 MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI																	
TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES																	
COURSE NAME : ELECTRONICS ENGINEERING GROUP (EXCEPT ELECTRONICS AND VIDEO ENGINEERING)																	
COURSE CODE : EJ/EN/ET/EX/IS/IC/DE/IE/MU/IU/ED/EI																	
DURATION OF COURSE : 6 SEMESTERS for EJ/EN/ET/EX/IS/IC/DE/IE/MU (8 SEMESTERS for IU/ED/EI) WITH EFFECT FROM 2009-10																	
SEMESTER : SECOND DURATION : 16 WEEKS																	
FULL TIME / PART TIME : FULL TIME SCHEME : E																	
SR. NO.	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										SW (16002)
				TH	TU	PR	PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)			
1	Communication Skills	CMS	12012	02	--	02	3	100	40	--	--	25#	10	25@	10	50	
2	Engineering Mathematics	EMS	12013	03	01	--	3	100	40	--	--	--	--	--	--		
3	Applied Science (Electrical / Electronics)	ASE	12021	04	--	04	3	100	40	50@	20	--	--	--	--		
4	Electronic Components & Applications	ECA	12031	04	--	02	3	100	40	50#	20	--	--	25@	10		
5	Electronics Engineering Workshop	EEW	12032	--	--	04	--	--	--	--	--	--	--	50@	20		
6	Development of Life Skills-I	DLS	12018	01	--	02	--	--	--	--	--	25#	10	25@	10		
7	Professional Practices-II	PPS	12033	--	--	02	--	--	--	--	--	--	--	50@	20		
Total				14	01	16	--	400	--	100	--	50	--	175	--	50	
Student Contact Hours Per Week: 31 Hrs.																	
THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.																	
Total Marks : 775																	
@ Internal Assessment, # External Assessment, <div></div> No Theory Examination.																	
Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, ,OR-Oral, TW- Termwork, SW- Sessional Work																	
➤ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subject are to be converted out of 50 marks as sessional work.																	
➤ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms																	
➤ Code number for TH, PR, OR, TW and SW 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/CD/CE/CH/CM/CO/CR/CS/CV/DE/ED/EE/EI/EJ/EN/EP/ET/EV/EX/
FE/IC/IE/IF/IS/IU/ME/MH/MI/MU/PG/PS/PT/SC/CC/EC/MC**

Semester : Second

Subject Title : Communication Skills

Subject Code : 12012

Teaching and examination scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
02	--	02	03	100	--	25#	25@	150

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)

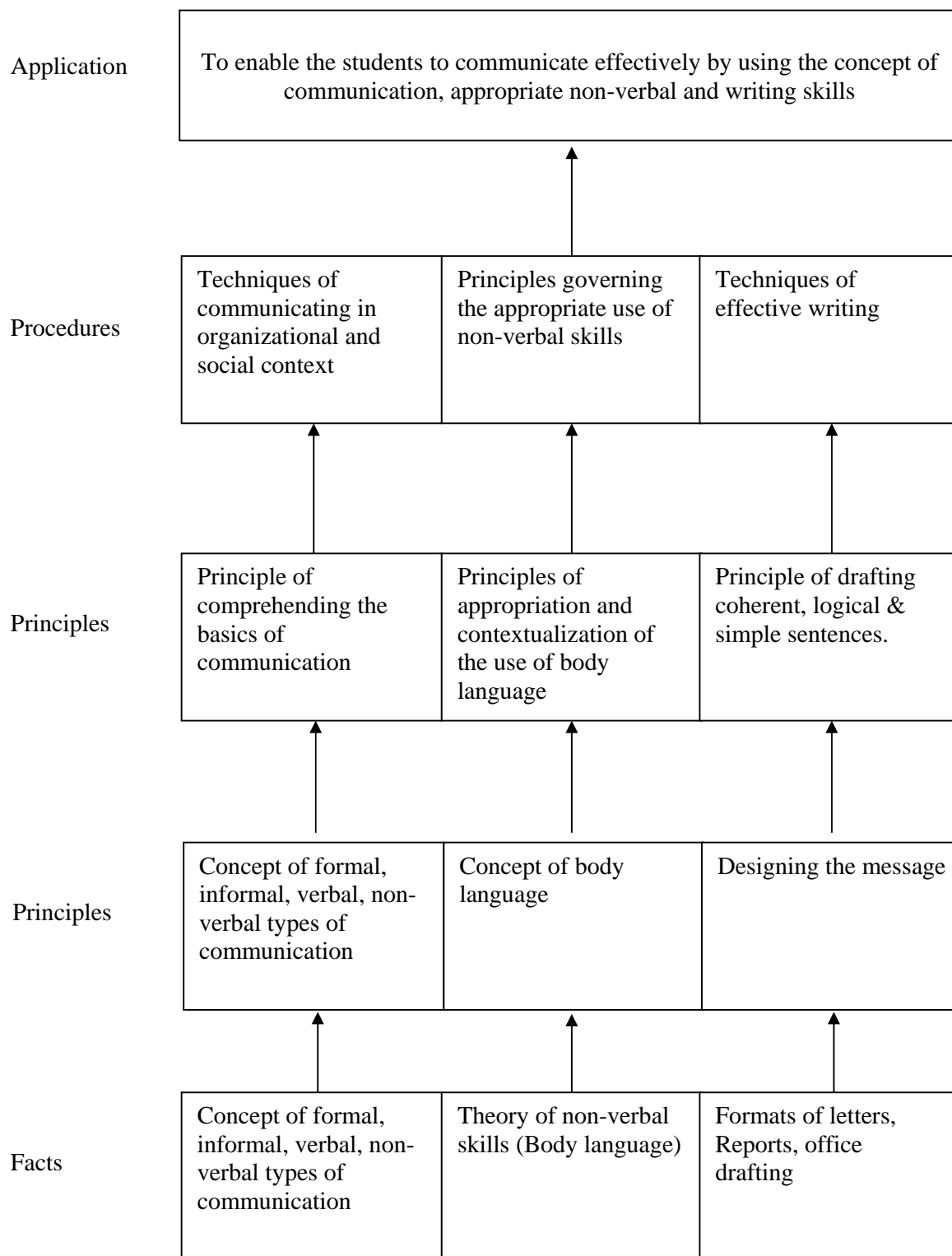
Rationale:

The Students have been already been exposed to the Language Skills pertaining to English, leading to a better understanding of English & use of grammar, developing a base for the language. Now with a view to achieve some mastery over the language & to develop Communication Skills, which is the main objective of this subject, the basic concepts of communication, Non-verbal and written skills have been Introduced.

Objectives:

The Students will be able to:

- 1) Understand and use the basic concepts of communication and principles of effective communication in an organized set up and social context.
- 2) Give a positive feedback in various situations, to use appropriate body language & to avoid barriers for effective communication.
- 3) Write the various types of letters, reports and office drafting with the appropriate format.

Learning Structure:

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	Introduction to communication: 1.1 Definition, communication cycle., 1.2 The elements of Communication: sender- message – channel - Receiver - Feedback. 1.3 Concept of Communication Process. 1.4 Stages in the process: defining the context, knowing the audience, designing the message, encoding, selecting proper channels, transmitting, receiving, decoding and giving feedback. (Case lets.)	04	14
02	Types of communication 2.1 Formal Communication. 2.2 Formal: Types – a) Vertical Communication. b) Horizontal Communication. 2.3 Informal: Types – a) Diagonal Communication. 2.4 Verbal Vs Non-Verbal Communication. 2.5 Verbal: Types- a) Oral Communication. b) Written Communication. 2.6 Non-Verbal: Types- a) Body Language. b) Graphic Language.	04	08
03	Principles of Effective Communication : 3.1 Principles of Effective Communication. (One example each.) 3.2 Communication barriers & how to overcome them. 3.3 Developing effective messages: Thinking about purpose, knowing the audience, structuring the message, selecting proper channels, minimizing barriers & facilitating feedback. (Examples: Writing articles for newspapers, magazines.)	04	16
04	Non verbal- graphic communication: 4.1 Non- verbal codes: A- Kinesics , B- Proxemics , C – Haptics D-Vocalics , E- Physical appearance. F -Chronemics , G –Artifacts. (One example each.) Marks: 08 4.2 Aspects of Body Language. Types of Body Language. (One example each.) Marks: 06 4.3 Interpreting visuals & illustrating with visuals like tables, charts & graphs. Marks: 08	08	22
05	Formal written skills : 5.1 Office Drafting: Circular, Notice, and Memo. Marks: 06 5.2 Job Application with resume. Marks: 08 5.3 Business correspondence: Enquiry, Order letter, Complaint letter, and Adjustment letter. Marks: 06 5.4 Report writing: Accident report, Fall in production, Progress Report,, Investigation Report. Marks: 08 5.5 Defining, Describing Objects & Giving Instructions. Marks: 04 5.5.1 Defining Objects- Appearance, It's Use. 5.5.2 Describing Objects- Purpose, Components, Functions, Applications. 5.5.3 Giving Instructions- Precise, Directive, Imagistic Statements of a futuristic stance.	12	40
Total		32	100

Assignments:

1. Communication Cycle (With the Help of Diagram) + Any two communication situations to be represented with the help of Communication Cycle. (Use Pictures)
2. Communication Situations (List of 5 Communication situations stating the type of communication viz; Vertical, Horizontal, Diagonal.
3. Barriers That Hinder a Particular Communication Situation. (State the type of barrier, and how to overcome them). (04 Caselets)
4. Writing articles (two) in keeping with the parameters of developing effective messages. (Collect samples from newspapers, articles, Internet and paste them in the assignment.)
5. Business Letters: a) Job Application with Resume.
b) Enquiry Letter.
c) Order Letter.
d) Complaint Letter.
6. Non-Verbal Communication:
a) Body Language.: Five Illustrations of appropriate use of Body Language used on the part of student in formal and Informal setups. (Example- formal setup- classroom
b) Graphic Language: Five Illustrations of the use of Signs, Symbols, Colours, Maps, Graphs, Charts in day to day life.
7. Presentation Skills: Select topic (current issues) and ask students to give a class presentation as per the principles of effective communication and paste these topics as an assignment in the file.
8. Non-Verbal Codes: Kinesics, Physical Appearance, Haptics. (Collect five pictures per group of five students on the above mentioned non-verbal codes, analyse and discuss them in the class. Ask the students to paste these pictures along with explanation in their individual files.

GUIDELINES: Teachers can make use of group discussions, class presentations, role plays, simulations, caselets, listen and repeat drills with the help of cassettes etc to give a hand on experience for students.

Students should maintain the Institute Files to write all the eight assignments with proper Index and get it duly certified.

Learning Resources:**Books:**

Sr. No.	Author	Title	Publisher
01	MSBTE, Mumbai.	Text book of Communication Skills.	MSBTE, Mumbai.
02	M.Ashraf Rizvi	Effective Technical Communication	Tata McGraw Hill Companies.
03	Krushna Mohan, Meera Banerji	Developing Communication Skills	Macmillan
04	Joyeeta Bhattacharya	Communication Skills.	Reliable Series
05	Jayakaran	Every ones guide to effective writing.	Apple Publishing.
06	Website: www.mindtools.com/page8.html -99k		
07	Website: www.khake.com/page66htm/ -72k		
08	Website: www.BMConsultant India.Com		
09	Website: www.letstak.co.in		
10	Website: www.inc.com/guides/growth/23032.html -45k		

Course Name : All Branches of Diploma in Engineering and Technology.

**Course Code : AE/CD/CE/CH/CM/CO/CR/CS/CV/DE/ED/EE/EI/EJ/EN/EP/ET/EV/EX/ FE/
IC/IE/IF/IS/IU/ME/MH/MI/MU/PG/PS/PT/CC/CI/CL/EC/EG/IL/MC/MG**

Semester : Second

Subject Title : Engineering Mathematics

Subject Code : 12013

Teaching and examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	01	--	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:

In 21st century man has developed new disciplines like Information Technology Genetic Engineering, Biotechnology etc. on the basis of Mathematics. Thus the study of mathematics is necessary to develop in the student the skills essential for these new disciplines. The subject is extension of basic mathematics of First Semester and stepping into the prerequisites to learn applied mathematics. Engineering Mathematics lay down the foundation to understand and express principles and laws involved in other technological subjects.

Objective: The student will be able to

Acquire knowledge of Mathematical terms, concepts, principles and different methods. Develop the ability to apply mathematical methods to solve technical problems, to execute management, plans with precision. Acquire sufficient mathematical techniques necessary for daily and practical problems.

Learning Structure:

Application:	Relationship between two quantities that vary, continuity of curves	Use of derivatives in applications. Slope of a curve	Analysis of experimental data for drawing valid conclusions and decision-making process.	To understand various physical quantities. Understanding signal processing, laws of impedance fluid flow, electricity.
Procedure:	To explain value of function & types of fun. Methods to evaluate limits of different functions.	To explain methods for finding derivative of different function. Second order derivative.	To explain measures of central tendency and dispersion addition and multiplication	Explain geometric meaning of deri., max,& mini, rates, radius of curvature. algebra of complex numbers Euler's forms, hyperbolic function.
Concept:	Dependent and independent variables. Standard formulae for Limits. Theorems on Limit	Derivatives of Standard functions. Rules of Differentiation	Classification of data, frequency, mean, mode and median. Sample space, event occurrence of event & types.	Slope of the curve, increasing decreasing functions. Real and imaginary parts of complex no. Euler's exponential forms.
Facts:	Concept of interval, neighborhood of a point, Definition of function and limit. Meaning of $X \rightarrow a$	Definition of derivative and notation, order of derivative	Concept of data, frequency distribution, attribute and variant.	First order and second order derivatives. Number system. Imaginary unit.

Contents: Theory**Note:**

1. Chapters 1 to 5 are common for all branches.
2. Chapter 6-For Civil, Electrical, Mechanical and Electronics groups
3. Chapter 7 & 8-For Computer Engineering Group.

Chapter	Name of the Topic	Hours	Marks
01	Function and Limit 1.1 Function 1.1.1 Definitions of variable, constant, intervals such as open, closed, semi-open etc. 1.1.2 Definition of Function, value of a function and types of functions, Simple Examples..	04	08
	Limits 2.1 Definition of neighborhood, concept and definition limit. 2.2 Limits of algebraic, trigonometric, exponential and logarithmic functions with simple examples		
02	Limits 2.1 Definition of neighborhood, concept and definition limit. 2.2 Limits of algebraic, trigonometric, exponential and logarithmic functions with simple examples	08	16
03	Derivatives 3.1 Definition of Derivatives, notations. 3.2 Derivatives of Standard Functions 3.3 Rules of Differentiation. (Without proof). Such as Derivatives of Sum or difference, scalar multiplication, Product and quotient. 3.4 Derivatives of composite function (Chain rule) 3.5 Derivatives of inverse and inverse trigonometric functions. 3.6 Derivatives of Implicit Function 3.7 Logarithmic differentiation 3.8 Derivatives of parametric Functions. 3.9 Derivatives of one function w.r.t another function 3.10 Second order Differentiation.	14	24
4	Applications Of Derivative 4.1.1 Geometrical meaning of Derivative, 4.1.2 Maxima and minima 4.1.3 Radius of Curvature	06	12
05	Statistics 5.1 Measures of Central tendency (mean, median, mode) for ungrouped and grouped frequency distribution. Marks 08 5.2 Graphical representation (Histogram and Ogive Curves) to find mode and median Marks 06 5.3 Measures of Dispersion such as range, mean deviation, Standard Deviation, Variance and coefficient of variation. Comparison of two sets of observations. Marks 10	10	24
NOTE: Chapter 6 is for Civil, Electrical, Electronics and Mechanical Groups			
06	Complex number 6.1 Definition of Complex number. Cartesian, polar, Exponential forms of Complex number. 6.2 Algebra of Complex number (Equality, addition, Subtraction, Multiplication and Division) 6.3 De-Moivre's theorem (without proof) Examples based on it,	06	16

	roots of complex numbers, roots of unity 6.4 Euler's form of Circular functions, hyperbolic functions and relations between circular & hyperbolic functions		
Note: Chapter 7 and 8 is for Computer Engineering Group Only			
07	Numerical Solution of Algebraic Equations Bisection method, Regula-Falsi method and Newton-Raphson method	03	08
08	Numerical Solution of Simultaneous Equations Gauss elimination method Iterative methods-Gauss Seidal and Jacobi's method	03	08
Total		48	100

Tutorial

Note: Tutorials are to be used to get enough practice for solving problems. It is suggested that in each tutorial at least five problems to be solved.

Tutorial No.	Topic on which tutorial is to be conducted
1	Function
2	Limits
3	Derivative
4	Derivative
5	Derivative
6	Statistics
7	Statistics
8	Statistics
9	Application of derivative/numerical Solution of algebraic equations
10	Application of derivative/numerical Solution of algebraic equations
11	Complex Numbers/Numerical Solution of Simultaneous Equations
12	Complex Numbers/Numerical Solution of Simultaneous Equations

Learning Resources:**Books:**

Sr. No	Title	Authors	Publications
1	Mathematics for Polytechnic	S.P. Deshpande	Pune Vidyarthi Griha Prakashan, Pune.
2	Calculus :Single Variable	Robert T Smith	Tata McGraw Hill
3	Advanced Engineering Mathematics	Dass H. K.	S. Chand Publication, New Delhi
4	Fundamentals of Mathematical Statistics	S.C Gupta and Kapoor	S. Chand Publications New Delhi.
5	Higher Engineering Mathematics	B.S Grewal	Khanna Publication, New Delhi
6	Applied mathematics	P. N. Wartikar	Pune Vidyarthi Griha Prakashan, Pune.

Course Name : Electronics and Electrical Engineering Group**Course Code : DE/ED/EE/EI/EJ/EN/EP/ET/EV/EX/IC/IE/IF/IS/IU/MU/EC/EG/IL****Semester : Second****Subject Title : Applied Science (Electrical/Electronics)****Subject Code : 12021****Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	--	04	03	100	50@	--	--	150

- Note I :**
1. Two periods each for theory and Practical will be used for Applied Physics and Applied Chemistry respectively
 2. Theory paper will have two parts one for Applied Physics and one for Applied Chemistry. Each will have same weightage of 50 marks.
 3. Practical Marks will be divided equally between Applied Physics and Applied Chemistry

NOTE II:

- **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)**

Part A: Applied Physics (12021)**Rationale:**

Physics provides foundation for core technology subjects. Understanding of any subject is entirely depending on logical thinking and hierarchy of knowledge component. As Physics is considered as basic science its principles, laws, hypothesis, concepts, ideas are playing important role in reinforcing the knowledge of technology.

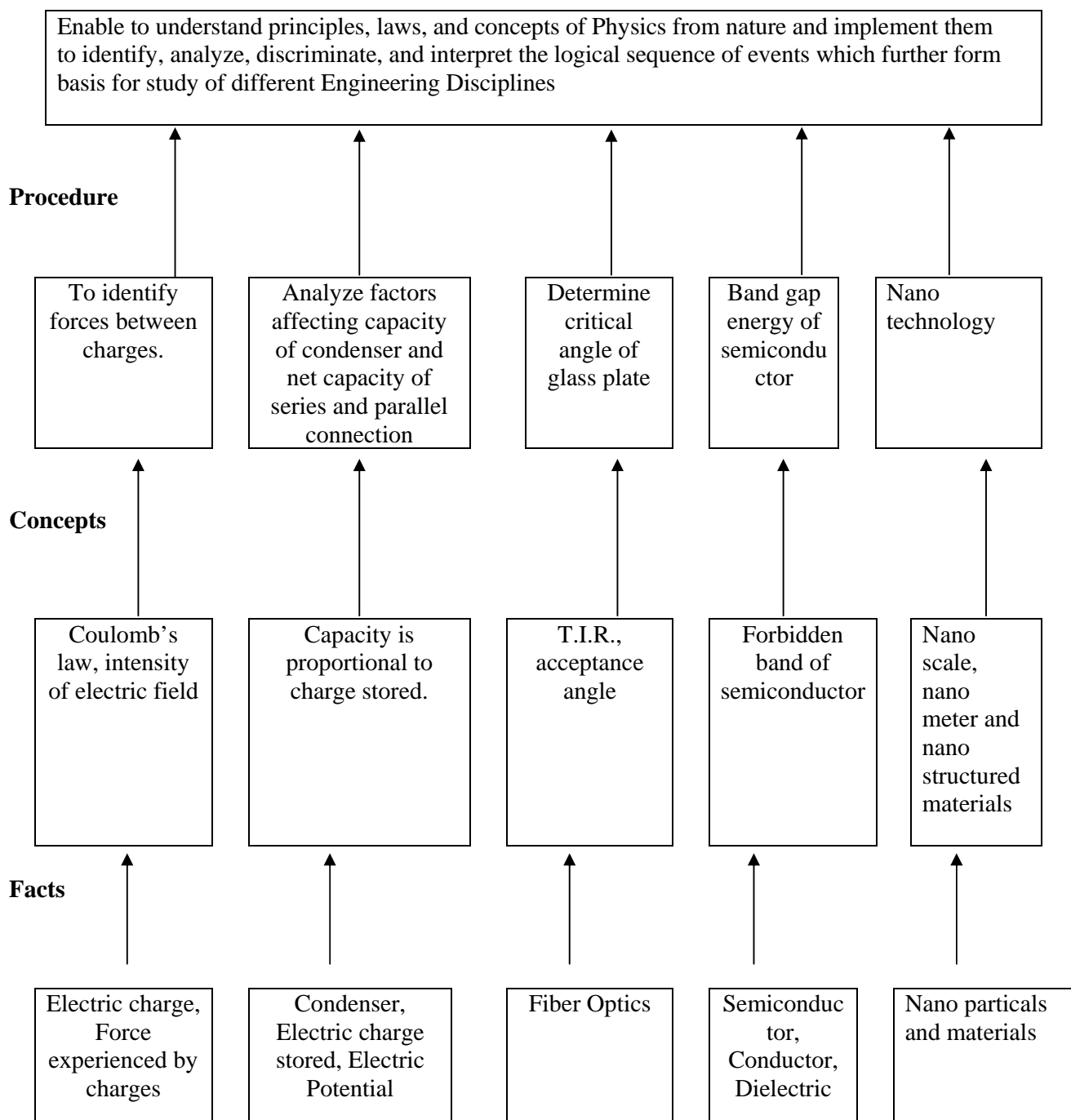
Deep thought is given while selecting topics in physics. They are different for different groups. This will provide sound background for self-development in future to cope up with new innovations. Topics are relevant to particular programme and student will be motivated to learn and can enjoy the course of Physics as if it is one of the subjects of their own stream.

Objectives: The Student will be able to:

1. Analyze different factors on which capacitance depends.
2. Differentiate between field intensity and potential.
3. List advantages of optical fiber.
4. Describe principle of working of optical fiber.
5. Differentiate between conductor, insulator and semiconductor on the basis of band Theory.
6. State the effect of variation of resistance of material at very low temperature.

Learning Structure

Applications



Chapter	Name of Unit	Hrs	Mks
1	Electric Field and Potential 1.1 Electric field Electric charge, Coulomb's inverse square law, Definition of unit charge, Electric field, Electric lines of force and their properties, Electric field intensity, Electric flux, Electric flux density, Relation between field intensity and flux density, Electric field intensity due to charged sphere (Numericals on Coulombs law, Electrical Intensity)	06	10
	1.2 Electric Potential Concept of potential, Definition and unit, Potential due to point charge using integration method, Potential difference between two points, Absolute potential, potential due to charged sphere, Definition of dielectric strength and breakdown potential. (Numericals on electric potential, potential due to charged sphere)	05	08
2	Condenser Capacity of condenser-Definition and unit, 1 Farad capacity, Principle of condenser, Capacity of parallel plate condenser, Series and parallel combination of condensers, Energy of charged condenser, Types of condensers –variable air condenser, condenser with solid dielectric- paper, mica and ceramic, electrolytic condenser(construction ,working voltage range and capacitance). (Numericals on capacity of parallel plate condenser, series and parallel combination, energy of condenser)	06	10
3	Fiber Optics Introduction, Total internal reflection, critical angle, acceptance angle, Structure of optical fiber, Numerical Aperture, Fiber optic materials, Types of optical fibers, Applications in communication systems. (Numerical on critical angle, numerical aperture, acceptance angle)	06	10
4	Band Theory of Solids Energy levels in solids, Valence, conduction and forbidden band, Conductors, Semiconductors and Insulators, Intrinsic and Extrinsic Semiconductors, p-type and n-type semiconductor, P-N junction diode-forward and reversed biased characteristics. (no numericals)	06	08
5	Introduction to Nanotechnology Definition of nanoscale, nanometer, nanoparticle, Definition and examples of nanonstructured materials, applications of nanotechnology- electronics, automobiles, medical, textile, cosmetics, environmental, space and defence (no numericals).	03	04
Total		32	50

Practical:

Skills to be developed:

Intellectual skills:

- Selection of measuring instruments
- Read and interpret the graph.
- Interpret the results from observations and calculations.
- Use these results for parallel problems

Motor skills:

- Proper handling of instruments.
- Measuring physical quantities accurately.
- To adopt proper procedure while performing the experiment.

List of Practical:

1. To determine effective capacitance of series combination and parallel combination by calculating its reactance.
2. To verify Total internal reflection (T.I.R) phenomenon for given glass slab and to calculate critical angle of incidence.
3. To determine forbidden energy gap in a semiconductor.
4. To Calculate Permittivity of Air by using Flat Condenser plates.
5. To determine Joule's constant (J) by electrical method.
6. To calculate refractive index of material of prism using spectrometer device.
7. To determine temperature co-efficient of resistance of metal (conductor) using Platinum resistance thermometer.
8. To determine I-V Characteristics of PN junction diode.
9. To Verify Ampere's rule using Oersted's Experiment and find Variation of intensity of magnetic field with Current and Distance.
10. To convert galvanometer into an ammeter of required range using appropriate value of shunt.
11. To calibrate voltmeter of required range by using potentiometer.
12. To measure the numerical aperture of the plastic fiber using 660 nm wavelength LED. (Take at least 5 different plastic fibers)

Learning Resources:**Books:**

Sr. No.	Name of the Book	Author	Publisher
01	Physics-I	V.Rajendran	Tata McGraw-Hill
02	Applied physics	Arthur Beiser	Tata McGraw-Hill
03	Engineering Physics	R. K. Gaur & S. L. Gupta	Dhanpatral
04	Physics	Rensic and Halliday	John Wiley 6 th ed.
05	Nano- Technology- principles and practices	Dr. S. K.Kulkarni	Capital Publishing Company

Web sites:

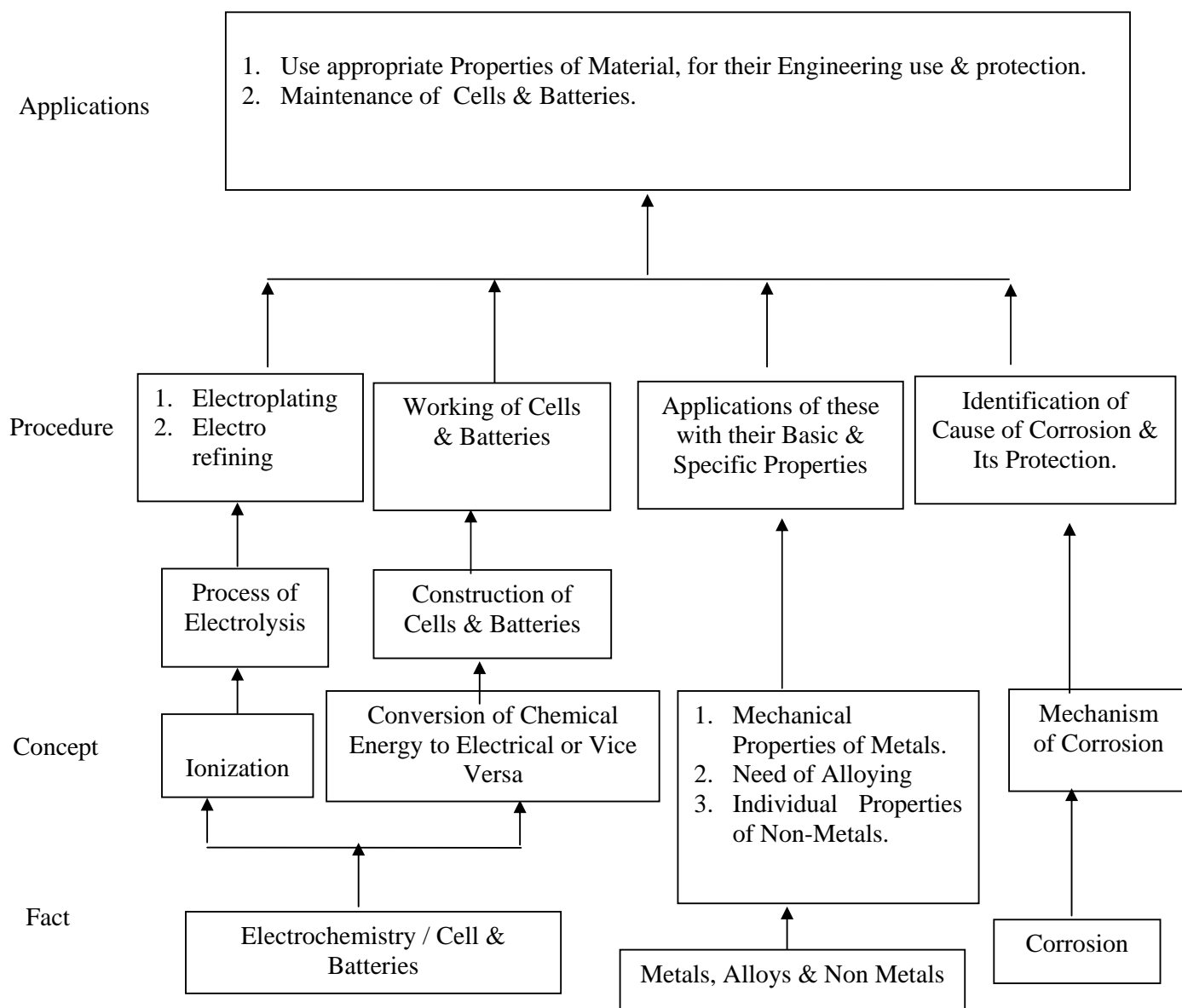
- 1) www.hyper-physics.com
- 2) www.physics.org
- 3) www.physics.about.com
- 4) www.physicsclassroom.com

Part B: Applied Chemistry (12021)**RATIONALE**

This syllabus of chemistry for electronics & electrical students is classified under the category of applied science. It is intended to teach students the working of cells & batteries, selection of various materials for engg. applications & their protection by metallic coatings.

OBJECTIVES

1. Apply knowledge to correlate the properties of materials, their engg. uses & protection.
2. Able to learn working of cells & batteries.

LEARNING STRUCTURE:

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	Electrochemistry Conductivity of Electrolytes – Concept of Ohms Law, Specific Conductivity, Specific Resistance, Equivalent Conductivity & Molar Conductivity, Variation of Specific & Equivalent Conductance with dilution, Definition of Cell Constant, Concept of pH & pOH and Numericals, Applications of pH, Buffer Solutions.	02	04
02	Cell And Batteries Definition of Electrochemical Cell, Battery, Charge, Discharge, Closed Circuit Voltage, Open Circuit Voltage, Electrochemical Couple, Internal Resistance, Separator, E.M.F., Classification of Batteries Such as Primary, Secondary & Reserve Batteries, Construction, Working & Applications of a Primary Cell Such as Lachlanche Cell & Daniel Cell, Secondary Cell Such as Ni – Cd Cell, Examples of Reserve Batteries, Hydrogen Oxygen Fuel Cell its Chemical Reactions, Advantages and Limitations, Introduction of Solar Cell.	08	12
03	Non-Metallic Engineering Materials 3.1 Insulators (Marks 2) Definition of Dielectrics and Insulators, Classifications of Insulating Materials, Properties & Applications of Inert Gases, Silicone Fluids, Mineral Oil or Transformer Oil, Teflon, Epoxy Resin, Ceramics, Glass, Mica, Mylar. 3.2 Adhesives: (Marks 4) Definition, Characteristics, advantages of adhesives, examples such as phenolformaldehyde resin, ureaformaldehyde resin, epoxy resin- their properties and applications as an adhesives. 3.3 Ceramics : (Marks 4) Definition, Properties and Engg. Applications, Types- Structural ceramic, Facing material, , Fine Ceramics, Special Ceramics and Refractories.	06	10
04	Metals & Alloys Definition of Metallurgy, Important Ores of Copper, Metallurgy of Copper, Physical & Chemical Properties (Action of Air, Water & Acids), Uses of Copper, Important Ores of Aluminium, Extraction of Aluminium from Alumina by Electrolytic Reduction Process, Electrolytic Refining of Aluminium, Engineering Properties of Aluminium & Uses, Properties & Applications of Semiconductors such as Silicon, Germanium, Selenium, Graphite, Silicon Carbide, Cadmium Sulphide. Alloys – Definition, Compositions, Properties & Applications of Soft Solder, Tinmann's Solder, Brazing Alloy, Plumber's Solder, Rose Metal.	08	12

05	Corrosion Definition, Types of corrosion, Atmospheric Corrosion, Mechanism, Types of oxide films, Factors Affecting Atmospheric Corrosion, Definition of Immersed Corrosion, Types of immersed corrosion, Mechanism of immersed corrosion with evolution of hydrogen and absorption of oxygen, Factors affecting immersed corrosion, Protection of Metals by Purification of Metals, Alloy Formation, Cathode Protection, Controlling the external Conditions and Application of Protective Coatings like metal coating by Galvanising, Tinning, Metal Spraying, Sherardizing, Electroplating, Metal Cladding, Cementation or Diffusion Method, their Definition, Procedure, Advantages and Disadvantages, Application. Example of Non Corrosive Materials. Protection of Corrosion by the application of Organic Coating Like Paint, Lacquer, Enamels, Emulsion Paints, Special Paints, their Properties & Uses. Special Paints – Heat Resistant, Cellulose Paint, Coaltar Paint, Antifouling Paint their constituents & applications.	08	12
Total		32	50

Practical:

Skills to be developed:

Intellectual Skills:

1. Select proper equipment and instruments
2. Interpret results

Motor Skills:

1. Accuracy in measurement
2. Careful use of equipment

List of Practical:

01	To know your chemistry laboratory.
02	To verify Faraday's Second Law of electrolysis.
03	To determine neutralization point of acetic acid (weak acid) and ammonium hydroxide (weak base). To calculate normality and strength of acetic acid.
04	To determine the equivalent point of precipitation titration of BaCl_2 with H_2SO_4 using conductivity meter. To find the normality and strength of BaCl_2 solution.
05	To find the strength in grams per litre of the given electrolyte solution (NaOH) with the help of standard oxalic acid.
06	To determine pH value of given solutions by using pH paper, universal indicator and pH meter.
07	To determine the strength of given hydrochloric acid solution by titrating it against sodium hydroxide solution using pH meter.
08	To determine percentage of copper from brass iodometrically.
09	To determine thinner content in oil paint.

10	To measure the voltage developed due to chemical reactions by setting up a Daniel Cell.
11	To determine acid value of a plastic material by using KOH/NaOH solution.
12	To prepare urea formaldehyde resin and understand the structure and properties for its applications in engineering.
	Laboratory Base Mini project.
13.	To learn etching process of PCB's (printed circuit boards) in chemistry laboratory.
14	To observe the process of corrosion of given Aluminium strip in acidic and basic medium and find relation between decrease in weight due to corrosion.

Learning Resources:**Books:**

Sr. No.	Author	Name of the book	Publisher
01	Jain & Jain	Engineering Chemistry	Dhanpat Rai and Sons
02	S. S. Dara	Engineering Chemistry	S. Chand Publication
03	B. K. Sharma	Industrial Chemistry	Goel Publication
04	S. S. Dara	Environmental Chemistry & Pollution Control	S. Chand Publication
05	Vedprakash Mehta	Polytechnic Chemistry	Jain brothers

Course Name : Electronics Engineering Group.

Course Code : DE/ED/EI/EJ/EN/ET/EV/EX/IC/IE/IS/IU/MU/IL

Semester : Second

Subject Title : Electronic Components And Applications

Subject Code : 12031

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	--	02	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)

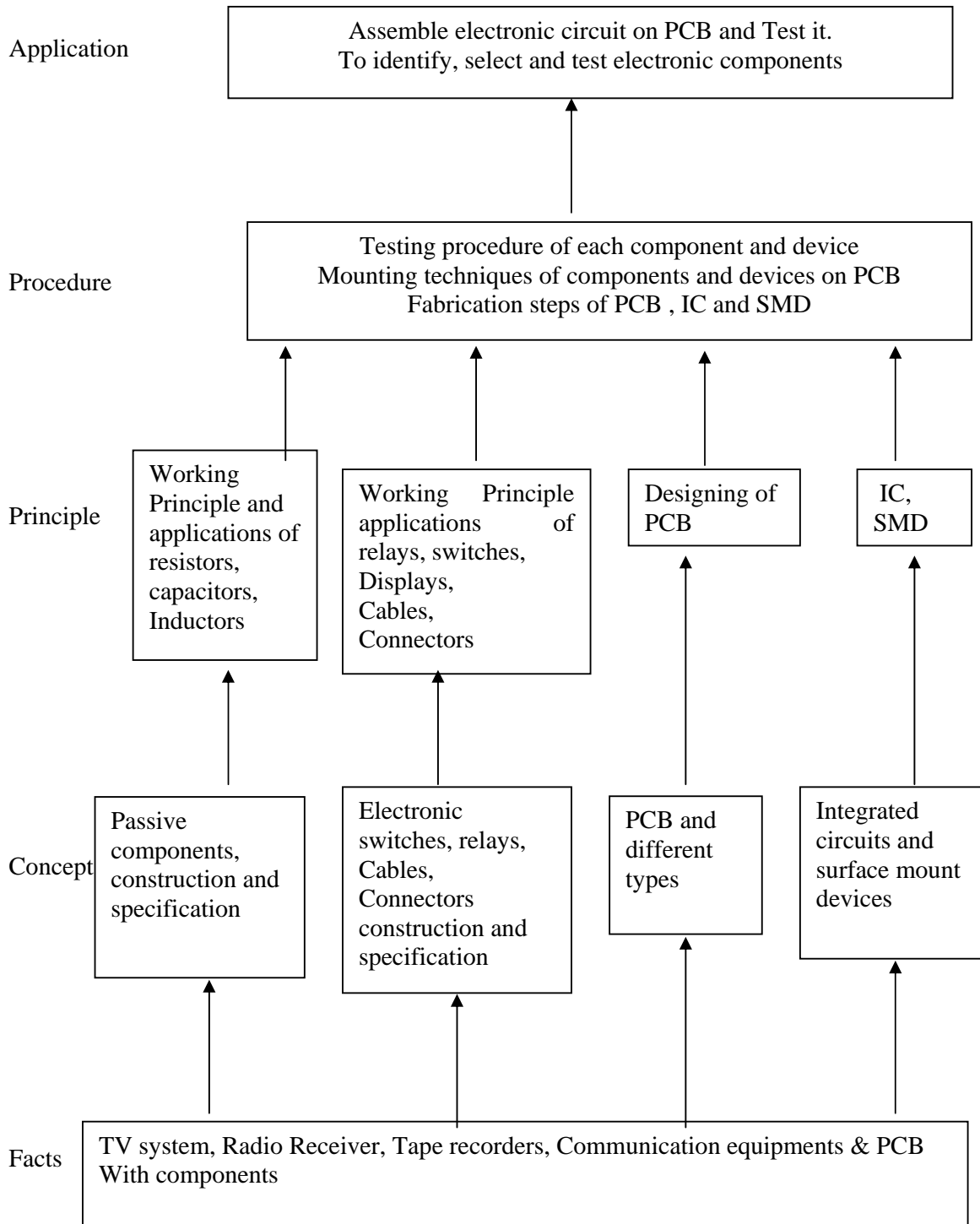
Rationale:

Material science plays vital role in Technology. Due to rapid up gradation and modification in the use of electronic components, every engineer should have the knowledge of components. This subject gives clear idea of all fundamentals of electronic components and their practical applications. This subject includes method of fabrication, working, testing, characteristics, specifications, assembling, designing, And fault finding. In industrial applications, students will be able to understand and visualize other electronic circuits and devices.

Objectives:

Students should be able to

1. Recognize the component & type of component.
2. Recognize the material used for the construction of component.
3. Understand the construction, working principle of the component.
4. Understand the specification of the component.
5. Identify the electronic components used in Household appliances, communication kits, electrical appliances.
6. Testing of components.
7. Recognize the IC, packaging type of IC,& device depending upon series letter(L,LS,LM).
8. Draw the layout of electronic circuits
9. Fault finding & troubleshooting of electronic circuits
- 10.Design the PCB & test the PCB
- 11.Reading of datasheets and interpreting the values.

Learning Structure:

Contents: Theory

Chapter	Topic	Hours	Marks
01	Resistors And Capacitors	16	24
	1.1 1.1 Resistors Marks 12 <ul style="list-style-type: none"> • Components-discrete, nondiscrete, Active, passive, parasitic components. Concept of Resistors, classification of resistors, Materials used for resistors • Resistors general specification: - maximum voltage rating, power rating, temperature coefficient, tolerance, Ohmic range, operating temperature • Construction, specification and application of Carbon film resistors, standard Wirewound resistors • Colour Coding with three, four and five bands, Color bands with characters, • Equivalent circuit of resistors • construction, working, application and characteristic curves of LDR, Rheostat, characteristics curves, application, types of TDR • Concept of linear & logarithmic potentiometer, Comparison between Linear and Logarithmic Potentiometer, Construction, specification, application of Linear Potentiometer-carbon, standard wirewound potentiometer, trimmer • Difference between potentiometer and trimmer 		
	1.2 Capacitors Marks 12 <ul style="list-style-type: none"> • Classification of capacitors, Materials used for capacitors, dielectric materials. • Capacitors specification:-capacitor working voltage, Insulation resistance, c/v ratio, power factor, capacitance frequency characteristics, E.S.R. • Fixed Capacitor- construction, specification ,application of Disc Ceramic capacitor, • Aluminium electrolytic capacitor -plain & etched foil • Variable capacitor-Requirements of variable condenser Construction, working, specification ,application of Air Gang ,PVC gang capacitor, Trimmer capacitor – mica • Coding of capacitors-using numerals, color band system, directly printed on capacitors, • Equivalent circuit of capacitors 		

2	<p>Inductors and Cable Connectors</p> <p>2.1 Inductors Marks 8</p> <ul style="list-style-type: none"> • Introduction to Magnetic Materials-ferromagnetic and ferrimagnetic, B-H curve, Hard & soft Magnetic Materials, Concepts of Hysteresis, permeability, coercivity, reluctance, Losses of magnetic materials • Faradays laws of Electromagnetic Induction, Self & mutual induced emf • Inductor Specifications- Definitions and expressions of :- self inductance, mutual inductance, coefficient of coupling, operation at low & high frequency, Q factor, Inductive Reactance. • Construction and application of Air core, iron core, ferrite core inductor, frequency range Inductors-A.F., R.F., I.F., toroidal Inductor • Construction, working, application of Slug tuned Inductor. • Color coding of Inductor using color band system. Equivalent circuit of Inductor. <p>2.2 Cables Marks 6</p> <ul style="list-style-type: none"> • General specifications of cables- characteristic impedance, current carrying capacity, flexibility. • Types of cables- construction and applications of coaxial cable, 600 E telephone cable-PASP, Alkathene sheathed cable, FRC cable, Twin core cable-Twisted & Shielded type, optical Fiber Cable. <p>2.3 Connectors Marks 6</p> <ul style="list-style-type: none"> • General specifications of connectors- contact resistance, breakdown voltage, insulation resistance • Constructional diagram, applications of BNC, D series, Audio, Video, printer, edge, FRC, RJ 45 connectors. • Constructional diagram and applications of Phone Plug & Jacks 	12	20
03	<p>Switches, Relays And Displays</p> <p>3.1 Switches Marks 8</p> <ul style="list-style-type: none"> • Switch Specifications – voltage rating, contact current rating, contact resistance, life. • Characteristics of switch & relay - operating time, release time, bounce time, electrical life, mechanical life • Constructional diagram, application of Toggle, Rotary, push to on & push to off, Rocker switch, slide switch, thumbwheel switch <p>3.2 Relays Marks 4</p> <ul style="list-style-type: none"> • NO,NC contact, construction, working and application of General purpose relay, dry reed • Difference between switch & relay 	12	20

	3.3 Displays Types of displays: LED, LCD <ul style="list-style-type: none"> LED construction, operation & application of Bicolor LED, seven segment display, common cathode & common anode display, Dot matrix array, sixteen, fourteen segment display Construction, operation & application of liquid crystal display, dynamic scattering /Refractive LCD 		
04	Integrated Circuit and Surface Mount Devices 4.1 IC Marks 10 <ul style="list-style-type: none"> IC ,Advantages ,Disadvantages of IC's, classification of IC's, What is Monolithic IC, thick & thin film IC, Hybrid IC, Linear IC, Digital IC Difference between Monolithic & Hybrid, Linear & Digital ,Thick & thin film IC Thin film technology, thick film technology, IC packages-SIP,TO 5 ,Flat , DIP, Pin Identification, Temperature ranges, Device Identification 4.2 SMD Marks 6 <ul style="list-style-type: none"> Concept of SMT & SMD, Advantages & Disadvantages of SMD what is SMD resistor ,capacitor, IC, Transistor land Pattern of SMD resistor, capacitor, Transistor &IC's SMD packages (SOT,PLCC) 	10	16
05	Printed Circuit Board <ul style="list-style-type: none"> Introduction to PCB ,Advantages, disadvantages of PCB, Types of PCB Base & Conducting material, types of laminates, Properties of copper clad laminate, Flowchart for preparation of PCB. Layout Design, Artwork rules ,Screen printing ,photo printing method Drilling, Mounting of components Soldering technique: Methods of soldering, Dip, wave, and Hand soldering, Necessary conditions for soldering Hard & soft solder, soldering alloys, fluxes, Soldering defects , Final protection, Safety, health & Medical aspects of soldering Layout of CE amplifier, half wave ,full wave rectifier 	14	20
Total		64	100

Practical:

Intellectual Skills:

1. Reading
2. Sourcing of Web sites

Motor Skill:

1. Testing
2. Measurement

List of Practical:

1. Know your laboratory
2. To identify and test fixed (Non variable) and Variable Resistors.
3. To identify and test fixed (Non variable) and Variable Capacitors.
4. To identify and test inductors.
5. To identify and test Switches.
6. To identify and test Relays.
7. To identify types of cables and connectors.
8. Identification and soldering of surface mounted devices.
9. To identify and test IC.
10. To study design rules for fabrication of PCB and identify types of PCB.
11. Mini project and troubleshooting of the circuit.
12. Visit to any PCB manufacturing Industry and prepare visit report.

Learning Resources:**1. Books:**

Sr. No	Author	Title	Publisher
1	Dhir	Electronic Components and Materials	Tata McGraw Hill
2	Madhuri Joshi	Electronic Components and Materials	Shroff Publishers & Distributors private ltd.
3	Grover & Jamwal	Electronic Components and Materials	Dhanpat Rai & Sons,
4	Walter C.Bosshart	Printed Circuit Boards	Tata McGraw Hill
5	Williams	Build your own printed circuit board with CD	Tata McGraw-Hill
6	Thomas H.Jones	Electronic Components Handbook	Reston Publishing Company
7	Harper (Charles A.)	Handbook of components for electronics	Laxmi Enterprises, Bombay

Note: Sr.No. 3 to 7 are the reference books.

Course Name : Electronics Engineering Group

Course Code : DE/ED/EI/EJ/EN/ET/EV/EX/IC/IE/IS/IU/MU

Semester : Second

Subject Title : Electronics Engineering Workshop

Subject Code : 12032

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	04	--	--	--	--	50 @	50

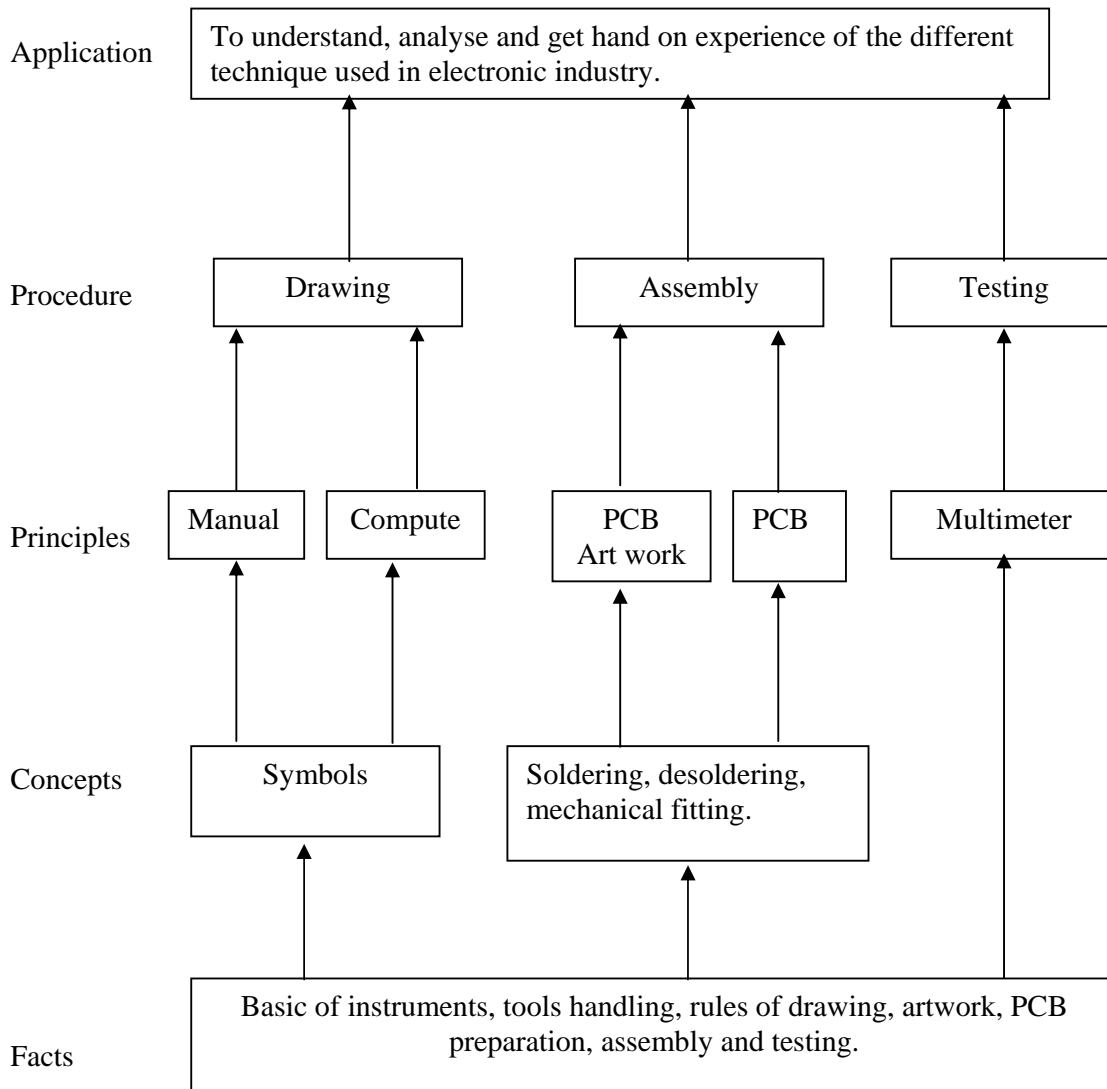
Rational:

This subject will develop practical skills in handling various mechanical, electrical and electronics tools and instruments. It helps to understand the basic skills and sequence of procedure to produce electronic goods. Use computer software developed soft skills which is really the need for the future. The basic skills of assembly, testing and trouble shooting, helps to understand the electronic equipments.

Objective:

The student will be able to:

- i) To develop the testing knowledge of computer and use of computer. Computer software to draw the circuits
- ii) Effective use of instruments in daily practice.
- iii) Analysis Technique, testing and assembly of electronic circuit build Confidence for handling instruments, tools analysis circuit.

Learning Structure:**Practical:**

Sills to be Developed:

Intellectual Skills:

1. Interpret circuit diagrams
2. Design of Printed circuit boards
3. Follow standard test procedure

Motor Skills:

1. Draw circuit diagrams
2. Preparation of layout of PCB
3. Measure different parameters accurately

List of Practical:

1. Drawing of symbols / conventions used in computers, electronic, electrical and mechanical Engineering.
2. Drawing front panel of CRO.
3. Drawing front panel of Function Generator
4. Drawing front panel of Analog Multimeter
5. Drawing front panel of Digital Multimeter
6. Drawing of circuit diagram of simple regulated power supply using 78xx & 79xx.
7. Drawing of circuit diagram of single-stage amplifier.
8. Introduction to electronic drawing software C like Eagle.
9. Practicing of electronic drawing software on C like Eagle.
10. Drawing of circuit diagram of regulated power supply using software (same circuit used in expt. No 06.)
11. Drawing circuit diagram of single-stage amplifier using software.
12. Drawing Block diagram minimum system using microcontroller by software.
13. Drawing of Power supply box using software. (Same box used in basic workshop practice metal box).
14. To study PCB artwork rules.
15. Prepare PCB artwork for regulated power supply on graph paper.
16. Introduction to PCB artwork software C eagle.
17. Prepare PCB artwork for regulated power supply using software. (for circuit used in Expt. No6.)
18. Prepare negative film (For artwork prepare in Expt no 17).
19. Prepare P.C.B. for regulated power supply (size of PCB such that it can be fitted in metal box prepared in basic workshop practice).
20. Testing of PCB.
21. Testing of resistors, capacitors, inductors and transformer using analog Multimeter.
22. Testing of resistors, capacitors, inductors and transformer using digital Multimeter.
22. Measurement of DC, AC voltage and current using analog Multimeter.
23. Measurement of DC, Ac voltage and current using digital Multimeter.
24. Testing of diode, Transistor, FET, MOSFET, Photo devices using Multimeter.
25. Assembly of electrical extension board (Extension board used which is prepared in basic workshop)
26. Fitting of regulated power supply using in metal box.
27. Collect the catalog from market/internet for instruments, tools required for electronic workshop and write down the specification, cost and name of the manufacturer with the help of catalogs.

Course Name : All Branches of Diploma in Engineering and Technology

**Course Code : AE/CD/CE/CH/CM/CO/CR/CS/CV/DE/ED/EE/EI/EJ/EN/EP/ET/EV/
EX/FE/IC/IE/IF/IS/IU/ME/MH/MI/MU/PG/PS/PT/AA/DC/PN/SC/TC/TR/TX**

Semester : SECOND

Subject Title : Development of Life Skills-I

Subject Code : 12018

TEACHING AND EXAMINATION SCHEME:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	--	--	--	25#	25@	50

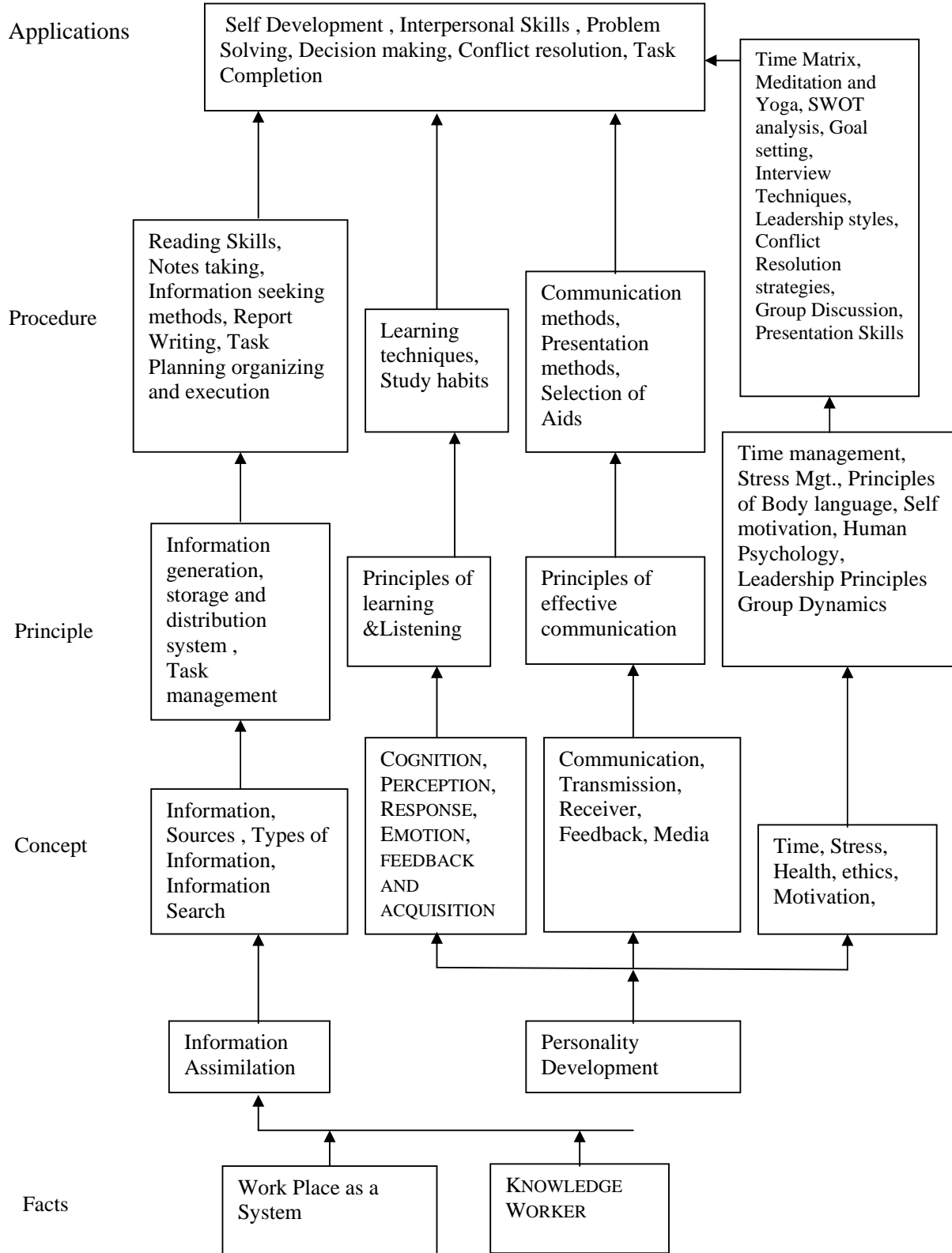
Rationale:

In today's competitive world, the nature of organizations is changing at very rapid speed. 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.

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. Such skills will enhance his capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems. The Subject Is Classified Under Human Science.

Objectives: The students will be able to:

1. Develop reading skills
2. Use techniques of acquisition of information from various sources
3. Draw the notes from the text for better learning.
4. Apply the techniques of enhancing the memory power.
5. Develop assertive skills.
6. Prepare report on industrial visit.
7. Apply techniques of effective time management.
8. Set the goal for personal development.
9. Enhance creativity skills.
10. Develop good habits to overcome stress.
11. Face problems with confidence.

LEARNING STRUCTURE:

Contents: Theory

Topic No	Contents	Hours
1	Importance of DGS, Introduction to subject, importance in present context ,application	01
2	Information Search Information source –Primary, secondary, tertiary Print and non - print, documentary, Electronic Information center, Library, exhibition, Government Departments. Internet Information search – Process of searching, collection of data -questionnaire, taking Interview, observation method.	02
3	Written communication METHOD OF NOTE TAKING Report writing –Concept, types and format.	01
4	Self Analysis Understanding self- Attitude, aptitude, assertiveness, self esteem, Confidence buildings. Concept of motivation.	02
5	Self Development Stress Management –Concept, causes, effects , remedies to void/minimize stress. Health Management – Importance, dietary guidelines and exercises. Time management- Importance, Process of time planning, Urgent Vs importance, Factors leading to time loss and ways to handle it ,Tips for effective time management. EMOTION-CONCEPT, TYPES, CONTROLLING, EMOTIONAL INTELLIGENCE. CREATIVITY-CONCEPT, FACTORS ENHANCING CREATIVITY. GOAL SETTING – CONCEPT, SETTING SMART GOAL.	07
6	Study habits Ways to enhance memory and concentration. Developing reading skill. Organisation of knowledge, Model and methods of learning.	03
Total		16

LIST OF ASSIGNMENTS:**The Term Work Will Consist Of Following Assignments.**

- 1) Self Awareness.
- 2) Techniques of developing positive attitude.
- 3) Learning, Memory and Concentration.
- 4) To understand the concept of study techniques and participate in a panel discussion on it.
- 5) To understand the concept of motivation and emotional intelligence.
- 6) Goal Setting.
- 7) Information search in library.
- 8) Information search through internet.
- 9) Time Management.
- 10) Health and stress Management
- 11) Assertiveness and confidence building
- 12) Creativity

NOTE:- THESE ARE THE SUGGESTED ASSIGNMENT FOR GUIDE LINES TO THE SUBJECT TEACHER. HOWEVER THE SUBJECT TEACHERS CAN SELECT, DESIGN ANY ASSIGNMENT RELEVANT TO THE TOPIC, KEEPING IN MIND THE OBJECTIVES OF THIS SUBJECT.

Learning Resources:

Books:

Sr. No	Author	Title of the book	Publisher
1	Marshall Cooks	Adams Time management	Viva Books
2	E.H. Mc Grath , S.J.	Basic Managerial Skills for All	Pretice Hall of India, Pvt Ltd
3	Allen Pease	Body Language	Sudha Publications Pvt. Ltd.
4	Lowe and Phil	Creativity and problem solving	Kogan Page (I) P Ltd
5	Adair, J	Decision making & Problem Solving	Orient Longman
6	Bishop , Sue	Develop Your Assertiveness	Kogan Page India
7	Marion E Haynes	Make Every Minute Count	Kogan page India
8	Pearson Education Asia	Organizational Behavior	Tata McGraw Hill
9	Michael Hatton (Canada – India Project)	Presentation Skills	ISTE New Delhi
10	--	Stress Management Through Yoga and Meditation	Sterling Publisher Pvt Ltd.
11	Richard Hale ,Peter Whilom	Target setting and Goal Achievement	Kogan page India
11	Chakravarty, Ajanta	Time management	Rupa and Company
12	Harding ham .A	Working in Teams	Orient Longman

Internet Assistance:

- 1) <http://www.mindtools.com>
- 2) <http://www.stress.org>
- 3) <http://www.ethics.com>
- 4) <http://www.coopcomm.org/workbook.htm>
- 5) <http://www.mapfornonprofits.org/>
- 6) <http://www.learningmeditation.com> <http://bbc.co.uk/learning/courses/>
- 7) <http://eqi.org/>
- 8) <http://www.abacon.com/commstudies/interpersonal/indisclosure.html>
- 9) <http://www.mapnp.org/library/ethics/ethxgde.htm>
- 10) http://www.mapnp.org/library/grp_cnfl/grp_cnfl.htm
- 11) <http://members.aol.com/nonverbal2/diction1.htm>
- 12) http://www.thomasarmstron.com/multiple_intelligences.htm
- 13) <http://snow.utoronto.ca/Learn2/modules.html>
- 14) <http://www.quickmba.com/strategy/swot/>

Course Name : Electronics Engineering Group

Course Code : DE/ED/EI/EJ/EN/ET/EV/EX/IC/IE/IS/TU/MU

Semester : Second

Subject Title : Professional Practices II

Subject Code : 12033

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	02	--	--	--	--	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.

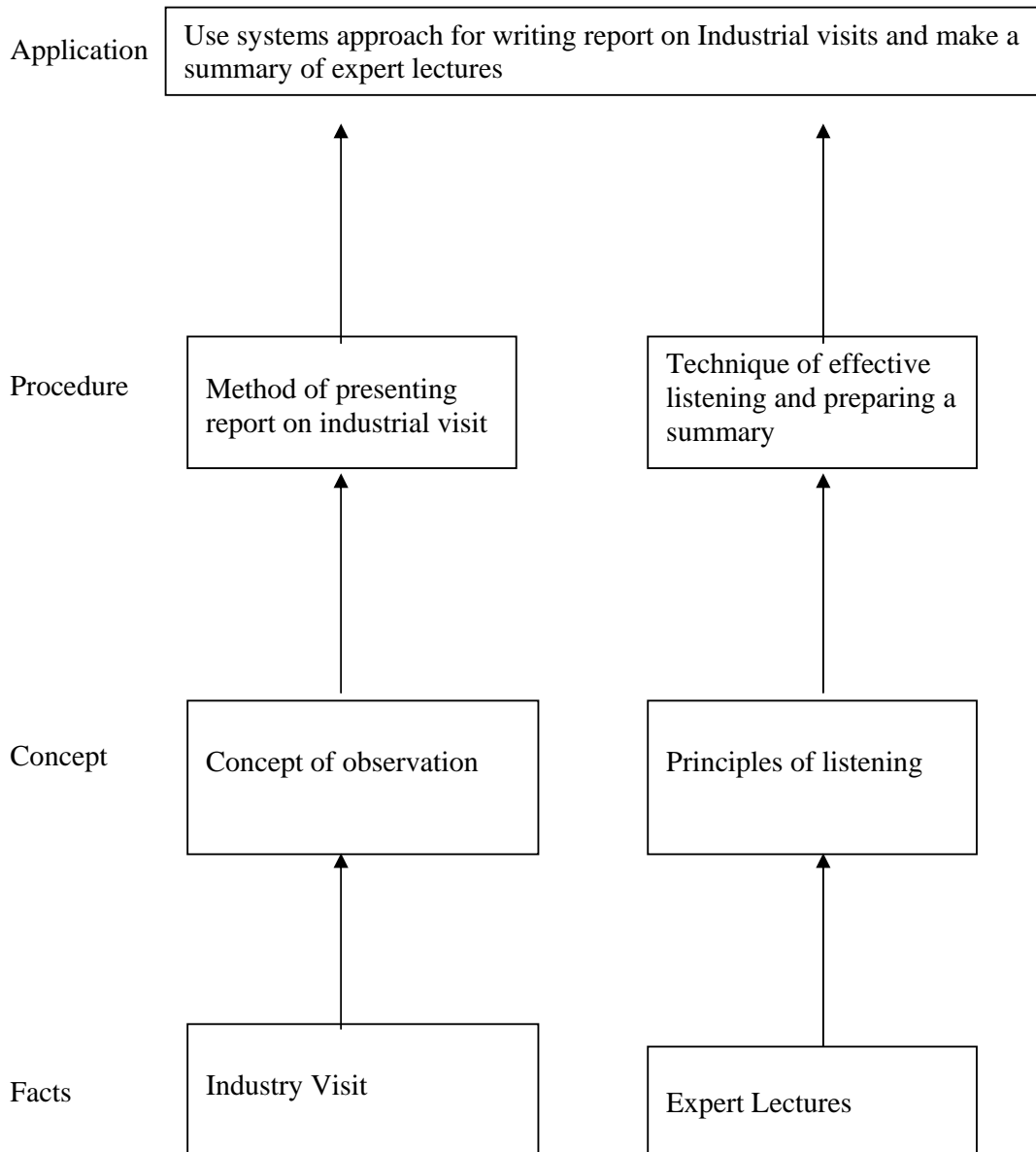
While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

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

Objectives:

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:

Sr. No.	Activity	Hours
01	Industrial Visits: Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form part of the term work. Visits to any two of the following : i) Capacitor, Inductor, Resister, Transformer Manufacturing Small Scale Unit ii) Petrol Pump iii) PCB Manufacturing Unit iv) ATM Centre – Bank transactions v) Domestic Appliances repair centre	14
02	Lectures by Professional / Industrial Expert to be organized on any three topics of the following suggested areas or any other suitable topics: i) Pollution control. ii) Fire hazards and Safety Norms iii) Fire Fighting / Safety Precautions and First aids. iv) Rain Water Harvesting v) Topics related to Social Awareness such as –Traffic Control System, Career opportunities , Communication in Industry, Yoga Meditation, Aids awareness and health awareness	10
03	Group Discussion : The students should discuss in group of six to eight students and write a brief report on the same as part of term work. The topic for group discussions may be selected by the faculty members. Some of the suggested topics are - i) Sports and Cultural Activities ii) Discipline and House Keeping iii) Current topic related to Electronics Engineering field.	08
Total		32