MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI
TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES

COURSE NAME : COMPUTER ENGINEERING GROUP

COURSE CODE : CO/CD/CM/CW/IF

DURATION OF COURSE : 6 SEMESTERS For CO/CM/CW/IF (8 SEMESTERS for CD)   WITH EFFECT FROM 2012-13

SEMESTER : THIRD   DURATION : 16 WEEKS

FULL TIME / PART TIME : FULL TIME   SCHEME : G

SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		SW (17300)
				TH	TU	PR		Max	Min	Max	Min	Max	Min	Max	Min	
1	Applied Mathematics $	AMS	17301	03	--	--	03	100	40	--	--	--	--	--	--	
2	Data Structure Using 'C'	DSU	17330	04	--	04	03	100	40	50#	20	--	--	25@	10	
3	Electrical Technology	ETE	17331	03	--	02	03	100	40	--	--	--	--	25@	10	
4	Relational Database Management System	RDM	17332	04	--	04	03	100	40	--	--	25#	10	50@	20	50
5	Digital Techniques	DTE	17333	03	--	02	03	100	40	--	--	--	--	25@	10	
6	Graphical User Interface (GUI) Programming	GUI	17026	--	--	02	--	--	--	50@	20	--	--	--	--	
7	Professional Practices-I	PPO	17027	--	--	03	--	--	--	--	--	--	--	50@	20	
			TOTAL	17	--	17	--	500	--	100	--	25	--	175	--	50

Student Contact Hours Per Week: **34 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks : **850**

@- Internal Assessment, # - External Assessment, ▭ No Theory Examination, $ - Common to all branches

Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, ,OR-Oral, TW- Term Work, SW- Sessional Work
  ➢ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subjects is to be converted out of 50 marks as sessional work (SW).
  ➢ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms.
  ➢ Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code.

Course Name : All Branches of Diploma in Engineering & Technology

Course Code : AE/CE/CH/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/

ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI

Semester   : Third

Subject Title : Applied Mathematics

Subject Code : 17301

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	--	03	100	--	--	--	100

NOTE:

➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

Applied mathematics is designed for its applications in engineering and technology. It includes the topics integration, differential equation, probability distribution. The connection between applied mathematics and its applications in real life can be understood and appreciated.

Derivatives are useful to find slope of the curve, maxima and minima of function, radius of curvature. Integral calculus helps in finding the area. In analog to digital converter and modulation system integration is important. Differential equation is used in finding curve. Probability is used in Metrology and quality control.

The fundamentals of this topic are directly useful in understanding engineering applications in various fields.

General Objectives:

 Students will be able to:

1. Apply derivatives to find   slope, maxima, minima and radius of curvature.

2. Apply integral calculus to solve different engineering problems.

3. Apply the concept of integration for finding area.

4. Apply differential equation for solving problems in different   engineering fields.

5. Apply the knowledge of   probability to solve the examples related to the production process.

Learning Structure:

Applications

Apply the principles of mathematics to solve examples in all branches of Engineering Diploma.

Procedure

Solving problems of tangent, normal. Finding maxima, minima and radius of curvature	Solving problems on methods of integration and its properties. Finding area.	Solving examples of differential equations of first order and first degree.	Solving different examples on binomial, poisson and normal distribution

Principle

Methods of finding slope, curvature, maxima and minima	Methods of finding integration, definite integration and its properties	Methods of differential equations of first order and first degree	Formulae for binomial, normal, and poisson distribution

Concept

Geometrical meaning of derivatives, increasing and decreasing functions	Integration of standard functions. Rules of integration, integration by parts, partial fractions	Order and degree of differential equation. Formation of differential equation	Probability of repeated trails of random experiments

Facts

First order and second order derivatives	Derivatives, notation of integration, definition of integration	Integration, definition of differential equation	Permutation , Combination, probability of an event

Theory:

Topic and Contents	Hours	Marks

Topic-1 Applications of Derivative
Specific objectives :
➢ Find slope, curvature, maximum and minimum value of functions related to different engineering applications.
    • Examples for finding slope , equations of tangent and normal to the curve
    • Maxima and minima.
    • Radius of curvature.
	06	16

Topic-2 Integral Calculus		

2.1 Integration   ------------------------   20
Specific objectives :
➢ Integrate function using different method.
    • Definition of integration as anti derivative, rules of integration.
    • Integration of standard functions
    • Methods of integration
        Integration by substitution.
        Integration by partial fractions.
        Integration by parts and generalized rule by parts.
	14	44

2.2 Definite Integrals   ---------------------------------- 16
Specific objectives :
➢ Solve problems on definite integrals using the properties.
    • Definite integral- Definition, examples.
    • Properties of definite integrals without proof and simple examples.
	08	

2.3 Application of Definite Integrals   -----------------------08
 Specific objectives :
➢ Find   area.
    1.   Area under a curve.
    2.   Area between two curves.
	04	

Topic 3 - Differential Equation.		

3.1 Differential equation
Specific objectives :
➢ Solve the differential equation of first order and first degree
➢ Solve different engineering problems using differential equation
    • Differential equation- Definition, order and degree of a differential equation. Formation of differential equation containing single constant.
    • Solution of differential equation of first order and first degree for following types
        Variable separable form,
        Equation reducible to variable separable form.
        Linear differential equation.
        Homogeneous differential equation.
        Exact differential equation.
	10	20

Topic 4 - Probability		

4.1 Probability **Specific objectives :**   **---------------------------- 08**
 ➢ Solve different engineering problems related to probability process.
    • Definition of random experiment, sample space, event, occurrence of event and types of event (impossible, mutually exclusive, exhaustive, equally likely)
    • Definition of probability, addition and multiplication theorems of probability.
	02	20

4.2 Probability Distribution   **---------------------- 12**
    • Binomial distribution
    • Poisson's Distribution
    • Normal distribution
	04	

Total	**48**	**100**

Learning Resources:
  1) **Books:**

Sr. No	Title	Authors	Publication
1	Mathematic for Polytechnic	S. P. Deshpande	Pune Vidyarthi Girha Prakashan' Pune
2	Calculus : Single Variable	Robert. T. Smith	Tata McGraw Hill
3	Higher Engineering mathematics	B. V Ramana	Tata McGraw Hill
4	Higher Engineering mathematics	H. K. Dass	S .Chand Publication
5	Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Delhi
6	Applied Mathematics	P. N. Wartikar	Pune Vidyarthi Griha Prakashan, pune

  2) **Websites :**

    i) www.khan academy

Course Name   : **Computer Engineering Group**

Course Code   : **CO/CM/IF/CD/CW**

Semester   : **Third**

Subject Title   : **Data Structure Using 'C'**

Subject Code   : **17330**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	--	04	03	100	50#	--	25@	175

NOTE:

➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**
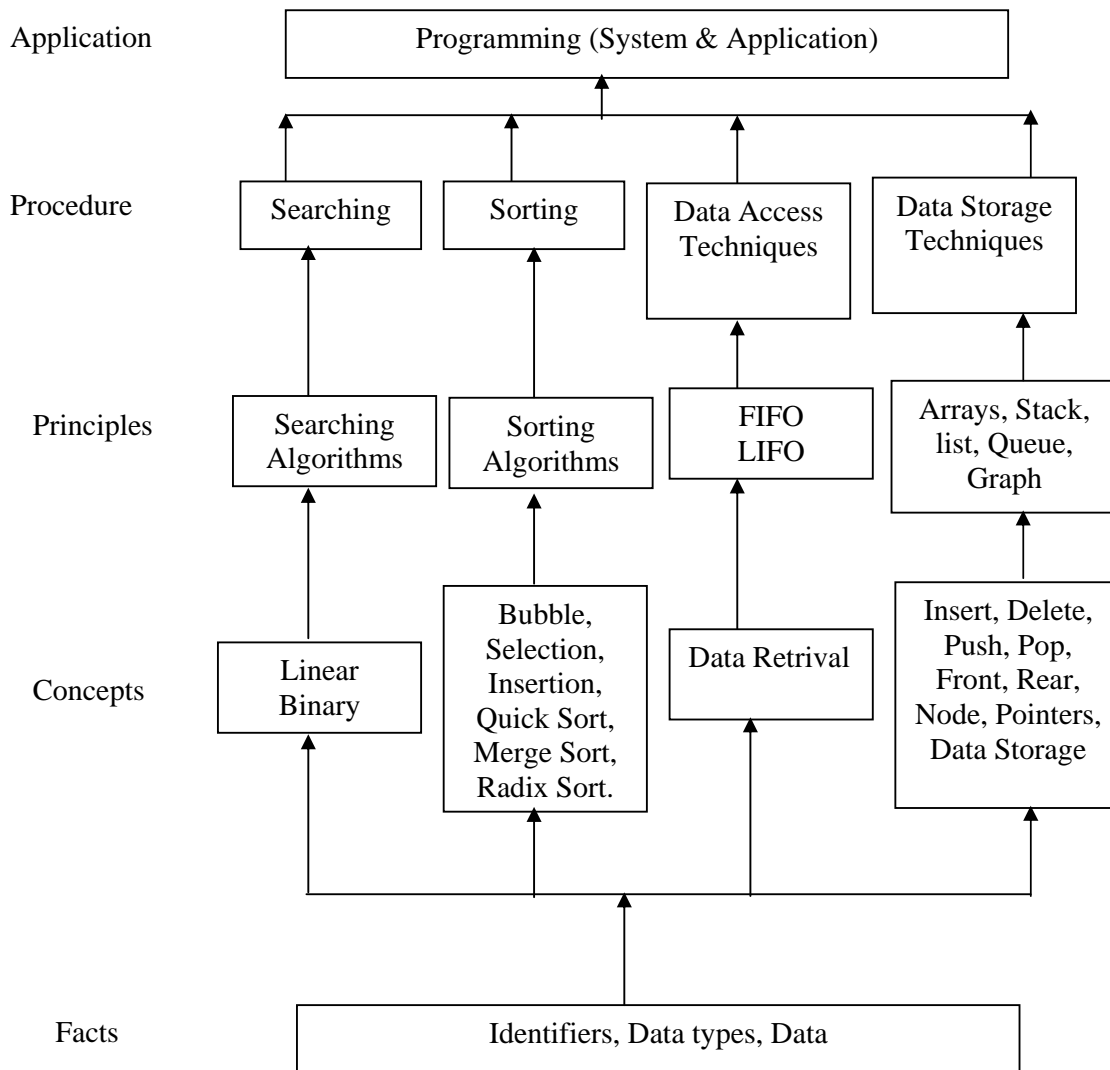
Rationale:

Data structure is a subject of primary importance to the discipline of Computer Science & Engineering. Data structure is a logical & mathematical model of storing & organizing data in a particular way in a computer. After learning this subject student will be able to identify the problem, analyze different algorithms to solve the problem & choose most appropriate data structure to represent the data.

General Objectives:

The student will be able to:

- Know the fundamentals of data structure
- Classify data structures.
- Select the appropriate data structure.
- Apply the different searching and sorting techniques.
- Apply different algorithms to solve the real world problem.

Learning Structure:

Application	Programming (System & Application)
Procedure	Searching / Sorting / Data Access Techniques / Data Storage Techniques
Principles	Searching Algorithms / Sorting Algorithms / FIFO LIFO / Arrays, Stack, list, Queue, Graph
Concepts	Linear Binary / Bubble, Selection, Insertion, Quick Sort, Merge Sort, Radix Sort. / Data Retrival / Insert, Delete, Push, Pop, Front, Rear, Node, Pointers, Data Storage
Facts	Identifiers, Data types, Data

Contents: Theory

Topic	Content	Hours	Marks

1	**Introduction to Data Structure**
	Specific Objective:
	➢ To understand data structure organization & classification
	➢ To understand operations on data structure.
	➢ To understand approaches to design an algorithm.
	➢ Knowing the complexity of an algorithm
	1.1 Basic Terminology
	   • Elementary data structure organization
	   • Classification of data structure
	1.2 Operations on data structures
	   • Traversing, Inserting, deleting
	   • Searching, sorting, merging
	1.3 Different Approaches to designing an algorithm
	   • Top-Down approach
	   • Bottom-up approach
	1.4 Complexity
	   • Time complexity
	   • Space complexity
	1.5 Big 'O' Notation
		06	08

2	**Sorting and Searching**
	Specific Objective:
	➢ To understand and apply sorting algorithms on data.
	➢ To understand and apply searching algorithms on data.
	2.1 Sorting Techniques
	   • Introduction
	   • Selection sort
	   • Insertion sort
	   • Bubble sort
	   • Merge sort
	   • Radix sort (Only algorithm)
	   • Shell sort (Only algorithm)
	   • Quick sort (Only algorithm)
	2.2 Searching
	   • Linear search
	   • Binary search
		10	16

3	**Stacks**
	Specific Objective:
	➢ To understand and apply the knowledge of the data structure – 'stack' in the application programs.
	3.1 Introduction to stack
	   • Stack as an abstract data type
	   • Representation of stack through arrays
	3.2 Applications of Stack
	   • Reversing a list
	   • Polish notations
	   • Conversion of infix to postfix expression
	   • Evaluation of postfix expression
		12	18

	• Converting an infix into prefix expression • Evaluation of prefix expression • Recursion		
4	**Queues** Specific Objective: ➢ To understand and apply the knowledge of the data structure – 'Queue' in the application programs. 4.1 Introduction • Queues as an abstract data type • Representation of a Queue as an array 4.2 Types of Queue • Circular Queue • Double Ended Queue • Priority Queue • Dequeues 4.3 Applications of Queue	08	12
5	**Linked List** Specific Objective: ➢ To understand and apply the knowledge of the data structure – 'Linked List' in the application programs. 5.1 Introduction • Terminologies: node, Address, Pointer, Information, Next, Null Pointer, Empty list etc. 5.2 Type of lists • Linear list • Circular list • Doubly list 5.3 Operations on a singly linked list (only algorithm) • Traversing a singly linked list • Searching a linked list • Inserting a new node in a linked list • Deleting a node from a linked list	08	12
6	**Trees** Specific Objective: ➢ To understand and apply the knowledge of the data structure – 'Trees' on data. 6.1 Introduction • Terminologies: tree ,degree of a node, degree of a tree, level of a node, leaf node, Depth / Height of a tree, In-degree & out-Degree, Directed edge, Path, Ancestor & descendant nodes. 6.2 Type of Trees • General tree • Binary tree • Binary search tree (BST). 6.3 Binary tree traversal (only algorithm) • In order traversal • Preorder traversal • Post order traversal 6.4 Expression tree	12	18

7	**Graph and Hashing**
	Specific Objective:
	  ➤ To understand and apply the knowledge of 'graph' and 'hashing' function on data.
	7.1 Introduction
	  • Terminologies: graph, node (Vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, weight, path, length.
	7.2 Representations of a graph
	  • Array Representation
	  • Linked list Representation
	7.3 Traversal of graphs
	  • Depth-first search (DFS).
	  • Breadth-first search (BFS).
	7.4 Applications of Graph
	7.5 Hashing
	  • Hash function
	  • Collision resolution techniques
		08	16

	Total	**64**	**100**

Practical:
Skills to be developed:

Intellectual Skills:

1. Classify data structures.
2. Select the appropriate data structure.
3. Apply the different searching and sorting techniques.
4. Apply different algorithms to solve the real world problem.

Motor Skills:

1. Operate the computer system

List of Practical:

1. Perform insertion & deletion operation on one dimensional array.

2. Implement the searching of the given number in one dimensional array using linear search and binary search methods.

3. Write a program to sort the given list represented using array in ascending order by sorting techniques like bubble sort, insertion sort and selection sort.

4. Understand the concept of stack and implement PUSH and POP operations on stack using array.

5. Understand the concept of Queue and implement insertion and deletion operation on Queue using array.

6. Understand the concept of Link list and implement operations on Singly Link list.

7. Understand how to create a Binary Tree.

8. Understand and create a graph of n vertices using an adjacency list.

9. Understand the concept of Hashing and write a program to search an element using Hashing techniques

10. Seminar on mini study project.

Learning Resources:
1   Books:

Sr. No.	Author	Title	Publisher
1	ISRD Group New Delhi	Data structure Using C	Tata McGraw Hill
2	Reema Thareja	Data Structure Using C	OXFORD University Press
3	Ashok Kamthane	Introduction to data structures in C	Pearson
4	Prof. P.S. Deshpande, Prof D.G. kakde	C & data structures	Dreamtech press
5	Amitava Nag & Jyoti Prakash Singh	Data structures & Algorithms Using C	Vikas

2   Websites:

http://www.oupinheonline.com/book/thareja-data-structures-using-c/9780198065449

www.vikaspublishing.com/teachersmannual.aspx

www.pearsoned.co.in/prc

www.phindia.com/learningresources.aspx

3. Mini Project:

Use any resources for mini projects in Data Structure.

Course Name   : **Computer Engineering Group**

Course Code   : **CO/CM/IF/CD/CW**

Semester   : **Third**

Subject Title   : **Electrical Technology**

Subject Code   : **17331**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

NOTE:

➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**

➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**
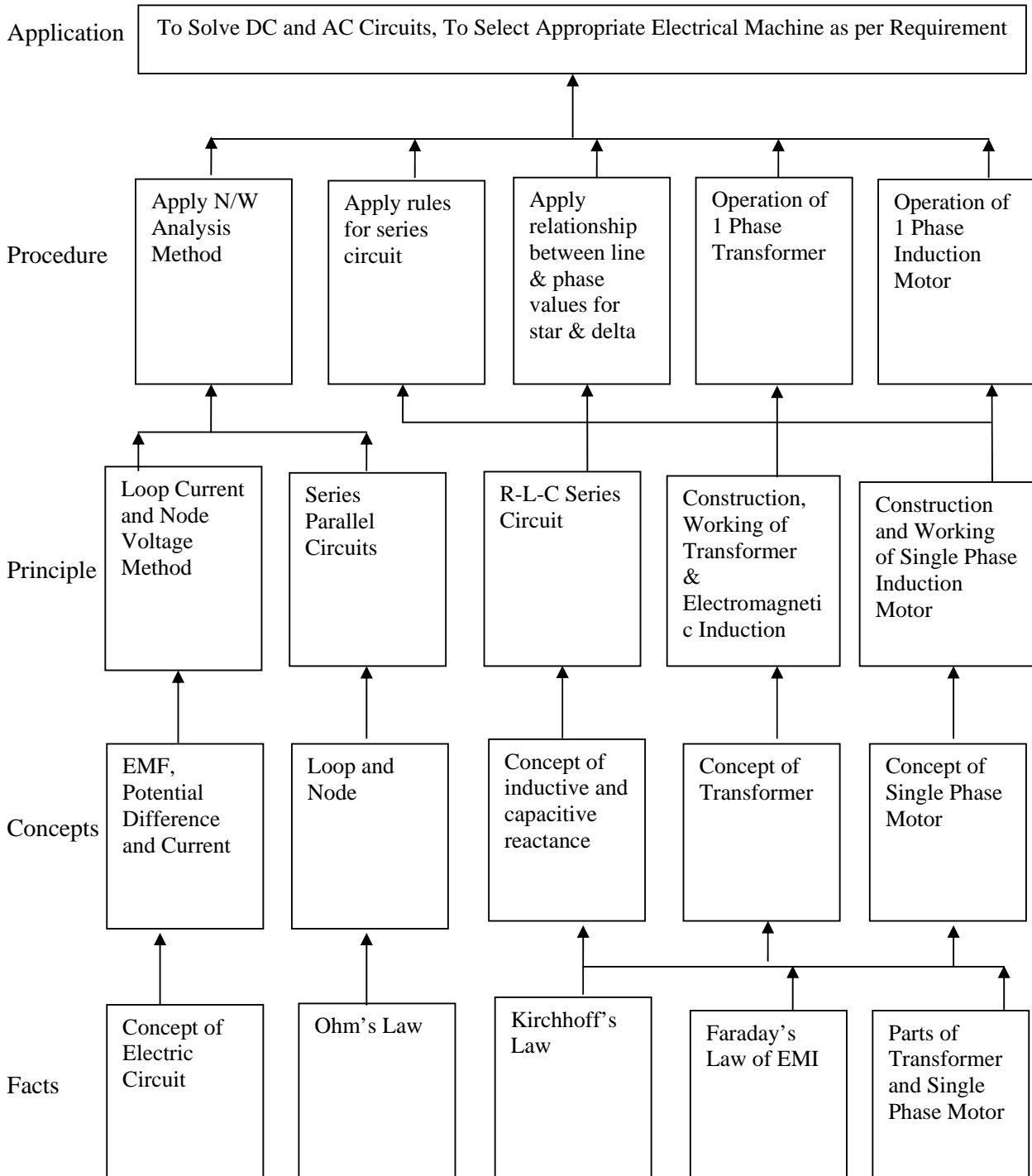
Rationale:

This subject is an allied subject for diploma in computer engineering, computer technology and information technology course. As the present industry job profile requires multi engineering knowledge, this subject gives the basic knowledge of electrical engineering. The technicians & supervisors from all branches of engineering have to deal with various types of electrical gadgets & equipments. Electrical engineering involves the conception, design, development, & production of the electrical or electronic products & systems needed by our technological society. Hence, it is important to study electric circuits, different electrical machines, their principles and working characteristics. This subject covers analysis of ac and dc networks, working principles of commonly used ac motors. The basic concepts studied in this subject will be very useful for understanding of other higher level subjects in further study.

General Objectives:

The student will be able to:

• Know the concepts of D.C. Circuits.

• Understand concept of A.C. Circuits.

• Know the importance of 3 phase circuits.

• Know construction and working of different electrical machines.

Learning Structure:

Application | To Solve DC and AC Circuits, To Select Appropriate Electrical Machine as per Requirement

Procedure:
- Apply N/W Analysis Method
- Apply rules for series circuit
- Apply relationship between line & phase values for star & delta
- Operation of 1 Phase Transformer
- Operation of 1 Phase Induction Motor

Principle:
- Loop Current and Node Voltage Method
- Series Parallel Circuits
- R-L-C Series Circuit
- Construction, Working of Transformer & Electromagnetic Induction
- Construction and Working of Single Phase Induction Motor

Concepts:
- EMF, Potential Difference and Current
- Loop and Node
- Concept of inductive and capacitive reactance
- Concept of Transformer
- Concept of Single Phase Motor

Facts:
- Concept of Electric Circuit
- Ohm's Law
- Kirchhoff's Law
- Faraday's Law of EMI
- Parts of Transformer and Single Phase Motor

Theory:

Topic and Contents	Hours	Marks

Topic 1: D.C. Circuits
Specific Objectives
  ➢ Understand practical use of KCL and KVL
  ➢ Represent complicated network by single equivalent resistance
Contents:
1.1 Concept of Emf , Potential Difference, D.C. Current & D.C.Voltage (Symbols and Units)
1.2 Basic Laws and their application:
  • Ohm's Law
  • Kirchhoff's Current & Voltage Law
  • Mesh Loop Current Method (Two loops only)
  • Node Voltage Method (Two nodes only)
1.3 Simplification of Networks
  • Series & Parallel Circuits
  • Star-Delta & Delta-Star Conversion
  • (Simple Numerical on 1.2 and 1.3)
	08	12

Topic 2: A.C. Fundamentals
Specific Objectives
  ➢ Understand nature of sine waveform & calculate its parameters
  ➢ Identify inductive and capacitive load
Contents:
2.1 Basics of Electromagnetism
  • Concept of magnetic Flux
  • Concept of Reluctance
  • Faraday's Law of Electromagnetic Induction
  • Lenz's law
  • Statically &Dynamically Induced EMF.
  • Concept of Inductance, Capacitance, Inductive &Capacitive Reactance
2.2 Sinusoidal Representation With Equation of Alternating V & I (08)
  • Concept of Angular Velocity, Frequency, Cycle & Time Period
  • Concept of Peak Value, Average Value & RMS Value
  • Concept of Form &Peak Factor
2.3 Phase of AC Quantities (Definition & phasor representation)
  • Phase and Phase Difference
  • In-Phase Quantity
  • Lagging Quantity
  • Leading Quantity
2.4 Behavior of AC Circuits (Waveforms, Equations & Phasor Diagrams)
  • AC Circuits Containing Resistance Only
  • AC Circuits Containing Inductance Only
  • AC Circuits Containing Capacitance Only
  • (Simple Numerical on 2.2 & 2.4)
	10	26

Topic 3: AC Series Circuit
  Specific Objectives
   ➤ Understand concept of impedance
   ➤ Distinguish between active, reactive and apparent power
     Contents:
3.1 Concept of Impedance and Impedance Triangle
3.2 Concept of Power Factor and Its Significance
3.3 Phasor Diagram, Voltage and Current Equation
   • RL Series Circuit
   • RC Series Circuit
   • RLC Series Circuit and series resonance
3.4 Active, Reactive and Apparent power, Power Triangle
3.5 Measurement of single phase power using Dynamometer Type wattmeter
     (Simple Numerical on 3.3 and 3.4)
	10	20

Topic 4: Three Phase Circuits
  Specific Objectives
   ➤ Distinguish between 1 phase and 3 phase a.c. nature
   ➤ Develop balanced load.
     Contents:
4.1 Advantages of Three Phase Circuits over single phase circuits
4.2 Concept of Three Phase Supply, Its Waveforms Representations
     & Phase Sequence, Concept of Balanced Load.
4.3 Star Connected Balanced System
   • Relation Between Phase and line Current
   • Relation Between Phase and line Voltage
   • Equation for Three Phase Power
   • Phasor Diagram
4.4 Delta Connected Balanced System
   • Relation Between Phase and Line Current
   • Relation Between Phase and line Voltage
   • Equation for Three Phase Power
   • Phasor Diagram (Simple Numerical on 4.3 & 4.4)
	06	14

Topic 5: Electrical Machines
Specific Objectives
   ➤ Able to select motor depending on application
   ➤ Able to specify transformer w.r.t. specifications.
     Contents:
5.1 Single Phase Induction Motor : Principle of Working, Operation and
   Application of
   • Resistance Split Phase Motors
   • Capacitor Start Motors
   • Shaded Pole Motors
   • Universal Motors
5.2 Transformer Construction
   • Construction and Working Principle
   • Classification of Transformers
5.3 Transformer Operation
   • Emf Equation (No Derivation)
   • Voltage and Current Ratio
   • Efficiency and Voltage Regulation
5.4 Auto Transformer
   • Construction and Working
   • Comparison With Two Winding Transformer
	10	20

Topic 6: Electrical Safety	04	08

Specific Objectives
   ➢ Aware about earthing need
   ➢ Able to identify cause of problem
     Contents:
6.1 Earthing of Electrical Equipment
     • Pipe earthing
     • Plate earthing
6.2 Fuses
     • Classification of Fuses and basic terms related with it
     • Miniature Circuit Breaker
     • Comparison between fuse and MCB
6.3 Electric shock and its effects
     • Factors Affecting Lethality of Electric shock
     • Precautions Against Electric Shock
     • Handling Shock Victims			

Total		**48**	**100**

Intellectual Skills:

1. Identify and select suitable electrical instruments for measurement
2. Identify and give specifications of electrical motors and transformers
3. Distinguish between 1 phase and 3 phase nature.
4. Identify safety equipments required.
5. Decide the procedure for setting experiments.

Motor Skills:

1. Draw wiring diagram
2. Make wiring connections to connect electrical equipments and instruments.
3. Measure electrical power and other electrical quantities.
4. Use of safety devices while working.

List of Practical:

1. Know your electrical laboratory.
2. Verify Kirchhoff's law.
3. Verify star delta & delta star conversion.
4. Observe sine wave of 1 KHz, 2V on CRO and determine its time period, RMS, average value.
5. Determine the resistance, inductance and impedance of choke coil by observing its response to A.C. and D.C. supply.
6. Draw the phasor diagram and determine the power factor of R-L-C series circuit
7. Verify the relationship between line and phase values of voltages and currents in three phase balanced star and delta connected load.
8. Identify the type of transformer based on the transformation ratio of single phase transformer.
9. Determine efficiency and single phase transformer at no load, half load and full load by conducting load test.
10. Prepare wiring for one lamp control using two switches.

Note: All the above experiments are compulsory.

List of Assignments:

    1. Four Mathematical Assignments, each of minimum 25 problems on topics 1 to 4.

    2. Six Assignment based on theory questions, each of minimum 20 questions from all topics.

Learning Resources:
   1. Books:

Sr. No.	Author	Title	Publisher
1	R.S.Ananda Murthy	Basic Electrical Engineering	PEARSON
2	S.N. Singh	Basic Electrical Engineering	PHI Learning
3.	D.C.Kulshreshtha	Basic Electrical Engineering	Mc Graw Hill
4.	B.L.Theraja	Electrical Technology Vol – I and II	S.Chand and Co.

   2. Websites:

- www.wikipedia.org
- http://xiendianqi.en.made-in-china.com/
- http://ewh.ieee.org/soc/es/
- http://ecmweb.com/mag/electric_minimizing_ac_induction/
- http://www.electrical-technologies.com/

   3. List of Equipments:

    1. D. C. Power Supply

    2. Different kits as per practical list

    3. CRO

    5. Signal Generator

    4. 1 phase Transformer

    5. Analog/Digital Multimeters

    6. Connector, banana pins, crocodile pins

Course Name   **: Computer Engineering Group**

Course Code   **: CO/CM/IF/CD/CW**

Semester   **: Third**

Subject Title   **: Relational Database Management System**

Subject Code   **: 17332**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	--	04	03	100	--	25#	50@	175

NOTE:

> ➤ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
> ➤ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

Each and every Organization like shopping mall, hospital, banking, institutes, Industry etc. needs to share huge amount of data in effective manner. This subject enables to create, store, modify and extract information from a database.

Relational database management system has been developed to manage the information stored in the database. After learning this subject student will be able to use RDBM package as a backend for developing database applications.

General Objectives:

The Students will be able to:

1. Design the database structure with appropriate data tables.

2. Aware of proper specifications of data.

3. Create normalized database file.

3. Understand Query Processing.

Learning Structure:

Application

> RDBMS can be used as a backend for developing various database Applications using VB, VB.NET, C++, JAVA etc.

Procedure

Use relational Algebra, relational Calculus for data Processing.	Create Database using Data definition and data manipulation	Structured Query Language and PL / SQL.	Query Processing, and Security

Principles

> Integrity Constraints, Functional Dependencies, Normalization using various normal Forms.

Concepts

Data Dictionary, Database software, and Data Abstraction. Data Independence	E-R Model, EER model, Keys, Specialization and Generalization Relational Model

Facts

> Data, data types, Attributes, Domains, Operators, Records, Files

Theory:

Topic No.	Contents	Hours	Marks

01	**Database System Concept**
	Specific Objectives:
	    ➢ State the importance of DBMS effectiveness and database tools.
	    ➢ State the advantages of using database system to store operational data.
	    ➢ Explain the concept of RDBMS
	    ➢ Describe the overall structure of DBMS & Architecture of Client/Server system.
	    ➢ Explain the concept of data mining and data warehousing
	1.1 An Introduction to database.
	    Data, database, DBMS, Disadvantages of file processing system, advantages of DBMS over file processing system , Application of database.
	1.2 What is RDBMS, Difference between DBMS and RDBMS
	1.3 Names of various DBMS and RDBMS softwares
	1.4 Data abstraction, Database languages, Instance and schema, Data independence - Logical and Physical Independence.
	1.5 Components of DBMS and overall Structure of DBMS. Database Users, functions of Database Administrator.
	1.6 Introduction to client server architecture. Two/Three tier Architecture.
	1.7 The 12 Rules (Codd's laws) for fully functional RDBMS.
	1.8 Introduction to Distributed database, Introduction to data mining & data warehousing
		08	16

02	**Relational Data Model and Security and Integrity Specification**
	Specific Objectives:
	➢ Explain the commercial data processing applications by using various data models.
	➢ Implement the Concept of E-R Model.
	➢ Describe the process of Normalization & Design database structure using various Normal forms to reduce redundancy.
	➢ Explain the various data constraints.
	➢ Explain the need of data security.
	2.1 Data Model
	      • Network Model
	      • Hierarchical Model
	      • Relational Model
	2.2 Relational Model: - Basic Concepts Attributes and Domains.
	    Key Concepts:- Candidate key, Primary key, Foreign key and Super key.
	2.3 E-R model, Components of ER Model, Types of attributes, role indicator, weak & strong entity set.
	2.4 Enhanced ER Model: Introduction, Specialization & Generalization
	2.5 Relational Algebra and Relational Calculus.
	2.6 Database Design: Relational database Design, Functional dependencies, Normalization based on functional dependencies, Normal forms: 1NF, 2NF, 3NF, BCNF.
	    Normalization based on multivalued dependencies,
	    Normalization based on Join dependencies.
	2.7 Integrity Constraints**:** Domain Integrity Constraints, Entity integrity Constraints, Referential Integrity Constraints & on delete cascade
	2.8 Database Security: introduction, Data security requirements.
		14	22

03	**Interactive SQL**
	Specific Objectives:
	    ➢ Design SQL queries to Create Relational database and apply data constraints.
	    ➢ Design the queries for data manipulation.
	    ➢ Implement the queries using various operators & functions
	    ➢ Design the queries for controlling in Database.
	    ➢ Explain the concept of transaction processing.
	3.1 Introduction to SQL
	3.2 Data Types in SQL
	3.3 DDL Commands: CREATE, ALTER, DROP, TRUNCATE, DESC, RENAME, Truncate, Creating a User, Use of data constraints
	3.4 DML Commands: INSERT, UPDATE,DELETE,CALL
	3.5 SQL Operators: Arithmetic Operators, Comparison Operators, Logical Operators, Set Operators, Range Searching operators-Between, Pattern matching operators-Like.
	3.6 Oracle Functions: String, Arithmetic, Date and time, Aggregate Functions and Miscellaneous Functions. Conversion Functions, Special Date formats using To_char() function
	3.7 Queries using Group by, having, and Order by clause, Joins, Types of Joins, Sub queries.
	3.8 DCL Commands: COMMIT, SAVEPOINT, ROLLBACK, GRANT, REVOKE.
	3.9 DQL Commands: SELECT.
	3.10 Transaction Processing: The concept of Transaction, ACID properties, States of Transaction, Concurrent execution of Multiple transaction, **Serializability.**
		18	26

04	**Advance SQL: SQL Performance Tuning** Specific Objectives: ➢ Design SQL queries for implementation of VIEWS, SEQUENES, INDEXES, SNAPSHOT and SYNONYM. **4.1 Views:** What are Views? The Create View Command, Updating Views, Views and Joins, Views and Sub queries, What Views cannot do? , Dropping Views. 4.2 **Sequences**: Creating Sequences, Altering Sequences, Dropping Sequences. 4.3 **Indexe**s: Index Types, Creating of an Index: Simple Unique, and Composite Index, Dropping Indexes. 4.4 **Snapshots:** Creating a Snapshot, Altering Snapshot, Dropping a Snapshot. 4.5 **Synonyms:** Creating a Synonyms, Dropping a Synonyms.	08	12

05	**PL/SQL , Database Objects & Security**
	Specific Objectives:
	    ➢ State the features and components of the PL/SQL.
	    ➢ Write simple PL/SQL Code using control structure and handle various exceptions.
	    ➢ Create stored procedures and implement functions & create database trigger using PL/SQL.
	    ➢ Provide security to database using Locks in PL./SQL
	5.1 Introduction of PL/SQL, Advantages of PL/SQL ,The PL/SQL Block Structure, PL/SQL execution environment, PL/SQL data Types,Variables,Constants
	5.2 **Control Structure:** Conditional Control, Iterative Control, Sequential Control.
	5.2 **Exception handling:** Predefined Exception, User defined Exception.
	5.3 **Cursors:** Implicit and Explicit Cursors, Declaring, Opening and Closing a Cursor, Fetching a Record from Cursor, Cursor for loops, Parameterized Cursors.
	5.4 **Procedures:** Advantages, Creating, Executing and Deleting a Stored Procedure.
	5.5 **Functions:** Advantages, Creating, Executing and Deleting a Function.
	5.6 **Database Triggers:** Use of Database Triggers, How to apply database Triggers, Types of Triggers, Syntax for Creating Trigger, Deleting Trigger.
	5.7 **PL/SQL security-**Locks, Types of Locks-shared & exclusive. Locking strategy-Implicit &Explicit
		16	24

	Total	**64**	**100**

Practicals:

Intellectual skills:
1. Write the fields of data base
2. Decide proper specifications
3. Execute Query Processing and transaction processing.
4. Prepare appropriate data tables
5. Writing of Sequential steps

Note:
- All the experiments shall be performed using Oracle 8i or Higher Versions.
- Students shall maintain a lab manual, giving details of the work-carried out during every practical session.
- Assessment shall be done based on the lab manual. This lab manual shall be submitted as term-work.

List of Practical:

Sr. No.	Title of Experiment	No. of Hours
1	Designing E-R diagrams. Designing a Normalized Database.	04
2	Creating & Executing DDL commands in SQL. & Apply various Integrity constraints on table.	04
3	Creating & Executing DML commands in SQL.	04
4	Writing Queries using various operators & Arithmetic, String Functions.	06
5	Executing Data Conversion functions such as To_char(), To_Number() and To_date(). Execute various Date functions and also display special date formats using To_char() function.	04
6	Executing Queries using the Select Command with Where, Having ,Group by and order by clauses also execute the queries using aggregate functions.	06
7	Execute the queries for implementation of Inner, Outer and Cross Join.	04
8	Executing DCL commands in SQL.	02
9	Implementation of Views.	04
10	Execute Indexes, Sequences,, Snpashots and synonyms in SQL.	04
11	Write the basic PL/SQL Programs and also Write a PL/SQL programs using if then else, for , while and nested loop.	04
12	Write a PL/SQL code to implement implicit and explicit cursors.	02
13	Write PL/SQL Programs based on Exceptions handling.(Predefined and user-defined exceptions)	02
14	Write PL/SQL code for creating Procedures ,functions and database triggers.	06
15	Write a PL/SQL code to lock the table in shared mode and exclusive mode.	04
	Total	**64**

Learning Resources:
  1. **Books:**

Sr. No.	Author	Title	Publisher
1.	Korth	Database System Concepts(4th Edition)	Tata McGraw Hill
2.	ISRD Group	Introduction to Database Management Systems	Tata McGraw Hill
3.	SQL ,PL/SQL the Programming language of Oracle	Ivan Bayross(4th edition)	BPB
4.	Chakrabarti Dasgupta	Advanced Database Management System	Dreamtech

  2. **Websites:**
      1. wielyIndia.com or DreamtechPress.com
      2. http://phindia.com/gupta/chapter/chapter1.pdf
      3. www.williamstannings.com

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD/CW

Semester   : Third

Subject Title : Digital Techniques

Subject Code : 17333

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

NOTE:

> ➢ **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
> ➢ **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

Rationale:

The application areas of digital electronics have been increasing day by day, resulting in unprecedented interest in the subject. The power of digital techniques and systems can be seen from wide variety of industrial machinery, computers, microprocessors, house hold appliances, medical equipment, internet, e-banking etc. which are based on principles of digital electronics. So the subject Digital Techniques has been introduced as a core technology subject, in Computer Engineering Curriculum.

It will enable the students to assemble, design, test and troubleshoot logical circuits like:- MUX, DEMUX, COUNTERS, REGISTERS. This subject covers the number systems, basic & logic gates, combinational & sequential logic circuits, memories and ADC / DAC converters which form an important part of digital systems.
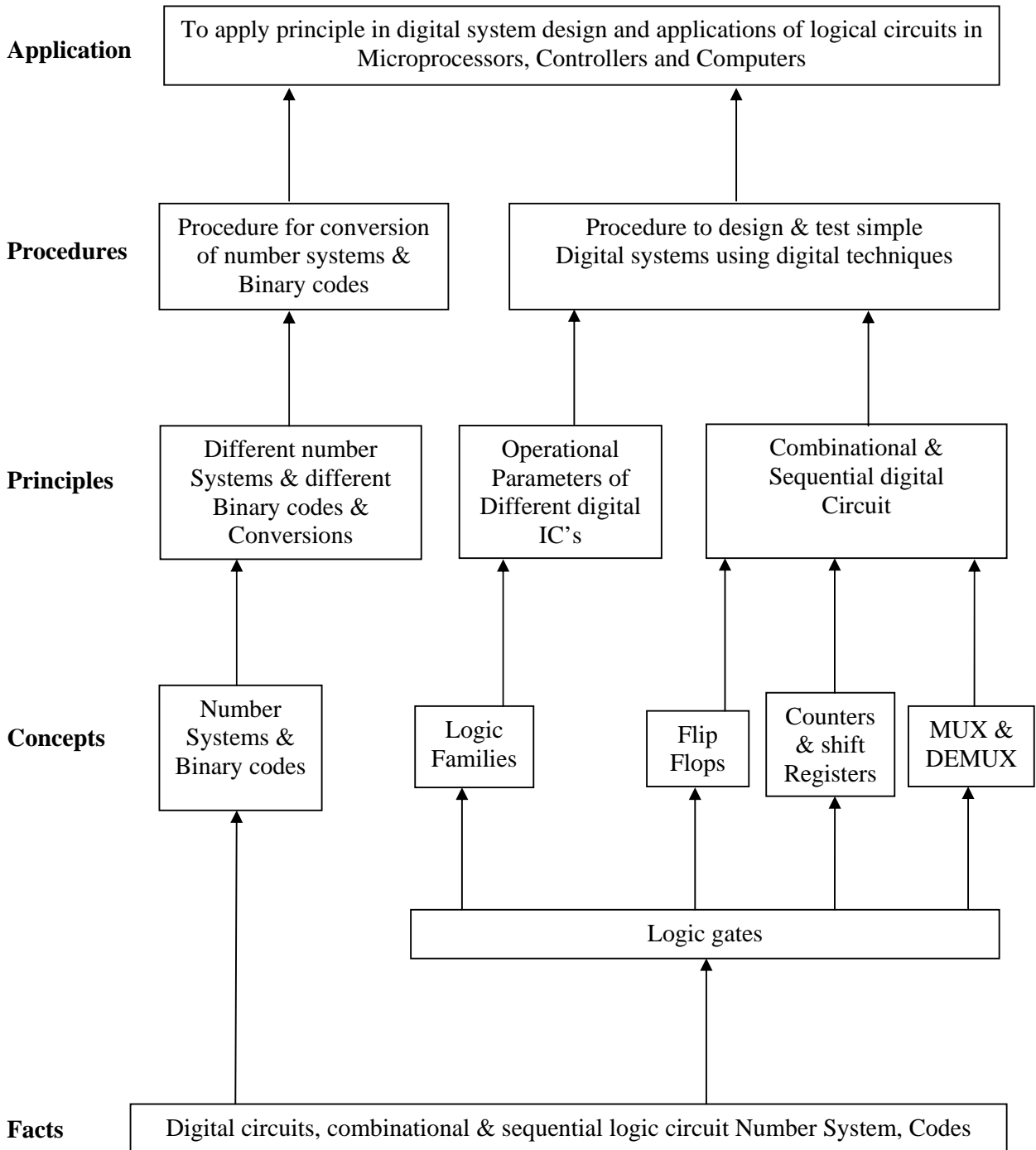
This subject is the foundation for knowledge of computers, Advanced Microprocessor and Embedded Systems.

Objectives:

The student will be able to:
1. Understand the Digital Systems and Logic Families
2. Select a logic gate for specific application
3. Draw ladder network diagrams

Learning Structure:

Application

To apply principle in digital system design and applications of logical circuits in Microprocessors, Controllers and Computers

↑   ↑

Procedures

Procedure for conversion of number systems & Binary codes

Procedure to design & test simple Digital systems using digital techniques

↑   ↑   ↑

Principles

Different number Systems & different Binary codes & Conversions

Operational Parameters of Different digital IC's

Combinational & Sequential digital Circuit

↑   ↑   ↑   ↑   ↑

Concepts

Number Systems & Binary codes

Logic Families

Flip Flops

Counters & shift Registers

MUX & DEMUX

↑   ↑   ↑   ↑   ↑

Logic gates

↑

Facts

Digital circuits, combinational & sequential logic circuit Number System, Codes

Theory

Topic No.	Name of the Topic	Hours	Marks

01	**Introduction to Digital Techniques**
	Objectives:-
	  ➢ Understand the Digital Systems and Logic Families.
	  ➢ Identification and conversion of different number systems.
	1.1 Digital signal , Digital systems- Positive and Negative Logic, Advantages , Disadvantages and Applications of Digital Systems
	1.2 Logic families- Characteristics, Classification - TTL, CMOS, ECL (Comparison only) (No circuits)
	1.3 Number System- Classification - Binary, Octal, Decimal, Hexadecimal number system, Conversion of number systems, 1's complement and 2's complement, Binary arithmetic, BCD code, BCD arithmetic.
		08	16

02	**Logic Gates** **Objectives:-** ➢ Understand Boolean Laws and concept of Logic Gates. 2.1 Basic gates (AND,OR, NOT), Universal gates(NAND, NOR), Derived gates(EX-OR, EX-NOR) - Logical symbol, logical expression and truth table of gates- Deriving all gates using universal gates, Multiple input gates (3 - inputs) 2.2 Boolean laws- De Morgan's theorems. **(10 Marks)** 2.3 Application of Boolean laws to simplify the Boolean expressions. 2.4 Construction of logical circuits by simplifying the Boolean Expression. **(08 Marks)**	08	18

03	**Combinational Logic Circuits**
	Objectives:-
	  ➢ Reduction of Boolean expression using K-map
	  ➢ Understanding and designing of Multiplexer, Demultiplexer, Encoder, and Decoder.
	3.1 SOP & POS – Concept, Standardization.
	3.2 K-map representation of logical functions minimization using 2, 3, 4 variables.
	3.3 Designing of (a) Half adder and Half subtractor (b) Full adder and Full subtractor using K-map, basic gates and universal gates.
	3.4 Multiplexer – Block diagram, Truth table, Logical expression and logic diagram of Multiplexers (2:1, 4:1, 8:1and 16:1), Multiplexer Tree.
	3.5 Demultiplexer – Block diagram, Truth table, Logical expression and logic diagram of Demultiplexer (1:2, 1:4, 1:8and 1:16), Demultiplexer Tree.
	
	(14 Marks)
	3.6 Priority Encoders - Decimal to BCD Encoder (IC 74147) and Octal to Binary (IC 74148) - Block diagram, Truth table.
	3.7 Decoder - BCD to 7-segment Decoder (IC 7447) - Block diagram, Truth table.
	3.8 Digital comparator IC (7485) - Block diagram, Truth table.
	3.9 ALU 74181
	
	(10 Marks)
		12	24

04	**Sequential Logic Circuit**
	Objectives:-
	   ➥ Understanding the concept one bit memory cell – Flip-flop and their Applications.
	4.1 Introduction to Sequential Logic Circuit – Difference between combinational and sequential circuit
	4.2 One-bit memory cell, clock signal – Triggering methods: edge triggering and level triggering (Positive and Negative)
	4.3 Flip Flops - R S flip-flop, Clocked R S flip flop, J-K flip flop, Master slave J-K flip flop, D- flip flop and T-flip flop - using NAND gates - Symbol , Logic diagram, working, truth table and Timing diagram. **(10 Marks)**
	4.4 Applications of flip flops –
	   a) Counters – Concept,
	      Modulus:- Types of counters, Comparison
	      Asynchronous counter (3 bit, 4 bit),
	      mod N-counter, Synchronous counter (3-bit) –
	      Designing, Working, Truth Table, Timing diagram and
	      Applications.
	   b) Shift register - SISO, SIPO, PISO, PIPO (4-bit) –
	      Block diagram, Working, Truth Table, Timing diagram and
	      Applications.
	      Universal Shift register (IC 7495) (Only pin diagram)
	            (14 Marks)
	4.5 Memories – Classification – Explanation of RAM, ROM, PROM, EPROM, E^2PROM. **(04 Marks)**
		14	28

05	**A-D And D-A Converters (No Mathematical Derivations)** **Objectives:-** ➥ To understand different Analog to Digital and Digital to Analog Conversion Techniques. 5.1 DAC - Weighted resistor and R-2R Ladder - Circuit diagram, working, Advantages and Disadvantages- DAC specifications 5.2 ADC - Ramp, Dual slope and Successive approximation - Circuit diagram, working, Advantages and Disadvantages- ADC Specifications.	04	08
	Total	**48**	**100**

Intellectual Skills:

1) Understand various logic families and number system
2) Understand Boolean Algebra and design the logic circuits
3) Design Combinational and Sequential Logic circuits using logic gates and their applications
4) Know different types of memories in computers
5) Understand the concept of data conversion from Analog to Digital and vice- versa

Motor Skills:

1) Ability to build the circuit.
2) To observe the result and handling the equipments.

List of Practical (Any TEN) including MINI PROJECT:-

Sr. No	Title of Experiments	No. of Hours
1	To know your laboratory of Digital Technique and Study of Digital IC datasheets and noting down the characteristics for TTL & CMOS logic families.	03
2	Verification of truth table of logic gates.	03
3	Verification of De Morgan's theorem.	03
4	Construction of Half adder and Full adder.	03
5	Implementation of Combinational Circuit using Multiplexer	03
6	Construction of 7-segment decoder driver.	03
7	Verification of truth table of Flip flops.	03
8	Universal Shift Register.	03
9	Decade counter using IC 7490.	03
10	Design of 3-bit Synchronous counter.	03
11	A MINI PROJECT (Design, Assemble, Test and Troubleshoot) integrating minimum two digital ICs	05

Learning Resources:

Books:

Sr. No.	Title	Author	Publisher
01	Modern Digital Electronics	R. P. Jain	Tata McGraw Hill
02	Digital Principles	Malvino Leach	Prentice Hall of India
03	Digital Fundamentals	Thomas Floyd	Pearson
04	Digital Electronics	Anil K Maini	Wiley Precise Text Book

CDs, PPTs, etc:

www.vikaspublishing.com/teachermanual.aspx

Website:

www.digitalcircuits.com

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD/CW

Semester   : Third

Subject Title : Graphic User Interface (GUI) Programming

Subject Code : 17026

Teaching and Examination Scheme

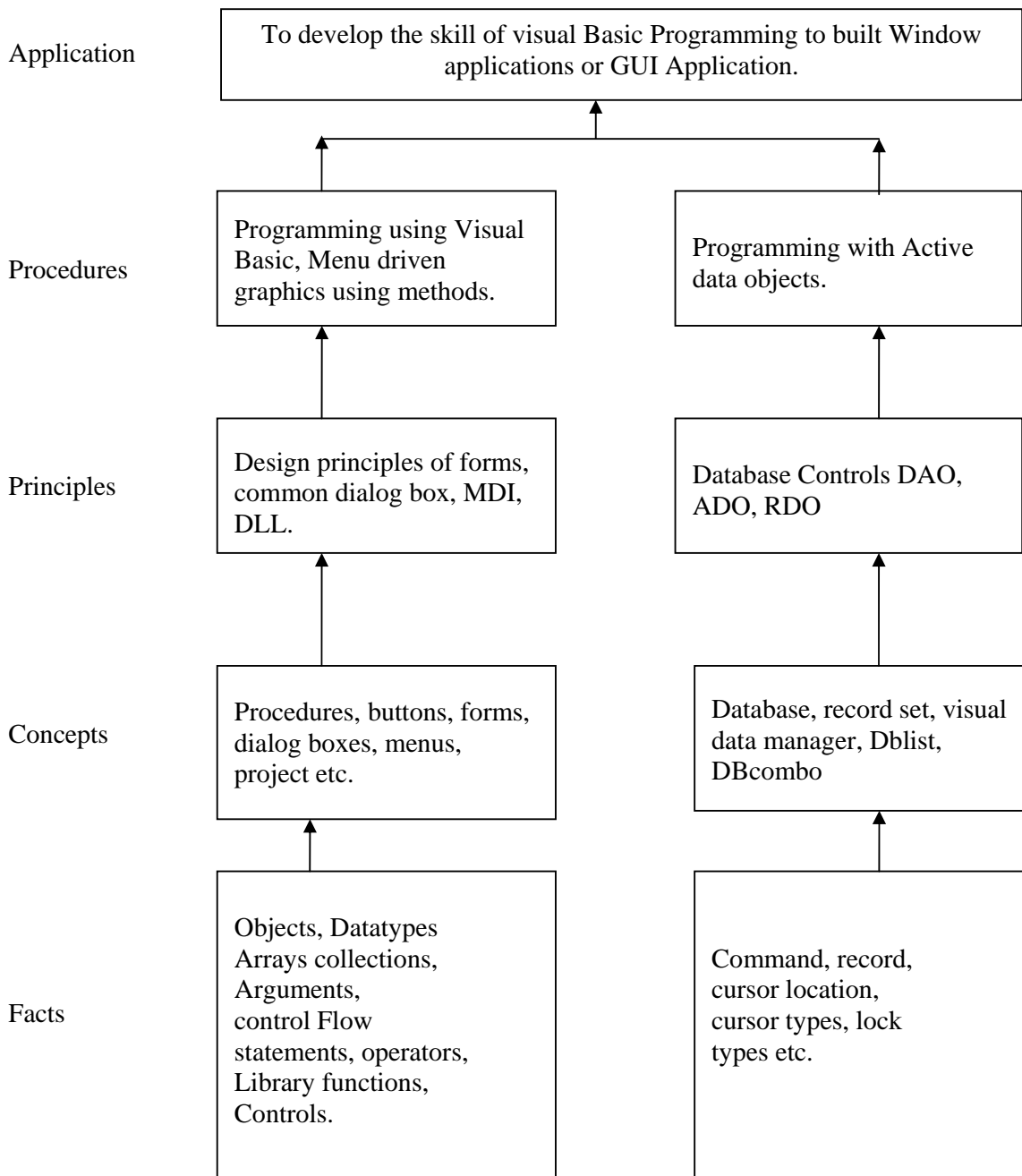| Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	02	--	--	50@	--	--	50

Rationale:

Nowadays, computer is being used in each and every organization to maintain their data. Graphical user interface (GUI) makes working with data easy and convenient.

GUI helps to understand the complete development environment, programming and data access tools. The contents are designed to understand and implement windows / desktop Applications.

The students will be able to design and develop windows applications. They can also understand and use the different categories of controls, data access technologies, working with forms.

Learning Structure:

Application	To develop the skill of visual Basic Programming to built Window applications or GUI Application.

Procedures	Programming using Visual Basic, Menu driven graphics using methods.	Programming with Active data objects.

Principles	Design principles of forms, common dialog box, MDI, DLL.	Database Controls DAO, ADO, RDO

Concepts	Procedures, buttons, forms, dialog boxes, menus, project etc.	Database, record set, visual data manager, Dblist, DBcombo

Facts	Objects, Datatypes Arrays collections, Arguments, control Flow statements, operators, Library functions, Controls.	Command, record, cursor location, cursor types, lock types etc.

Content:

Note: Contents of theory should be taught in practical period with the help of LCD projector.

Activity	Hours

• **Introduction to GUI Environment**
Theory
Introduction of GUI, Environment of VB, Concept of VB Program, Project forms and Controls.
Activity 1
   • VB 6.0 Installation with demonstration.
   • Introduction of different windows of VB, Windows forms and Controls.
Theory
   • Use of Class, Object, Property, Methods and events.
   • Drag & Drop Operations, Validating and Processing, user inputs, managing with menus.
Activity 2
   • Perform mathematical operation using Textbox and Labels.
	2

• **Introduction to Basic Concept of Visual Basic.**
 	
Theory Understand the basic concepts such as,
   • Data types, Variants.
   • Variables, Constants.
   • Arrays – REDIM statement, Array related functions.
   • Collection, procedure, functions.
   • Argument passing and return values.
   • Input box and message box.
   • Control flow statement.
   • Loop statement.
   • Nested control structure.
   • Exit statement.
   • Operators – arithmetic, logical, relational, string.
   • Functions – String, Math's, Date and Time.
   • Date and time formats.
   • Control loops (do, for, while)
   • Control statements (if-then, if-then-else, Selection option)
   • Using text box, Command button, Label, options, combo box, input and message box.
 Activity 3
   • To use date, time, string, mathematical function and control statement by using different controls.
	3

• **Working with Controls & Events.**
Theory
   • Command Buttons, Checkboxes, Option Button.
   • Scroll bars and Sliders.
   • Picture Boxes and Image Controls.
   • Chart and Grid Control
Activity 4
   • To change height, width of Image using Image control, picture box and Scrollbars.
Theory	

•   File system controls – drive, file, directory list box
               •   Container – frame.
               •   Events- load, Click, etc.
Activity 5
               •   Design a form using directory, drives, file list and dialog box controls.
Theory
               •   Text Box and Rich Text boxes
               •   List Box, Combo Box, Dialog Box.
Activity 6
               •   Design text Editor.
               •   Perform Cut, Copy, Paste, replace text and save file.
Theory
               •   Timer Control
               •   Basic controls like – line, shape, circle, RGB, Paint picture.
               •   Events- load, Click, etc
Activity 7
               •   Design Timer Control Application.
               •   Check Start, stop events in Timer.
	3

• **Module, Class Module, MDI, Menu Editor And Graphics**
Theory
               •   Concept of module, class module, MDI, DLL's and how to use them.
               •   Creating own menu using menu editor, popup menu.
               •   **Advanced controls:** Common dialog box, Tree view, List view, rich text box Control, windows common controls, status bar, tab control, image list, MSchart.
               •   Concept of class module, module MDI, DLL and how to use them Using RTF Control.
Activity 8
               •   Design MDI Form**.**
               •   Drag & Drop Menu Bar, status bar & tool bar on MDI.
	2

• **Introduction to Database Connectivity and Report Generation.**
Theory
               •   Concept of database, record, record set, connection DSN and DSN less connection
               •   Data bound controls – text box, combo box, list box, DB grid, DB Combo, MS flex grid.
               •   Visual Data Manager.
               •   Database Controls- ADO, DAO, RDO.
               •   Object connection, record set, parameter, cursor types, lock types.
Activity 9
               •   Use different database controls such as ADO, RDO, DAO to perform insert, delete, update operation on database records.
Theory   Concept of Crystal Report & Data report.
Activity 10
               •   Design Crystal Report.
               •   Use crystal report in application.
               •   It should get print by particular search criteria.
	3

• **A Mini Project In VB 6.0**(Teacher Shall Guide Topic on the above activities) **Theory** Guidelines about developing the projects.	

Activity 11 • Analyze the project. • Design the project. • Develop project as per specification. • Test the project. • Prepare the project for demonstration.	2

Intellectual Skills:

1) Design various types of forms.

2) Use of controls.

Motor Skills:

1) Develop windows application.

2) Develop crystal reports.

List of Practical:
Note: Any 8 out of 10 practicals will be performed by each student including Mini project.

1. Understand GUI Environment

   • Visual Basic : its importance

   • Installation on VB

   • Awareness of various elements of VB IDE

   • Form: its use, extension Controls and their use

2. Create a VB application to design simple calculator using Textbox, Labels and Command Button.

3. Create a VB application to use Date, Time, String, Mathematical, Function with the help of Textbox, Label, Radio Button, Check Box, Combo Box and Command button.

4. Create a VB application using chart and grid control.

5. Create a VB application using Directory, Drives, File List and Dialog Box control and display the available Directories, Drives, Files in the system.

6. Create a VB application using timer control with facility of start, stop, reset using command button and Text Box.

7. Create a Text Editor with Menu having Cut, Copy, Paste Replace Text and save File using RTF Control.

8. Create a MDI form including Menu Bar, Tool Bar, Tool Bar and Status bar and common dialog control.

9. Create a Database application using different database controls and perform insert, delete, update operations on database records and display data flexgrid / datagrid.

10. Create a crystal report and fetch records from the database to crystal report.

11. Develop a Mini Project.

Learning Resources:

Sr. No.	Author	Title	Publisher
1	Steven Holzner	Visual Basic 6 Programing (Black Book)	Dream Tech Press
2	Greg Perry with Sanjaya Hettihewa	SAMS Visual basic 6	Pearson
3	Bradley, Millspaugh	Programming in Visual Basic 6.0	Tata McGraw Hill
4	Mahmmod Azam	Programming with Visual Basic 6.0	Vikas Publishing House.

Web links:

For Tutorials: www.vbtutor.net/vb6

Software Tool:-
                    Visual Basic 6.0 or Higher Versions.

Course Name : Computer Engineering Group

Course Code : CO/CM/IF/CD/CW

Semester   : Third

Subject Title : Professional Practices-I

Subject Code : 17027

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	03	--	--	--	--	50@	50

Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide a platform to students to undergo activities which will enable them to develop self confidence. Industrial visits, expert lectures, seminars on technical topics and group discussions are planned in a semester so that there will be increased participation of students in learning process.
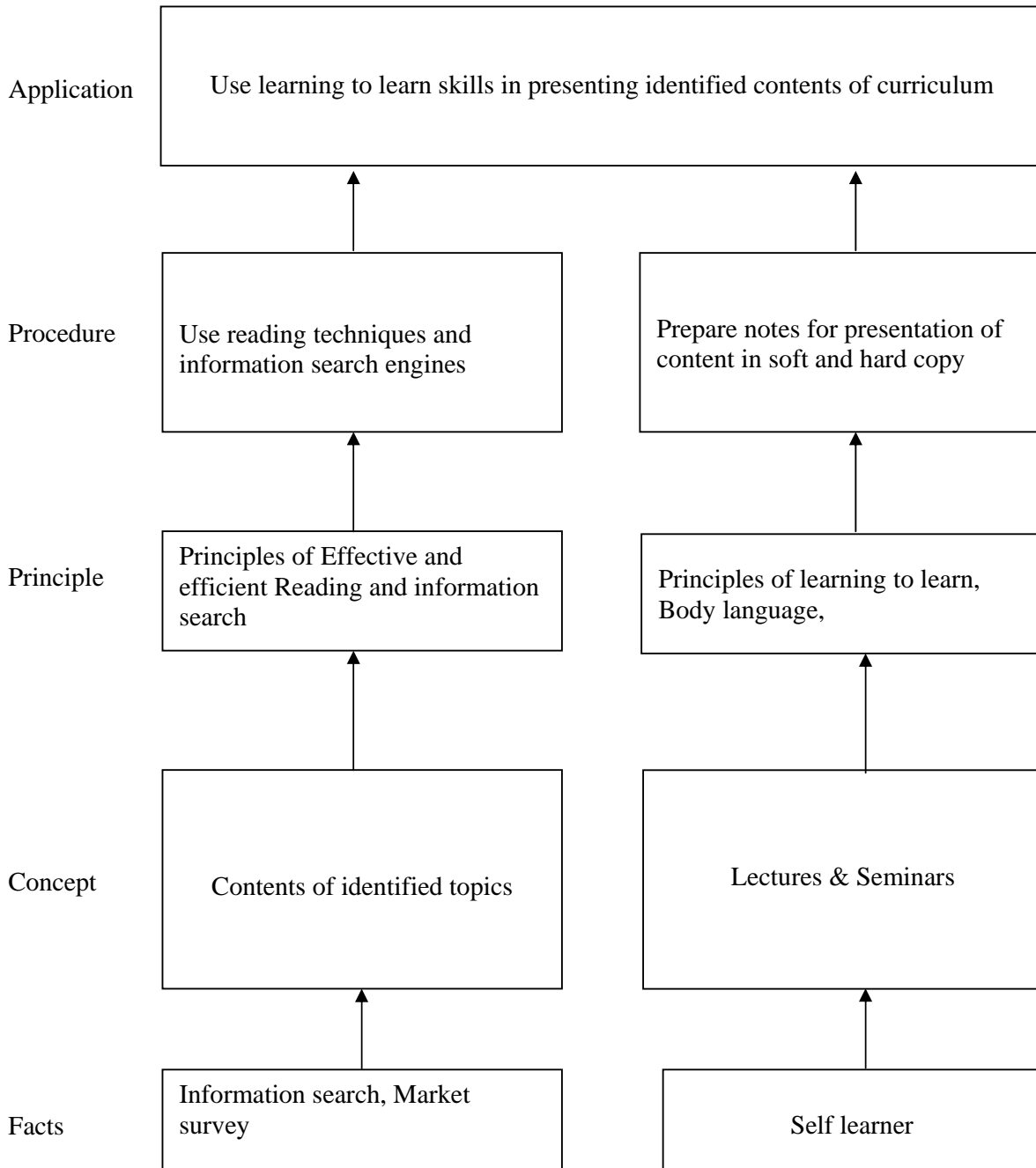
Objectives:

Intellectual Skills:

Student will be able to:

1. Acquire information from different sources.
2. Prepare notes for given topic.
3. Present given topic in a seminar.
4. Interact with peers to share thoughts.
5. Prepare a report on industrial visit, expert lecture.

Learning Structure:

Application	Use learning to learn skills in presenting identified contents of curriculum	

↑   ↑

Procedure	Use reading techniques and information search engines	Prepare notes for presentation of content in soft and hard copy

↑   ↑

Principle	Principles of Effective and efficient Reading and information search	Principles of learning to learn, Body language,

↑   ↑

Concept	Contents of identified topics	Lectures & Seminars

↑   ↑

Facts	Information search, Market survey	Self learner

Contents:

Activity	Name of Activity	Hours
01	**Information Search :** Collect information from internet / newspaper / periodicals / magazines etc. Groups (4 to 5 students) have to search/collect information about any one of the following topic. Students will have to submit a report of about 5-10 pages. i) Manufacturing and costing of Computer hardware and software. ii) Advances in software Technology. iii) Information search related to IT Companies (Working Environment) iv) Information search related to Hardware & Networking Companies (Products and Features) v) E-Business. vi) Making a business plan. Vii) Information about Legendary Personalities through suitable websites (eg. youtube).	08
02	**Lectures by Professional / industrial Expert to be organized from the following areas (any one)** 1. Project presentation tips. 2. Spoken English. 3. Personality development. 4. Current trends in IT. 5. How to develop positive thinking.	08
03	**Market Survey:** a) A group of four students is expected to Collect 4 to 6 advertises showing job opportunities for C++, RDBMS, Java ,VB, .Net, hardware engineer etc. from newspaper and online resources as well as personally visiting the relevant industries and offices. b) Visit any one industry and find the knowledge and skills required for C++, RDBMS, Java Technologies. May also Visit related website.	10

04	**Seminar:**
	Seminar on any one of the following topics suggested below:
	A Group of students (4 to5)has to search / collect information about the topic through literature survey, visit and discussions with experts/ concerned persons:
	Student will have to submit a report of about 5- 10 pages and deliver a seminar for 10 minutes.
	    1) 3G/4G Technology.
	    2) Cloud Computing.
	    3) Hacking.
	    4) Robotics.
	    5) DNA Computing.
	    6) Nano Technology.
	    7) Robot Surgery.
	    8) HD Technology.
	    9) Smartphones.
	    10) ERP/SAP.
	        Faculty can suggest any other latest topic.
		10

05	**List of Mini Projects (Any One).**
	    1. Hotel reservation software
	      (may use-C,C++,RDBMS,VB)
	    2. Library management software (may use C ,C++, RDBMS, VB)
		12

	3. Student data management software (may use C C++,RDBMS,VB) 4. Small Hardware, electronics, embedded, toys,animation based Projects. 5. Any Small Games (e.g Tic-Tac-Toe). b) Exhibition of Mini Project on department level. c) Making different charts for laboratory related to technical subjects.	
	Total	**48**

Learning Resources:
Books:

Sr. No.	Title	Author	Publisher
1	Personality Development and soft skills	Barun K. Mitra	Oxford University Press
2.	Entrepreneurship	Rajeev Roy	Oxford University Press
3	Second & Third semester subjects reference Books	--	--
4	Journals and magazines – IEEE Journals, IT Technologies	--	--
5	Local newspapers and events	--	--

Websites:
1. http://www.oupinheonline.com
2. http://www.seminarforyou.com