LINUX PROCESSES AND OTHER UTILITIES	9

3.1	On line help facilities in LINUX Man and help command	
3.2	Mathematical commands bc, expr, factor, units	
3.3	Linking files and directories Removing files and directories	
3.4	Inter-process communication Pipes ,filters, and tee command	
3.4	Other process facilities Background processing, Listing all active and background processes, ps command with all options, Terminating processes, Kill command, Process scheduling, Nice command, Wait command, Sleep command	
3.5	Communication commands user to user communication using write, Mailing using mail, Broadcasting messages using wall	
4	VI AND OTHER EDITORS	8
4.1	vi editor Features of vi editor, modes of vi, creating, editing & saving text, cursor movement commands, text scrolling commands text deletion commands, find and replace, copying and yanking text, cut and paste in vi , set commands, abbreviations and map commands, saving files & quitting vi	
4.2	Introduction to joe and vim editors	
5	SHELL PROGRAMMING	8
5.1	Various LINUX shells bash, csh, ksh	
5.2	Shell scripts writing and executing, Parameter substitution, Shell variables, Standard shell variables User define variables Command substitution, Expressions, arithmetic operators, logical, Operators, test expressions, read statement, test command, control structures – for, while and until statements, if structure, nested if structure, if.. then.. elif statement, case structure	
6	INSTALLATION AND SYSTEM ADMINISTRATION	8
6.1	Installation Requirement & Linux file system Boot block, super block, inode table, data blocks, Partitioning the hard disk for LINUX, Inastalling the LINUX system	
6.2	System administration Common administrative tasks, Role of system administrator Managing user accounts – adding and deleting users, changing permissions and ownerships Creating and managing groups	

	Creating and mounting files system
	Backup and restoring files
	Linuxconf utility
6.3	X-configuration , changing X settings
6.4	KDE and Gnome graphical interfaces

Practical

Total Periods : 60

Periods :4 P/W

- **List of Practical**

- Practice on tty command
 - Study of password command
 - Study of who, who am i, tty,date and cal commands
 - Executing commands in background
 - Study of ps , kill commands
 - Listing the files in a directory using all options to ls.
 - Creating sub-directories.
 - Changing the mode of a file/directory.
 - Changing the owner of a file/directory.
 - Study of file processing commands
 - Commands using pipes and I/O redirectors
 - Display date using various formats
- User to user communication using communication commands.
 - Study of vi editor
 - Modes of vi
 - Creating and saving files using vi
 - Cursor movement commands
 - Cut and paste commands
 - Find and replace commands
 - Ex mode commands

- **Write a shell script for the following**

- The shell script should check whether every argument supplied is a file or a directory and list it accordingly.
- The shell script should check every argument and carry out the following
 - if the argument is a directory, then display the number of files or directories present in that directory.
 - If the argument is a file, then display the size of the file
 - If the argument does not exist, then create the directory.
- The shell script should accept the username as argument and find out at how many terminals has this user logged on.
- The shell script must display a list of all files in the current directory to which you have read, write and execute permissions.
- The shell script should delete all lines containing the word “UNIX ‘ in the files supplied as arguments to this shell script.
- Demonstration of Installation of LINUX OS
- Mounting of filesystem – using floppy and CDROM
- Configuring X-environment
- Switching between KDE and Gnome
- Adding Group and Users logins

REFERENCE BOOKS

Sl. No.	Title	Edition, Year of Publication	Author, Publisher & Address
1.	Red hat Linux unleashed	Latest	Techmedia (BPB publication)
2.	UNIX concept and Applications	Latest	Sumitabha Das -Tata McGraw Hill Publication, N.Delhi
3.	Redhat LINUX 7.x Bible	Latest	Cristopher negus, IDG books India
4.	Using LINUX	Latest	Jack Tackett, David Gunter, PIII, EEE Edition
5.	Linux Installation and Administration	Latest	Nicholas Wells, Course technology, (Vikas Publishing, New Delhi)
6.	Unix Operating System	Latest	Peter Nortorn- BPP Publications

LIST OF EQUIPMENT

Hardware : Multimedia PC
(for detail, please refer Annex – I)

Software : Linux Operating System (Redhat / SuSE / Ubuntu)

PROJECT

<i>L</i>	<i>T</i>	<i>P</i>
0	0	14

Curri. Ref. No.: IT 506

Total Contact Hrs.: 210

Total marks: 200

Theory: 0

Theory: 0

End Term Exam: 0

Tutorial: 0

P.A.: 0

Practical: 210

Practical: 200

Credit: 7

End Term Exam: 100

P.A : 100

Aim: The main aim of the final year project is to develop student's knowledge for solving technical problems in order to produce competent and sound engineers.

The objectives of a final year project are to:

- Allow students to demonstrate a wide range of the skills learned during their course of study
- Allow students to develop problem solving, analysis, synthesis and evaluation skills.
- Encourage teamwork.
- Improve students' communication skills through the production of professional reports

Suggested List of activities to be done:

1. Allow the student to choose their Project
2. Collect information, Planning, Executing, and Managing the Project
3. Documenting the Project
5. Project Assessment and Marking

PROFESSIONAL PRACTICES -V

L T P
0 0 2

Curri. Ref. No.: IT 511

Total Contact hrs: 30

Total marks: 50

Theory: 0

Theory: 0

End Term Exam: 0

Tutorial: 0

P.A.: 0

Practical: 30

Practical: 50

Pre requisite: NIL

End Term Exam: 0

Credit: 1

P.A.: 50

Aim : To familiarise and expose students more extensively with the methodology of their own subject.

Objective:

On completion of this course, the Student will be able to:

- Increase their understanding of ideas as presented by the work at hand.
- Be actively involved in their own learning
- Speak more articulately
- Listen better
- Read more thoroughly
- Learn to justify/ qualify opinions
- Prepare a report on the seminar presentation topic

Suggested List of Activities:

1. Arrangement of expert talks and attending those talks
2. Each student will be assign a suitable topic related to the subjects being taught in the respective semester on which they have to self-study, prepared a small report (5-10 pages)
3. Develop (10-15 minutes) presentation (power point presentation preferably with animation) and deliver it as seminar.
4. Presentation follows by group discussion
5. Industrial visits