 MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES																	
COURSE NAME : CIVIL ENGINEERING GROUP																	
COURSE CODE : CE/CS/CR/CV																	
DURATION OF COURSE : 6 SEMESTERS for CE/CS/CR (8 SEMESTERS for CV)												WITH EFFECT FROM 2009-10					
SEMESTER : SECOND												DURATION : 16 WEEKS					
PATTERN : FULL TIME - SEMESTER												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)			
								Max	Min	Max	Min	Max	Min	Max	Min		
1	Communication Skills	CMS	12012	02	--	02	03	100	40	--	--	25#	10	25@	10	50	
2	Engineering Mathematics	EMS	12013	03	01	--	03	100	40	--	--	--	--	--	--		
3	Applied Science (CIVIL)	ASC	12020	04	--	04	03	100	40	50@	20	--	--	--	--		
4	Engineering Mechanics	EGM	12015	03	--	02	03	100	40	--	--	--	--	25@	10		
5	Workshop Practice	WPC	12017	--	--	04	--	--	--	--	--	--	--	50@	20		
6	Development of Life Skills-I	DLS	12018	01	--	02	--	--	--	--	--	25#	10	25@	10		
7	Professional Practices-II	PPS	12705	--	--	02	--	--	--	--	--	--	--	50@	20		
Total				13	01	16	--	400	--	50	--	50	--	175	--	50	
<p>Student Contact Hours Per Week: 30 Hrs. THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH. Total Marks : 725 @ Internal Assessment, # External Assessment, No Theory Examination.</p> <p>Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, ,OR-Oral, TW- Termwork, SW- Sessional Work</p> <ul style="list-style-type: none"> ➤ 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 : CE/CR/CS/ME/EE/EP/EJ/EN/ET/EX/DE/IE/IS/IC/EV/MU/CO/CM/
IF/CV/MH/FE/IU/CD/ED/EI**

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:

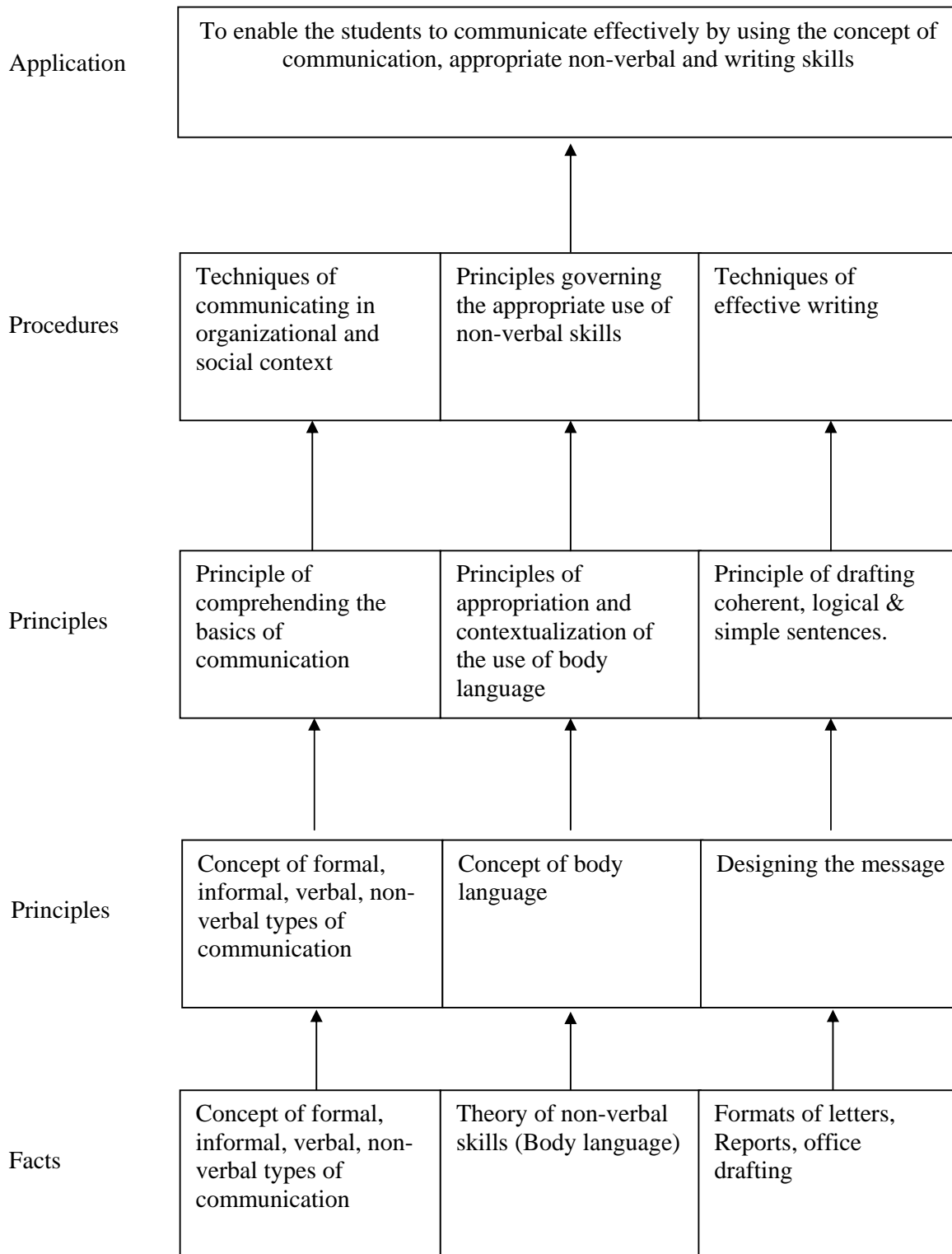
The Students have been already been exposed to the Language Skills pertaining to English, leading to a better understanding of English & use of grammar, developing a base for the language. Now with a view to achieve some mastery over the language & to develop Communication Skills, which is the main objective 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:



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 appropriate 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 : CE/ME/IE/EJ/DE/ET/EX/EE/EP/MU/EV/IS/CO/CM/IF/PG/PT/AE/
CV/MH/FE/CD/ED/EI**

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	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
	Applications Of Derivative 4.1.1 Geometrical meaning of Derivative, 4.1.2 Maxima and minima 4.1.3 Radius of Curvature		
4	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 : Civil Engineering Group

Course Code : CE/CS/CR/CV

Semester : Second

Subject Title : Applied Science (CIVIL)

Subject Code : 12020

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

2. 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 (12020)

Rationale:

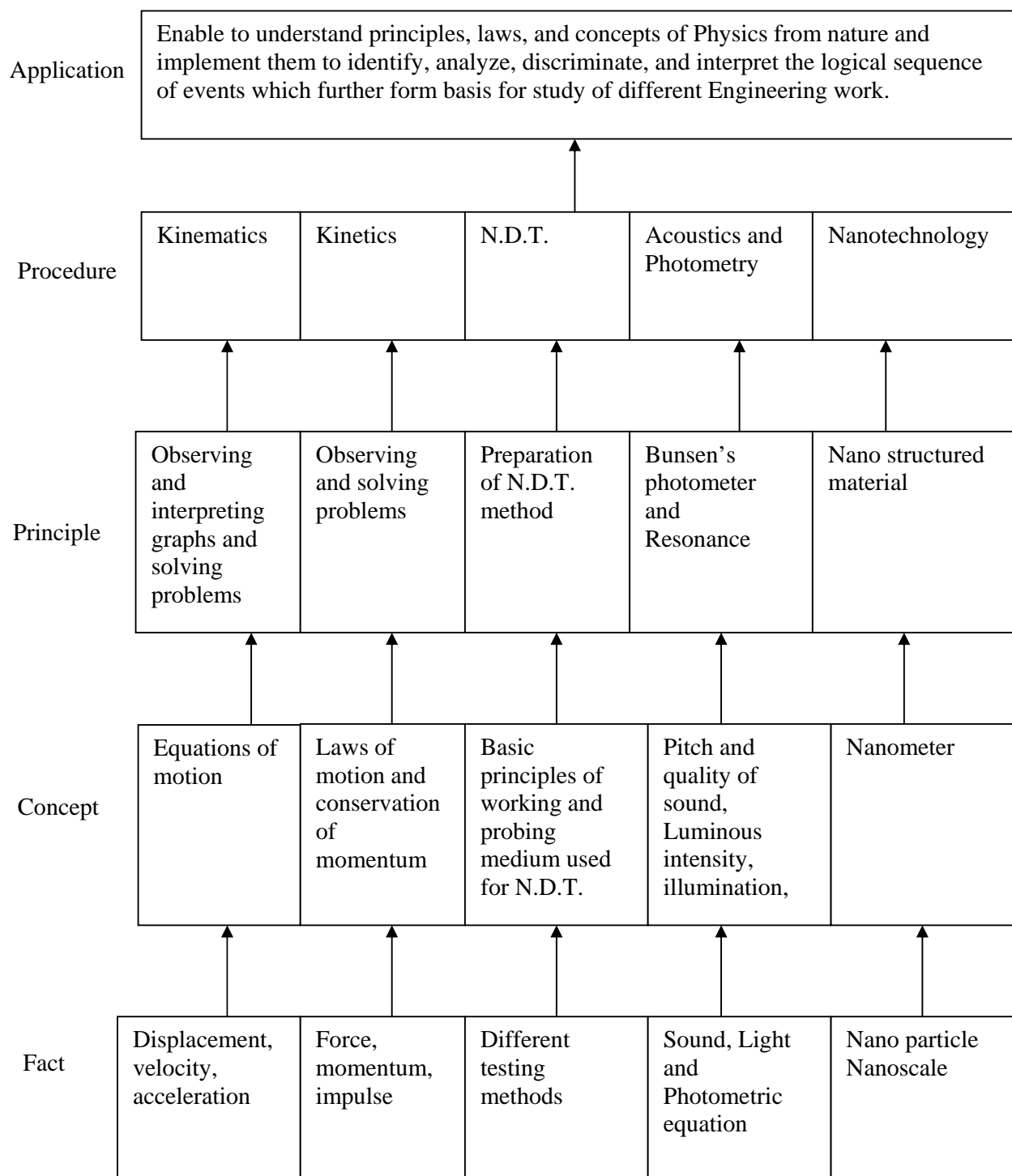
Physics provides foundation for core technology subjects. Understanding of any subject is entirely depending on logical thinking and hierarchy of knowledge component. As Physics is considered as basic science its principles, laws, hypothesis, concepts, ideas are playing important role in reinforcing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

In correlation with above cited thought teacher should put deliberate efforts to procure the focus of the subject so that tertiary level will be covering both science and technology. This will be gateway for development of reasoning capacity of student and understanding of new technology as well.

Objectives: The Student will be able to:

1. Differentiate kinetic and kinematics and solve the problems on kinematics and kinetics.
2. Graphically represent rectilinear motion, S.H.M. and use for solving engineering problems.
3. Use N.D.T. in quality assurance and saving of man power, machining, materials,
4. Use principles of illumination for enhancing work efficiency
5. Analyze variation of sound intensity with respect to distance.
6. Identify different factors affecting acoustical planning of buildings
7. Identify different factors affecting indoor lighting.

Learning Structure:

Contents: Theory

Chapter	Name of The Topic	Hours	Marks
01	1. Kinematics 1.1 Rectilinear Motion Equations of Motions- $v=u+at$, $s=ut+\frac{1}{2}at^2$, $V^2=u^2+2as$ (no derivation.), Distance traveled by particle in n^{th} second, Velocity Time Diagrams-uniform velocity, uniform acceleration and uniform retardation, equations of motion for motion under gravity. [Numericals on equations of motion, V-T diagram, motion under gravity]	05	06
	1.2 Angular Motion Definition of angular displacement, angular velocity, angular acceleration, Relation between angular velocity and linear velocity, Definition of S.H.M. and S.H.M. as projection of uniform circular motion on any one diameter, Equation of S.H.M. and Graphical representation of displacement, velocity, acceleration of particle [Numericals on ω, α and S.H.M.]	05	08
02	2. Kinetics 2.1 Definitions of momentum, impulse, impulsive force, Statements of Newton's laws of motion and with equations, Applications of laws of motion—Recoil of gun, Motion of two connected bodies by light inextensible string passing over smooth pulley, Motion of lift. [Numericals on impulse, recoil velocity and motion of lift.]	05	06
	2.2 Work ,power ,Energy Definition of work, power and energy, equations for P.E. K.E., Work energy principle, Representation of work by using graph, Work done by a torque(no derivation) [Numericals on work, potential and kinetic energy]	03	04
03	3. Non –destructive testing of Materials. Testing methods of materials -Destructive and Nondestructive, Advantages and Limitations of N.D.T., Different NDT methods used in industries, selection of NDT methods, Liquid penetrant and ultrasonic testing methods – principle, procedure and applications. [No Numericals]	06	08

04	Acoustics and Indoor Lighting of Buildings 4.1 Acoustics Acoustics –concept and definition, Intensity and loudness of sound, echo, Reverberation standard reverberation time , Sabine’s formula ,Conditions for good acoustics, Factors affecting Acoustical planning of auditorium-- reverberation time, creep, echelon effect and noise, Different ways of controlling these factors. [Numericals on Sabine’s formula]	05	08
	4.2 Indoor lighting Definition of luminous intensity, intensity of illumination with their SI units, Inverse square law of Photometric equation, Bunsen’s photometer— ray diagram, working and applications, Need of indoor lighting, Indoor lighting schemes and Factors affecting Indoor Lighting. [Numericals on inverse square law of photometry and illumination]	05	06
05	Introduction to nanotechnology Definition of nanoscale, nanometer, nanoparticle, Definition and example of nanostructured materials, applications of nanotechnology – electronics, automobiles, medical, textile, cosmetics, environmental, space and defense.	03	04
Total		32	50

Practical:**Skills to be developed:****Intellectual skills:**

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

Motor skills:

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

List of Experiment:

1. To represent simple harmonic motion with the help of vertical oscillation of spring and to determine spring constant (K) (Stiffness Constant).
2. To determine time period of oscillation of compound bar pendulum and calculate acceleration due to gravity (g).
3. To compare luminous intensities of two luminous bodies by using Bunsen’s photometer.
4. To calculate coefficient of absorption for acoustical materials.
5. To determine Joule’s constant (J) by electric method.

6. To Verify Ampere's rule using Oersted's Experiment and find variation of intensity of magnetic field with Current and Distance.
7. To determine frequency of sound by using sonometer.
8. To calculate refractive index of material of prism using spectrometer device.
9. To determine coefficient of thermal conductivity of good conductor by using Searle's method.
10. To detect surface cracks in the working piece by using liquid penetration method (LPT).
11. To determine the moments of inertia (I_{α} and I_{β}) of the given irregular body and to determine the rigidity modulus of the material of the given suspension wire by setting up a torsional pendulum.
12. To determine wavelength of Sodium light by using Newton's rings.

Learning Recourses:

Books:

Sr. No.	Author	Title	Publisher
01	V. Rajendran	Physics-I	Tata McGraw- Hill
02	Arthur Beiser	Applied physics	Tata McGraw- Hill
03	R.K.Gaur and S.L.Gupta	Engineering Physics	Dhanpatrai and Sons.
04	Rensic and Halliday	Physics	Wiley publications
04	Dr. S. K. Kulkarni	Nanotechnology-principles and practices	Capital publishing company

Part B: Applied Chemistry (12020)

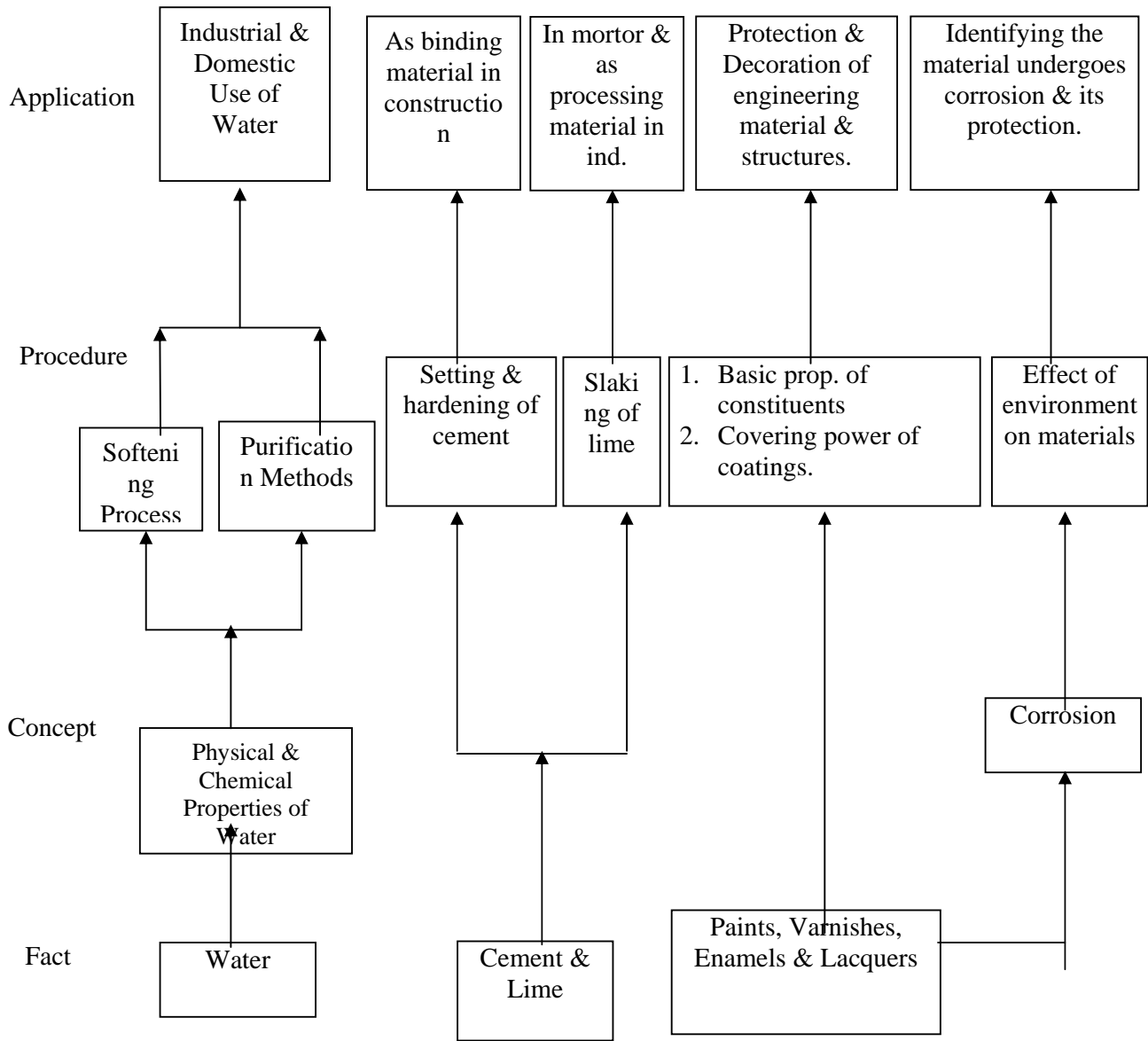
RATIONALE:

This syllabus of chemistry for civil students is classified under the category of applied science. It is intended to teach students the quality of water & its treatment as per the requirement, & selection of various construction materials & their protection by metallic & organic coatings.

OBJECTIVES:

1. Implementing the knowledge for the utilization of water resources in engineering & trouble shooting of the problems while using unsuitable water.
2. Able to select appropriate materials used in construction.
3. Apply knowledge to enhance operative life span of construction material & structure by various protective methods.

LEARNING STRUCTURE:



Contents: Theory

Chapter	Name of The Topic	Hours	Marks
01	<p>Water Characteristics, Sources, Impurities, Hard & Soft Water, Causes of Hardness, Types of Hardness, Degree of Hardness, Ill Effects of Hard Water in Industries, Domestic Field & Steam Generation, Scale & Sludge Formation – Causes, Disadvantage & Removal, Softening Methods such as Boiling, Clark's, Soda Ash, Lime Soda, Permulite Zeolite & Ion Exchange Methods with Principle Chemical Reactions, Removal of Fe, SiO₂, Dissolved Oxygen, Oil, & Algae from the Water Used in Industry, Characteristics of Potable Water – Its treatment by Screening, Sedimentation, Coagulation, Filtration, Sterilization with Principle, Process & Chemical Reactions, Plumbo solvency & its Removal Methods – pH & Its Applications in Engineering, Numericals.</p>	12	18
02	<p>Cement & Lime Cement – Definition, Types, Portland Cement, Composition, Compound Constituents, Functions of Compound Constituents, Setting & Hardening of Cement with Chemical Relaxation, Function of Gypsum in Cement, Properties of Cement Quality, Setting Time, Shrinkage, Soundness, Colour, Heat of Setting or Hardening, Strength, Corrosion by Acid, CO₂ & Sulphate, ISI Specifications of Cement, Uses of Cement, Properties & Application of Water Proofing Cement, Slag Cement, Acid Resisting Cement, Super Sulphate Cement, White & Coloured Cement, Sorel's Cement, Plaster of Paris, Mortar & Concrete, Lime – Definition, Slaking of Lime, Types, their Composition, Properties & Uses.</p>	06	12
03	<p>Paints & Varnishes Paints Definition, Characteristics of Good Paint, Constituents & their functions & Examples, Methods of Applications, Failure of Paint Film, Remedy to Prevent Failure, Classification of Paint based on Applications such as Exterior House Paint, Interior Wall Paints, Chemical Resistant Paints, Luminous Paints, Emulsion Paints, Metal Paints, Cement Paints, Water Paint or Distempers. Varnishes Definition, Characteristics, Constituents, Types, Composition, Properties & Application of Japans, Enamels, Lacquers.</p>	06	10
04	<p>Corrosion Definition, Types, Atmospheric or Chemical Corrosion, Mechanism, Factors Affecting Atmospheric Corrosion & Immersed Corrosion or Electrochemical Corrosion, Mechanism, Protection of Metals by Purification of Metals, Alloy Formation, Cathode Protection, Controlling the External</p>	08	10

	Conditions & Application of Protective Coatings like metal coating by Galvanising, Tinning, Metal Spraying, Sherardizing, Electroplating, Metal Cladding, Cementation or Diffusion Method, their Definition, Procedure, Uses, Advantages & Disadvantages, Examples of Non Corrosive Materials.		
	Total	32	50

Practical:

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:

1	To know your chemistry laboratory
2	To determine the alkalinity of given sample of water to decide the suitability of water for use in industry, steam generation, etc.
3	To determine of degree of hardness of water by EDTA method to find the suitability of water in industrial and domestic sue.
4	To determination of chloride content in the given sample of water by Mohr's method.
5	To determine pH value of given solutions by using pH paper, universal indicator and pH meter.
6	To determine the strength of given hydrochloric acid solution by titrating it against sodium hydroxide solution using pH meter.
7	To determine percentage of calcium content in cement.
8	To determination standard/normal consistency of Ordinary Portland Cement (OPC).
9.	To determine thinner content in oil paint.
Laboratory based mini projects	
10	To find out the initial setting time for Portland cement of various brands as per ISI specification.
11	To compare the quality of water from different sources by finding total dissolved matter from it and decide their significance in construction.
12	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 and time.

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 and Co.
03	B. K. Sharma	Industrial Chemistry	Goel Publication
04	S. S. Dara	Environmental Chemistry & Pollution Control	S. Chand and Co.
05	Vedprakash Mehta	Polytechnic Chemistry	Jain Brothers

Course Name : Civil, Mechanical and Electrical Group

Course Code : CE/CS/CR/ME/PT/PG/AE/EE/EP/MH/FE/CV

Semester : Second

Subject Title : Engineering Mechanics

Subject Code : 12015

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:

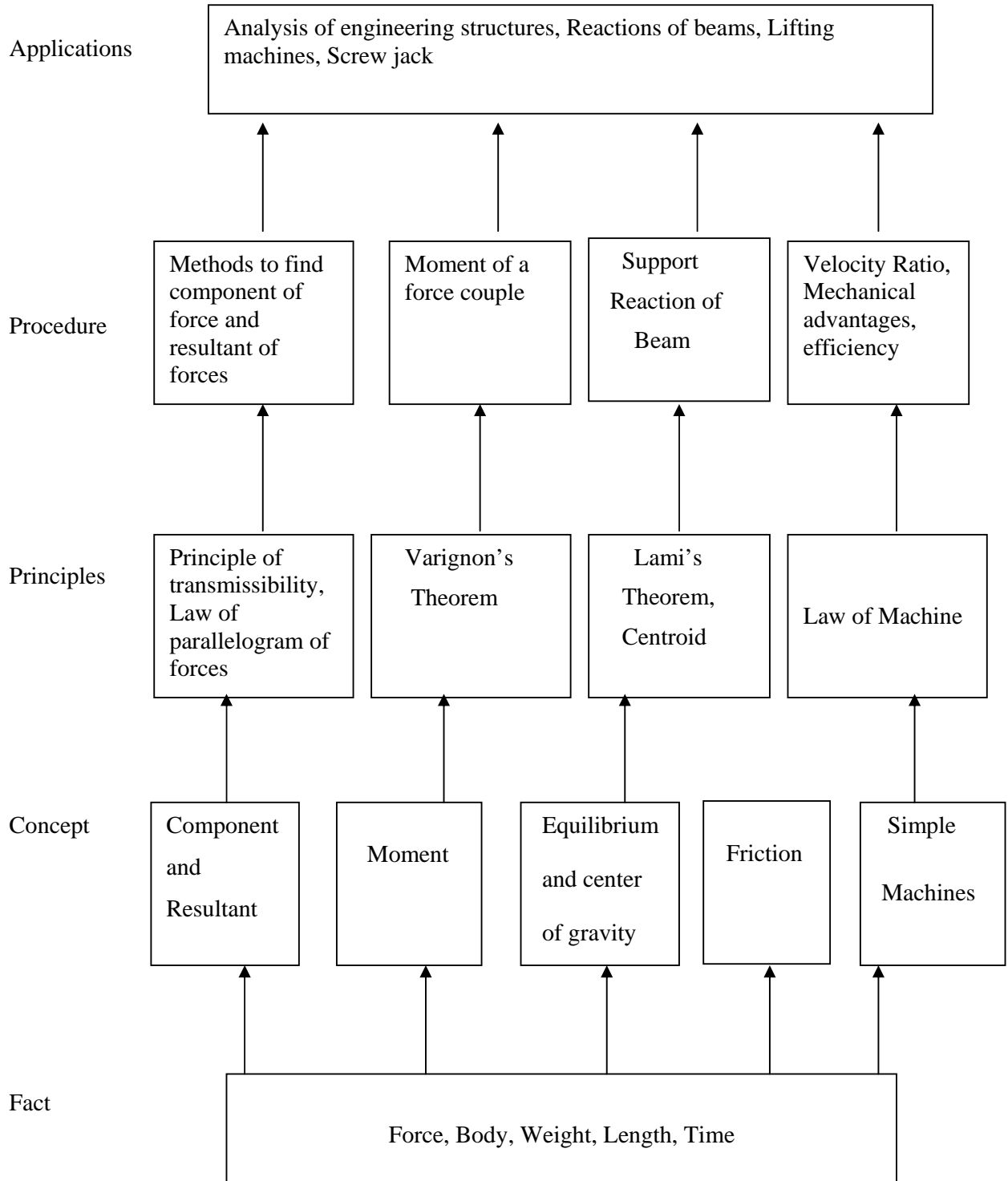
The Subject is grouped under basic engineering courses, which helps the students to understand facts, concepts, principles and techniques of scientific investigation in the field of Civil Engineering. The subject describes analysis of structure and mechanisms, principles which are commonly used in Civil Engineering Structures and also used in the machines and measuring instruments.

Objectives:

The students will able to:

1. Resolve the forces
2. Find the resultant of given force system
3. Find the reactions of beam
4. Find the center of gravity of composite solids.
5. Find M.A., V.R., Efficiency and establish law of machine

Learning Structure:



Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	<p>Force</p> <p>1.1 Fundamentals: - Definitions of mechanics, Engineering Mechanics, statics, dynamics, kinematics, kinetics, body, rigid body, mass, weight, length, time, scalar and vector, S.I. units.</p> <p>1.2 Force: - Definition of a force, S.I. unit of a force, representation of a force by vector and by Bow's notation method.</p> <p>1.3 Force system: - Definition, classification of force system according to plane and line of action Characteristics of a force, effects of a force, principle of transmissibility.</p> <p>1.4 Resolution of a force: Definition, Method of resolution, Types of Component of a force - Perpendicular component and Non-perpendicular component.</p> <p>1.5 Moment of a force: - Definition, measurement of moment of a force, S. I. Unit, geometrical meaning of moment of a force, classification of moments according to direction of rotation, sign convention, law of moments, Varignon's theorem of moment and it's use. Couple – definition, S.I. unit, measurement of a couple, properties of couple.</p> <p>1.6 Composition of Forces: - Definition, Resultant force, methods of composition of forces, I - Analytical method – (i) Trigonometric method (law of parallelogram of forces) (ii) Algebraic method (method of resolution) for calculation of resultant for all force systems. II - Graphical method: - Introduction, space diagram, vector diagram, polar diagram, and funicular polygon. Resultant of concurrent, non-concurrent and parallel force system.</p>	12	25
02	<p>Equilibrium:</p> <p>2.1 Definition, conditions of equilibrium- analytical and graphical conditions of equilibrium for concurrent, parallel force system, non-concurrent non parallel force system, free body and free body diagram.</p> <p>2.2 Lami's Theorem – statement and explanation, Application of Lami's theorem for solving various</p>	10	20

	<p>engineering problems having two unknowns only.</p> <p>2.3 Equilibrant – Definition, relation between resultant and equilibrant, equilibrant of concurrent and non-concurrent force system.</p> <p>2.4 Beams – Definition, Types of beams (cantilever, simply supported, overhanging, fixed, continuous), Types of end supports (simple support, hinged, roller, fixed), classification of loads(point load, inclined point load, uniformly distributed load), Reactions of a simply supported and over hanging beam by analytical and graphical method.</p>		
03	<p>Friction:</p> <p>3.1 Definition of friction, force of friction, limiting frictional force, coefficient of friction, angle of friction, angle of repose, relation among angle of friction, angle of repose and coefficient of friction. Cone of friction, types of friction, laws of friction, advantages and disadvantages of friction.</p> <p>3.2 Equilibrium of bodies on level plane –external force applied horizontal and inclined (Pull & Push)</p> <p>3.3 Equilibrium of bodies on inclined plane – external forces is applied parallel to the plane.</p> <p>3.4 Ladder friction.</p>	08	20
04	<p>Centroid and Centre Of Gravity:</p> <p>4.1 Centroid: Definition of centroid. moment of an area about an axis. centroid of basic geometrical figures such as square, rectangle, triangle, circle, semicircle and quarter circle. Centroid of composite geometrical figures.</p> <p>4.2 Centre of gravity: Definition, centre of gravity of simple solids such as cylinder, sphere, hemisphere, cone, cube, and rectangular block. centre of gravity of composite solids.(No hollow solids shall be considered)</p>	08	15
05	<p>Simple Machines:</p> <p>5.1 Definitions of simple machine & compound machine , load , effort , mechanical advantage , velocity ratio , input of a machine ,output of a machine ,efficiency of a machine , relation among</p>	10	20

	<p>mechanical advantage , velocity ratio and efficiency of a machine. Ideal machine, ideal effort and ideal load, friction in machines, effort lost in friction and load lost in friction.</p> <p>5.2 Law of machine, maximum mechanical advantage and maximum efficiency of a machine, reversibility of a machine, condition for reversibility of a machine (no derivation) and self-locking machine.</p> <p>5.3 Study of simple machines: Simple axle and wheel, differential axle and wheel, Weston's differential pulley block, single purchase crab, double purchase crab, worm and worm wheel, geared pulley block, screw jack, Two sheave & Three sheave pulley block.</p>		
	Total	48	100

Practical:

Skills to be developed:

Intellectual Skill:

1. Calculate the forces on given structure
2. Interpret the results

Motor Skills:

1. Handle the equipment carefully
2. Draw graph

The term work consists of any five experiments from Group A & any three experiments from group B and graphical solution of Group C.

Group A:

- 1) To verify law of polygon of forces.
- 2) To verify law of moments.
- 3) To verification of Lami's theorem.
- 4) To determine the forces in members of a jib crane.
- 5) Comparison of coefficient of friction of various pair of surfaces and determination of angle of repose.
- 6) To verify equilibrium of parallel forces – simply supported beam reactions.
- 7) Experimental location of center of gravity of plane plate of uniform thickness.

Group B: To find MA, VR, Efficiency, Ideal Effort, Effort lost in friction for various loads and establish law of machine and calculate maximum efficiency.

Also check the reversibility of a machine

- 1) Worm and worm wheel or Differential axle and wheel
- 2) Weston's differential pulley block or Geared pulley block
- 3) Single purchase crab or Double purchase crab
- 4) Simple screw jack.
- 5) Two sheave and three sheave pulley block

Group C: Graphical solutions on graph paper of the following:

- 1) Concurrent force system :Two problems
- 2) Parallel force system :Two problems
- 3) Reactions of a beam having vertical point loads & UDL :Two problems

Learning Resources:

Books:

Sr. No.	Author	Title	Publisher
01	Beer – Johnson	Engineering Mechanics	Tata McGraw Hill, Delhi
02	Basu	Engineering Mechanics	Tata McGraw Hill, Delhi
03	R. S. Khurmi	Applied Mechanics	Dhanpat Rai & sons, Delhi
04	Dhade, Jamdar & Walawalkar	Fundamental of Applied Mechanics	Pune Vidhyarthi Gruh Prakashion, Pune

Course Name : Civil Engineering Group

Course Code : CE/CS/CR/CV

Semester : Second

Subject Title : Workshop Practice

Subject Code : 12017

Teaching and Examination Scheme:

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

- Notes: 1] The instructor shall give demonstration to the students by preparing a specimen job as per the job drawing.
2] The workshop diary shall be maintained by each student duly signed by instructor of respective shop

Rationale:

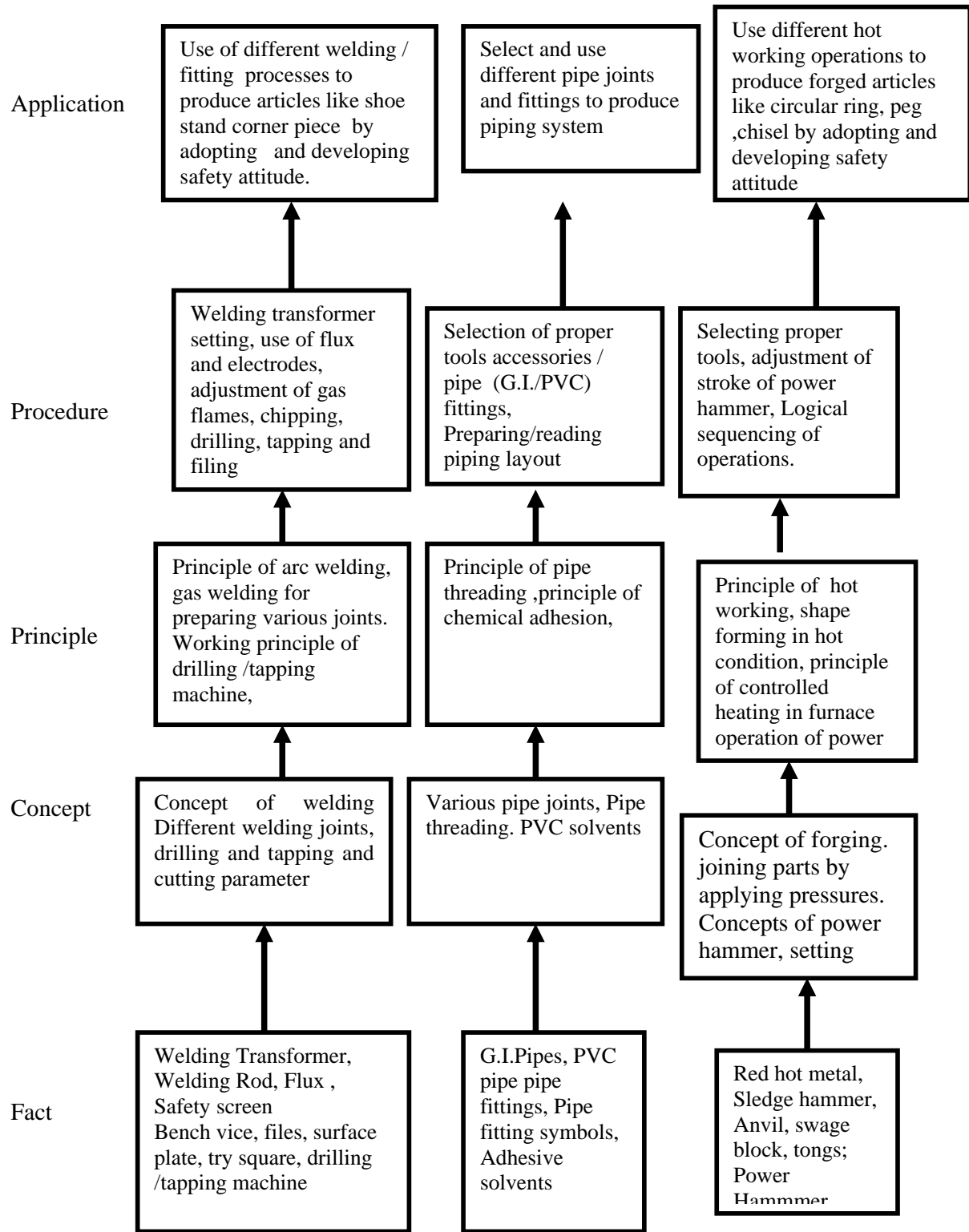
Civil diploma technician is expected to know basic workshop practice like, Gas Welding gas cutting. Fitting, Drilling, Tapping, plumbing and hot working processes. The students are required to identify operate and control various machines. The students are required to select and use various tools and equipments for welding, fitting, tapping drilling, plumbing and forging operations.

Objectives:

The student will able to:

- Know basic workshop processes.
- Read and interpret job drawings.
- Identify, select and use various marking, measuring, and holding, striking and cutting tools & equipments wood working and sheet metal shops.
- Operate, control different machines and equipments.
- Select proper welding rods and fluxes.
- Inspect the job for specified dimensions
- Produce jobs as per specified dimensions.
- Adopt safety practices while working on various machines.

Learning Structure:



Practical:**Skill to be developed:**

Intellectual Skills:

1. Ability to read job drawings.
2. Ability to identify and select proper material, tools and equipments and machines.
3. Ability to select proper parameters (like cutting speed, feed, depth cut use of lubricants) in machine.

Motor Skills:

1. Ability to set tools, work piece, and machines for desired operations.
2. Ability to complete job as per job drawing in allotted time.
3. Ability to use safety equipment and follow safety procedures during operations.
4. Ability to inspect the job for confirming desired dimensions and shape.
5. Ability to acquire hands-on experience

SR. NO.	DETAILS OF PRACTICAL CONTENTS
01	<p>WOOD WORKING SHOP:</p> <ul style="list-style-type: none"> • Any one composite job from the following involving different joint, turning and planning, surface finishing by emery paper, varnishing etc. like square stool, tea table, center table, chaurang, table lamp bed sofa-set, book rack. Cabinet, notice board, shows cases, tables chairs etc. <p>Note:1] One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work. 3] Job allotted should comprise of 6-8 hours of actual working 4] Student shall calculate the cost of material and labor cost for their job from the drawing.</p>
02	<p>WELDING SHOP</p> <ul style="list-style-type: none"> • Any one composite job from involving butt joint lap joint welding process, from the following like Grill, door, window frame, waste paper basket, Chappel stand, Corner flower stand chair , table frame (square pipe 25 mm) cooler frame (folding type) <p>Note: 1] One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work. 3] Job allotted should comprise of 6-8 hours of actual working operations. 4] Student shall calculate the cost of material and labor required for</p>

	their job from the drawing.
03	<p>SMITHY SHOP</p> <ul style="list-style-type: none"> • Demonstration of different forging tools and Power Hammer. • Demonstration of different forging processes, likes shaping, caulking fullering, setting down operations etc. • One job like hook peg, flat chisel or any hardware item. <p>Note: 1] One job of standard size (Saleable/marketable article shall be preferred) 2] Job allotted should comprise of 4-6 hours of actual working operations. 3] Student shall calculate the cost of material and labor required for their job from the drawing.</p>
04	<p>PLUMBING SHOP</p> <ul style="list-style-type: none"> • Demonstration of PVC pipe joint with various fittings. • Exercise for students on preparing actual pipeline layout for G.I. Pipe or PVC pipe. Preparing actual drawing and bill of material. <p>Note:1] One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work. 3] Job allotted should comprise of 6-8 hours of actual working 4] Student shall calculate the cost of material and labor cost for their job from the drawing.</p>
05	<p>SHEET METAL SHOP</p> <ul style="list-style-type: none"> • One composite job from the following: Letter box, Trunk, Grain Container, Water-heater Container, Bucket, Waste Paper Basket, Cooler Tray, Water-draining Channel, etc. (including soldering and riveting) <p>Note:1]One job of standard size (Saleable/marketable article shall be preferred) 2] Batch size should be selected depending on volume of work. 3] Job allotted should comprise of 4-6 hours of actual working ions. 4] Student shall calculate the cost of material and labor cost required for their job from the drawing.</p>
06	<p>Demonstration of power tools and practice of utility items.</p> <ul style="list-style-type: none"> • Demonstration of advance power tools, pneumatic tools, electrical wiring tools and accessories. • Making of electrical switchboard with 2 sockets and piano buttons and with electrical wiring. • Any other item as per the requirement of college/Department (Note: Utility item are not to be assessed)

Learning Resources:**Books:**

Sr. No.	Name of the Author	Name of the Book	Publisher
01	S.K. Hajara Chaudhary	Workshop Technology	Media Promotors and Publishers, New Delhi
02	B.S. Raghuwanshi	Workshop Technology	Dhanpat Rai and Sons, New Delhi
03	R K Jain	Production Technology	Khanna Publishers, New Delhi
04	H.S.Bawa	Workshop Technology	Tata McGraw Hill Publishers, New Delhi
05	--	Kent's Mechanical Engineering Hand book	John Wiley and Sons, New York

Video Cassettes/ CDS

Learning Materials Transparencies, CBT Packages developed by NITTER Bhopa

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:

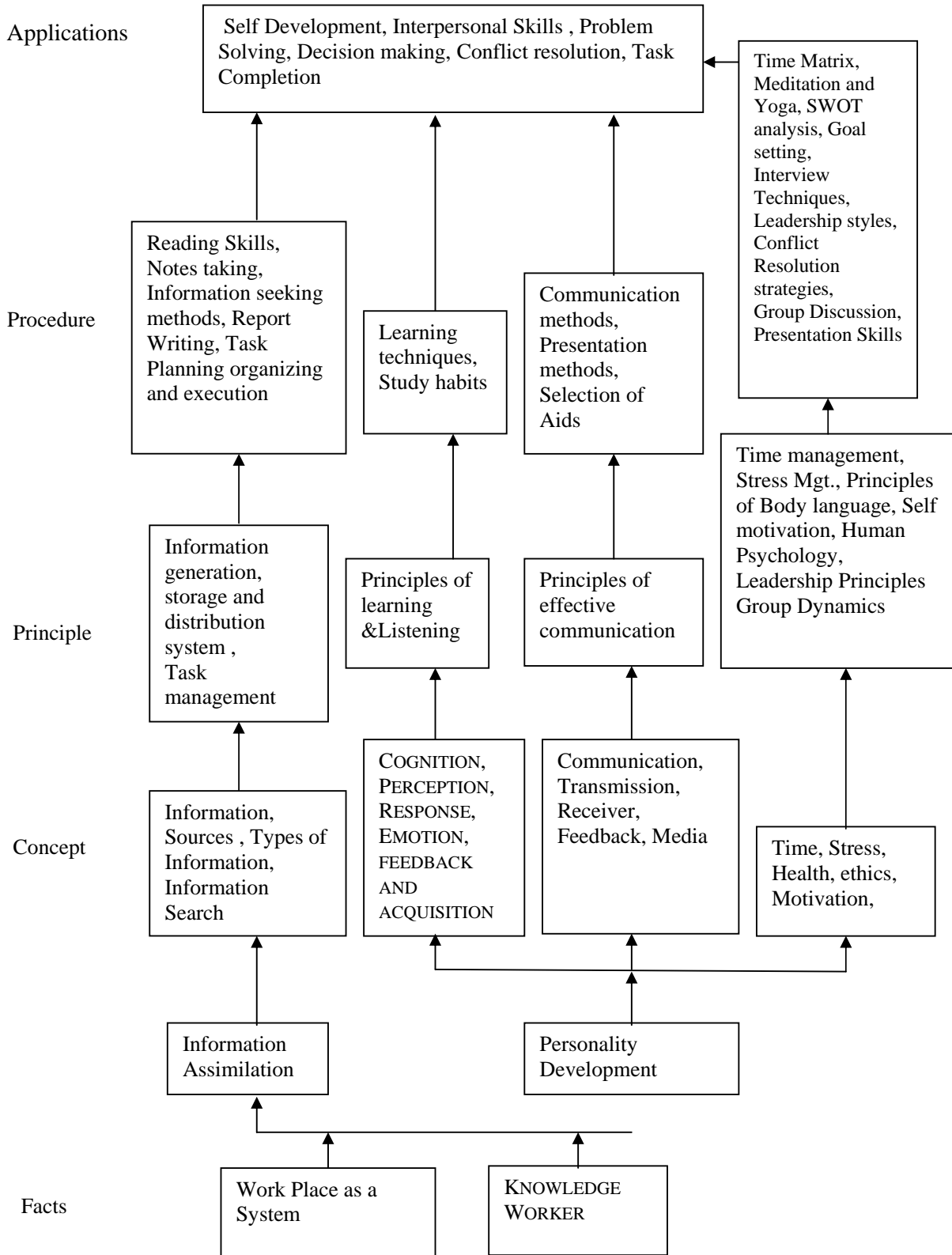
In today's competitive world, the nature of organizations is changing at very rapid speed. In this situation the responsibility of diploma holder is not unique. He will be a part of a team in the organization. As such the individual skills are not sufficient to work at his best.

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 : Civil Engineering Group

Course Code : CE/CS/CR/CV

Semester : Second

Subject Title : Professional Practices-II

Subject Code : 12705

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 in 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.

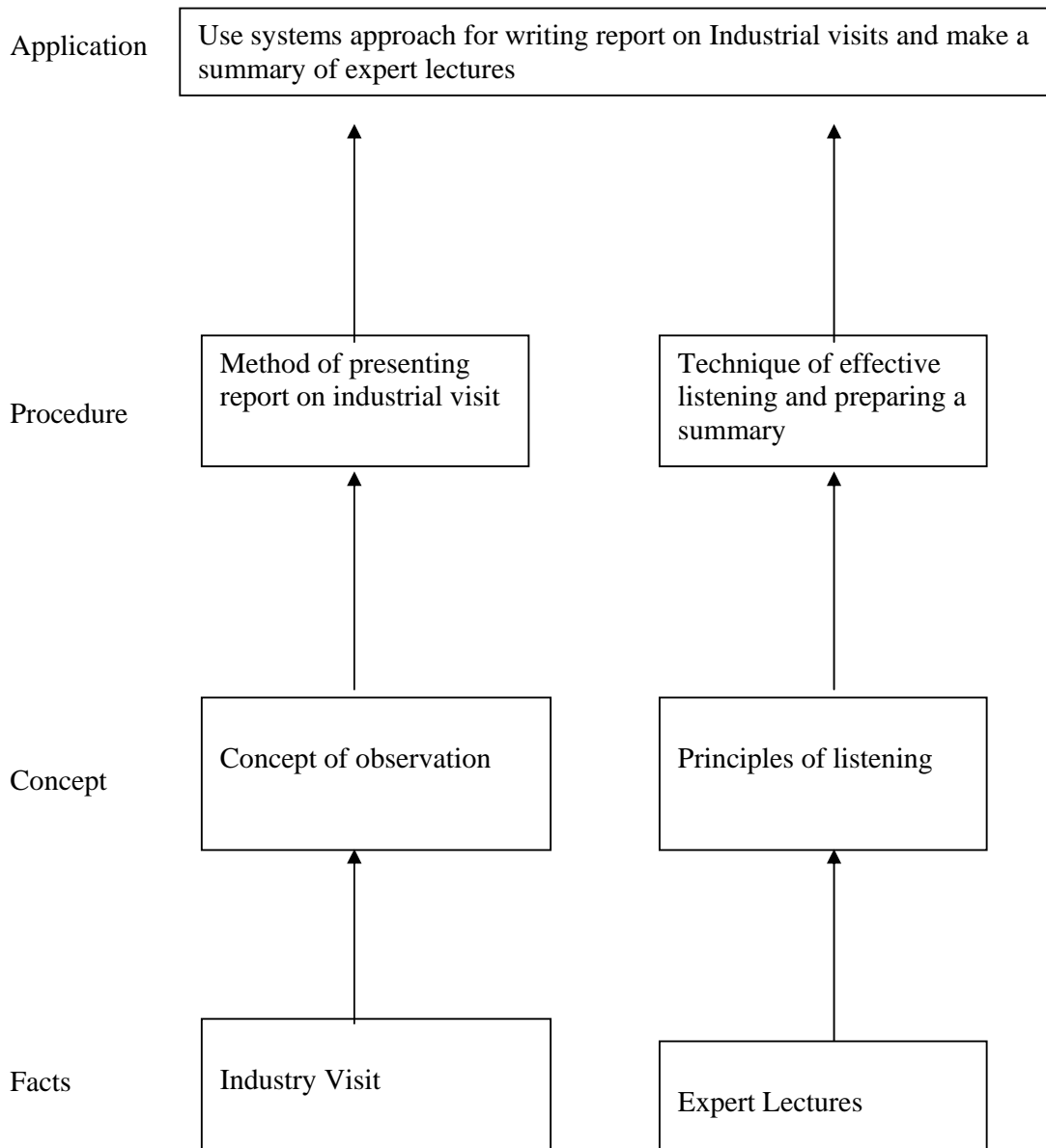
The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation 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
1	<p>Industrial Visits:</p> <p>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 :</p> <ul style="list-style-type: none"> i) Construction site for residential / Public building ii) Tile manufacturing unit iii) Water treatment plant iv) Road construction site v) Architect/Structural design Office 	14
2	<p>Lectures by Professional / Industrial Expert to be organized on any three topics of the following suggested areas or any other suitable topics:</p> <ul style="list-style-type: none"> i) Pollution control. ii) Acoustics. iii) Fire Fighting / Safety Precautions and First aids. iv) Vedic Mathematics. v) Topics related to Social Awareness such as –Traffic Control System, Career opportunities , Communication in Industry, Blood Donation Camp, Yoga Meditation, Aids awareness and health awareness 	10
3	<p>Group Discussion :</p> <p>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 -</p> <ul style="list-style-type: none"> i) Sports ii) Cultural iii) Discipline and House Keeping iv) Current topic related to civil engineering field. 	08
Total		32