STATE BOARD OF TECHNICAL EDUCATION, JHARKHAND

TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES

COURSE NAME : MECHANICAL ENGINEERING GROUP

DURATION OF COURSE : 6 SEMESTERS | **WITH EFFECT FROM 2011-12**

SEMESTER : SECOND | **DURATION : 16 WEEKS**

PATTERN : FULL TIME - SEMESTER

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	
2	Engineering Mathematics	EMS	12013	03	01	--	03	100	40	--	--	--	--	--	--	
3	Applied Science (Mechanical)	ASM	12014	04	--	04	03	100	40	50@	20	--	--	--	--	
4	Engineering Mechanics	EGM	12015	03	--	02	03	100	40	--	--	--	--	25@	10	50
5	Engineering Drawing	EDG	12016	01	--	04	04	100	40	--	--	--	--	50@	20	
6	Workshop Practice	WPC	12017	--	--	04	--	--	--	--	--	--	--	50@	20	
7	Development of Life Skills-I	DLS	12018	01	--	02	--	--	--	--	--	25#	10	25@	10	
8	Professional Practices-II	PPS	12019	--	--	02	--	--	--	--	--	--	--	50@	20	
	TOTAL			**14**	**01**	**20**	**--**	**500**	**--**	**50**	**--**	**50**	**--**	**225**	**--**	**50**

Student Contact Hours Per Week: **35 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 875**

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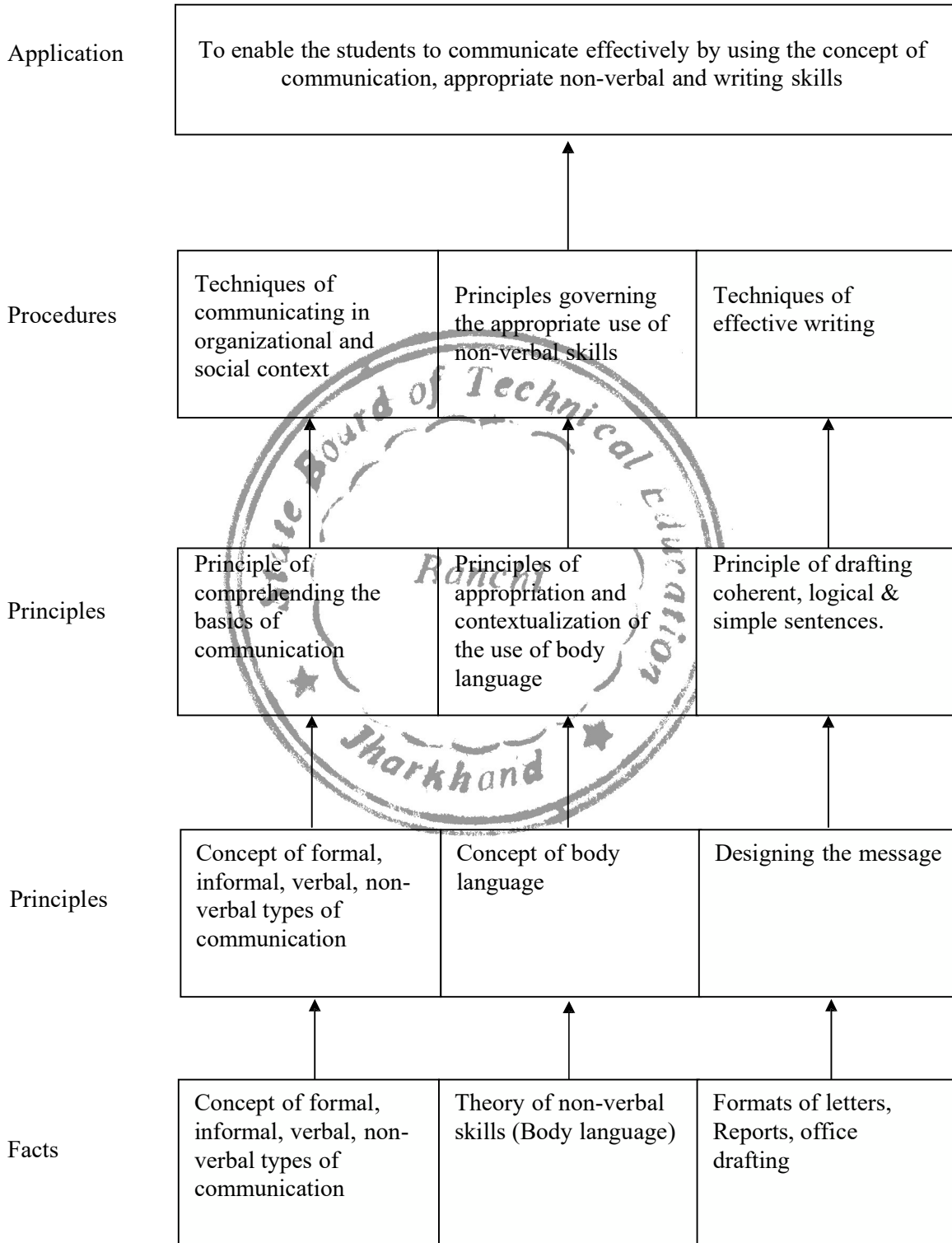   **and to be entered in mark sheet under the head Sessional Work. (SW)**

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:

Application	To enable the students to communicate effectively by using the concept of communication, appropriate non-verbal and writing skills		
Procedures	Techniques of communicating in organizational and social context	Principles governing the appropriate use of non-verbal skills	Techniques of effective writing
Principles	Principle of comprehending the basics of communication	Principles of appropriation and contextualization of the use of body language	Principle of drafting coherent, logical & simple sentences.
Principles	Concept of formal, informal, verbal, non-verbal types of communication	Concept of body language	Designing the message
Facts	Concept of formal, informal, verbal, non-verbal types of communication	Theory of non-verbal skills (Body language)	Formats of letters, Reports, office drafting

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- Kinesecs , 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 pate 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 aprper Index and get it duly certified.

Learning Resources:

Books:

Sr. No.	Author	Title	Publisher
01	SBTE, Mumbai.	Text book of Communication Skills.	SBTE, 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.BM Consultant 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.

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 SBTE.**
- ➢ **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 Æ 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
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,	06	16

	Subtraction, Multiplication and Division)		
	6.3 De-Moivre's theorem (without proof) Examples based on it, 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 : Mechanical Engineering Group

Semester   : Second

Subject Title : Applied Science (Mechanical Group)

Subject Code : 12014

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: 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:
> Two tests each of 25 marks to be conducted as per the schedule given by SBTE.
> 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 (12014)

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.
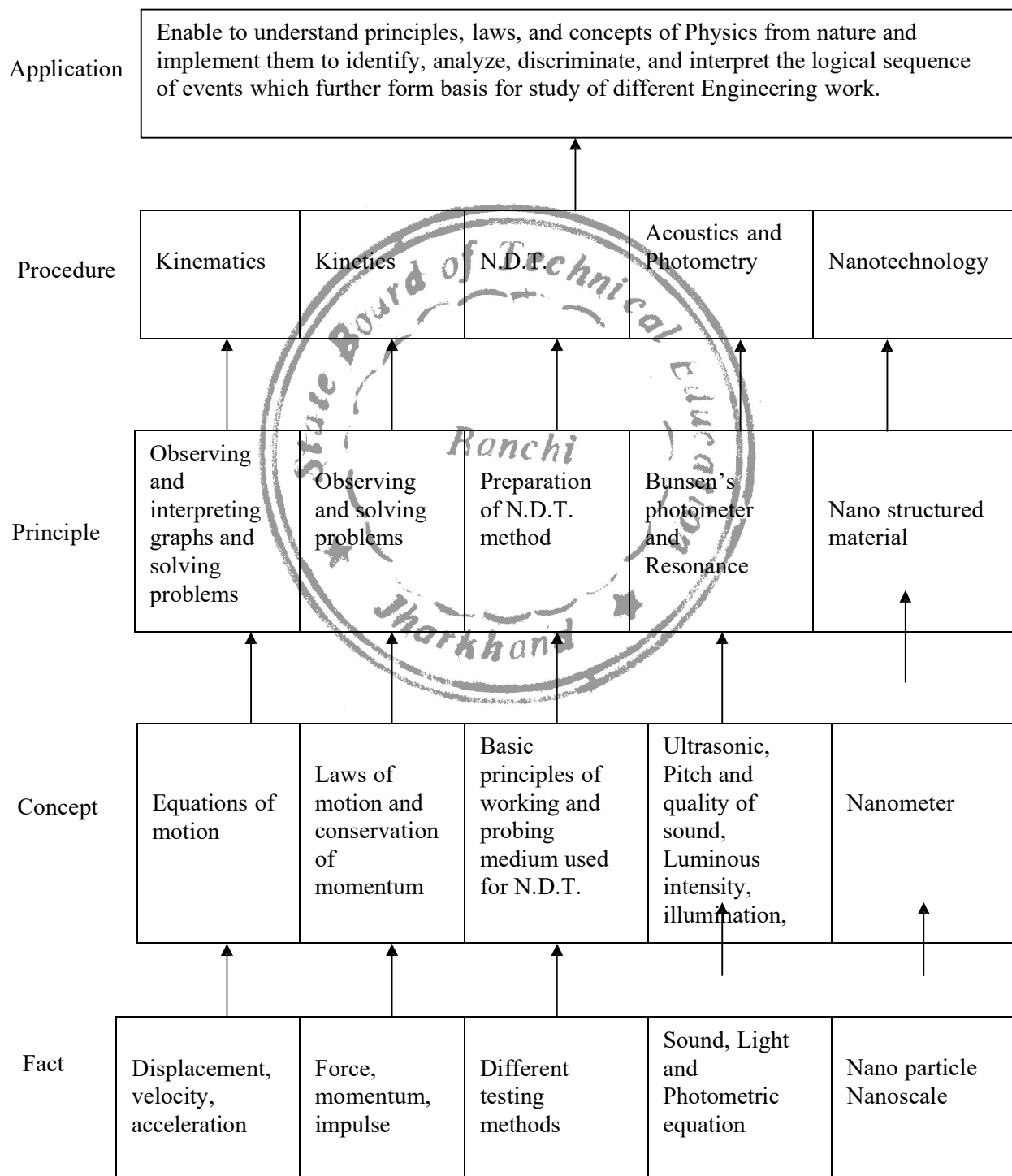
Objectives:
The Student will be able to:
1. Differentiate kinetic and kinematics and solve the problems on kinematics and kinetics.
2. Graphically represent rectilinear motion, S.H.M. and use for solving engineering problems.
3. Understand the concept of ultrasonics.
4. Use N.D.T. in quality assurance and saving of man power, machining, materials,

5. Use principles of illumination for enhancing work efficiency
6. Analyze variation of sound intensity with respect to distance.
7. Identify different factors affecting acoustical planning of buildings
8. Identify different factors affecting indoor lighting.
9. Able to understand new technological aspect like Nano-technology

Learning Structure:

Application	Enable to understand principles, laws, and concepts of Physics from nature and implement them to identify, analyze, discriminate, and interpret the logical sequence of events which further form basis for study of different Engineering work.				
Procedure	Kinematics	Kinetics	N.D.T.	Acoustics and Photometry	Nanotechnology
Principle	Observing and interpreting graphs and solving problems	Observing and solving problems	Preparation of N.D.T. method	Bunsen's photometer and Resonance	Nano structured material
Concept	Equations of motion	Laws of motion and conservation of momentum	Basic principles of working and probing medium used for N.D.T.	Ultrasonic, Pitch and quality of sound, Luminous intensity, illumination,	Nanometer
Fact	Displacement, velocity, acceleration	Force, momentum, impulse	Different testing methods	Sound, Light and Photometric equation	Nano particle Nanoscale

Contents: Theory

Chapter	Name of The Topic	Hours	Marks
01	**1. Kinematics** **1.1 Rectilinear Motion** Equations of Motions-$v=u+at$, $s=ut+1/2at^2$, $V^2=u^2+2as$ (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]**	04	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 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.]**	04	06
03	**Ultrasonic and Non –destructive testing of Materials.** **3.1 Ultrasonic** Ultrasonic waves-Definition and range, Production of ultrasonic waves by Piezoelectric and magnetostriction method.	02	04
	3.2 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]**	05	08

	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**
04	**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]**	**04**	**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 defence.	**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 Resources:
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	Resnic,Halliday,walker	Fundamentals of Physics	Wiley publications
04	Dr. S. K. Kulkarni	Nanotechnology- principles and practices	Capital publishing company

Web Sites :
1) hyper-physics.com
2) physics.org
3) physics.about.com
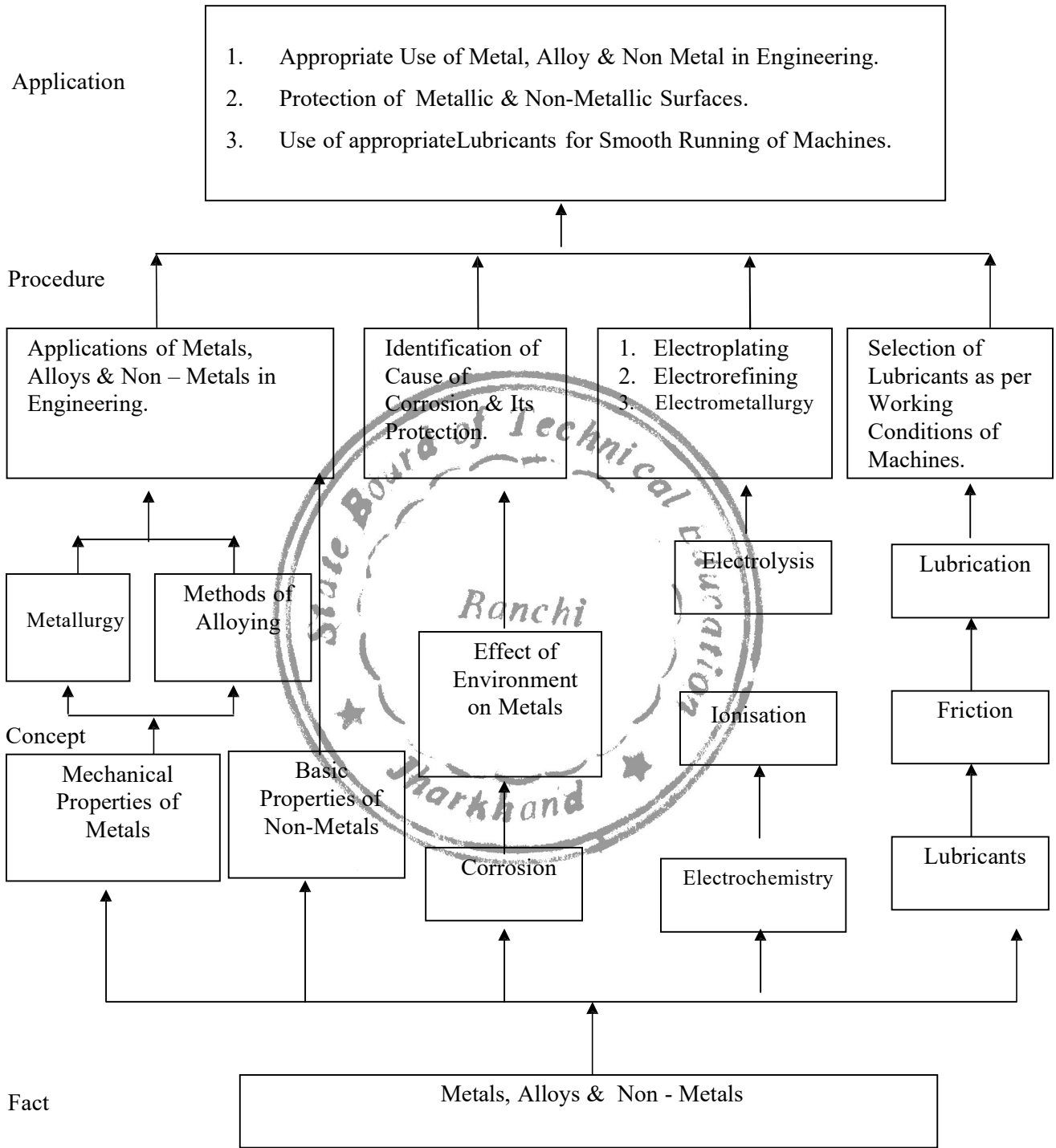4) physicscllasroom.com

Part B: Applied Chemistry (12014)

This syllabus of chemistry for Mechanical / Production / Automobile Students is classified Under the Category of Applied Science. It is intended to teach students the appropriate use of engineering materials, their protection & lubrication processes in different working conditions of machines.

Objectives:
The student will be able to:
1. Suggest the appropriate use of metals, alloys & non metallic materials in engineering.
2. Applying the Knowledge to Protect Metallic & Non Metallic Surfaces
3. Select Lubricants for Smooth Running of Machines.

Learning Structure:

Application

1. Appropriate Use of Metal, Alloy & Non Metal in Engineering.
2. Protection of Metallic & Non-Metallic Surfaces.
3. Use of appropriateLubricants for Smooth Running of Machines.

Procedure

Applications of Metals, Alloys & Non – Metals in Engineering.	Identification of Cause of Corrosion & Its Protection.	1. Electroplating 2. Electrorefining 3. Electrometallurgy	Selection of Lubricants as per Working Conditions of Machines.

Electrolysis

Lubrication

Metallurgy

Methods of Alloying

Effect of Environment on Metals

Ionisation

Friction

Concept

Mechanical Properties of Metals

Basic Properties of Non-Metals

Corrosion

Electrochemistry

Lubricants

Fact

Metals, Alloys & Non - Metals

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 & numericals, Applications of pH, Buffer Solutions.	02	04
02	**Non Metallic Engineering Materials** (Plastic, Rubber, Insulators, Refractories, Composite Material, Ceramics) **Engineering Plastic:** Special Characteristics & Engineering Applications of polyvinyl chloride, polystyrene, Kevlar, Backelite, Epoxy resins, Polycarbonates (Like Lexan, Merlan), Polyurethanes (Like Perlon – U), Silicon grease, Polyacetals, Teflon, Reinforced plastic, Thermocole, reclaimed rubber, Silicon rubber. **Ceramics:** Definition, Properties & Engineering Applications, Types – Structural Ceramics, Facing Material, Refractories, Fine Ceramics, Special Ceramics. **Refractories:** Definition, Properties, Applications & Uses of Fire Clay, Bricks, Silica Bricks. **Composite Materials:** Definition, Properties, Advantages, Applications & Examples.	07	12
03	**Metals & Alloys** **Metals** – <u>Metallurgy of Iron :</u> Terms Involved in Metallurgy, Indian Resources of Fe, Important Ores of Iron , Extraction process , Smelting in Blast Furnace, Chemical Reactions in Blast Furnace, Products of Blast Furnace, their Composition, Application, Commercial Forms of Iron, (Pig Iron / Cast Iron, Wrought or Malleable Steel), their Composition, Properties & Applications, Types of Casting (Chilled Casting, Centrifugal Casting & Malleable Casting), Heat Treatment of Cast Iron & Steel. **Alloys** – Definition, Types of alloy , <u>**Ferrous Alloys**</u> – Steel, Composition, Properties & Applications of Plain Carbon Steel (Low Carbon, Medium Carbon, High Carbon & Very Hard Steel) & Alloy Steels, (Heat Resisting, Shock Resisting, Magnetic, Stainless, Tool Steel & HSS), Effect of Various Alloying Elements (Cr, W, V, Ni, Mn, Mo, Si) etc. on Steel. <u>**Non-Ferrous Alloys**</u> – Copper Alloy – Brass, Bronze, Nickel Silver or German Silver, their Composition, Properties & Applications.	11	14

	Aluminium Alloy – Duralumin, Solders – Soft Solder, Brazing Alloy, Tinamann's Solder, Nickel Alloy – Nichrome Metal, Low Melting Alloys – Rose Metal.		
04	**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 Conditions & Application of Protective Coatings like metal coating by Galvanising, Tinning, Metal Spraying, Sherardizing, Electroplating, Metal Clodding, Cementation or Diffusion Method, their Definition, Procedure, Uses, Advantages & Disadvantages, Examples 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
05	**Lubricant** Lubricant- Definition, Classification with examples, Functions of lubricant, Lubrication Mechanism by Fluid Film, Boundary, Extreme Pressure, Physical Characteristics of Lubricants Such as Viscosity, Viscosity Index, Oilness, Volatility, Flash & Fire Point, Cloud & Pour Point, Chemical Characteristics such as Acid Value or Neutralization Number, Emulsification, Saponification Value, Selection of Lubricants for Various Types of Machineries.	04	08
	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 determine neutralization point of acetic acid (weak acid) and ammonium hydroxide acid (weak base). To calculated normality and strength of acetic acid.
03	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.
04	To verify Faraday's second law of electrolysis.
05	To determine pH of given solution by using pH paper, universal indicator and pH meter.
06	To determine the strength of given hydrochloric acid solution by titrating it against sodium hydroxide solution by using pH meter.
07	To determine percentage of copper from brass iodometrically.
08	To determine thinner content in Oil paint.
09	To determine acid value of given lubricant.
10	To determine viscosity of given oil by using Ostwald's viscometer.
11	To determine the saponification value of given lubricant oil.
	Laboratory based mini projects
12	To collect different oil lubricants and test them for viscosity and acid value. To observe the suitability of oil lubricants on the basis of their properties.
13	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 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 : **Civil, Mechanical and Electrical Group**

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 SBTE.**
- ➢ **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)
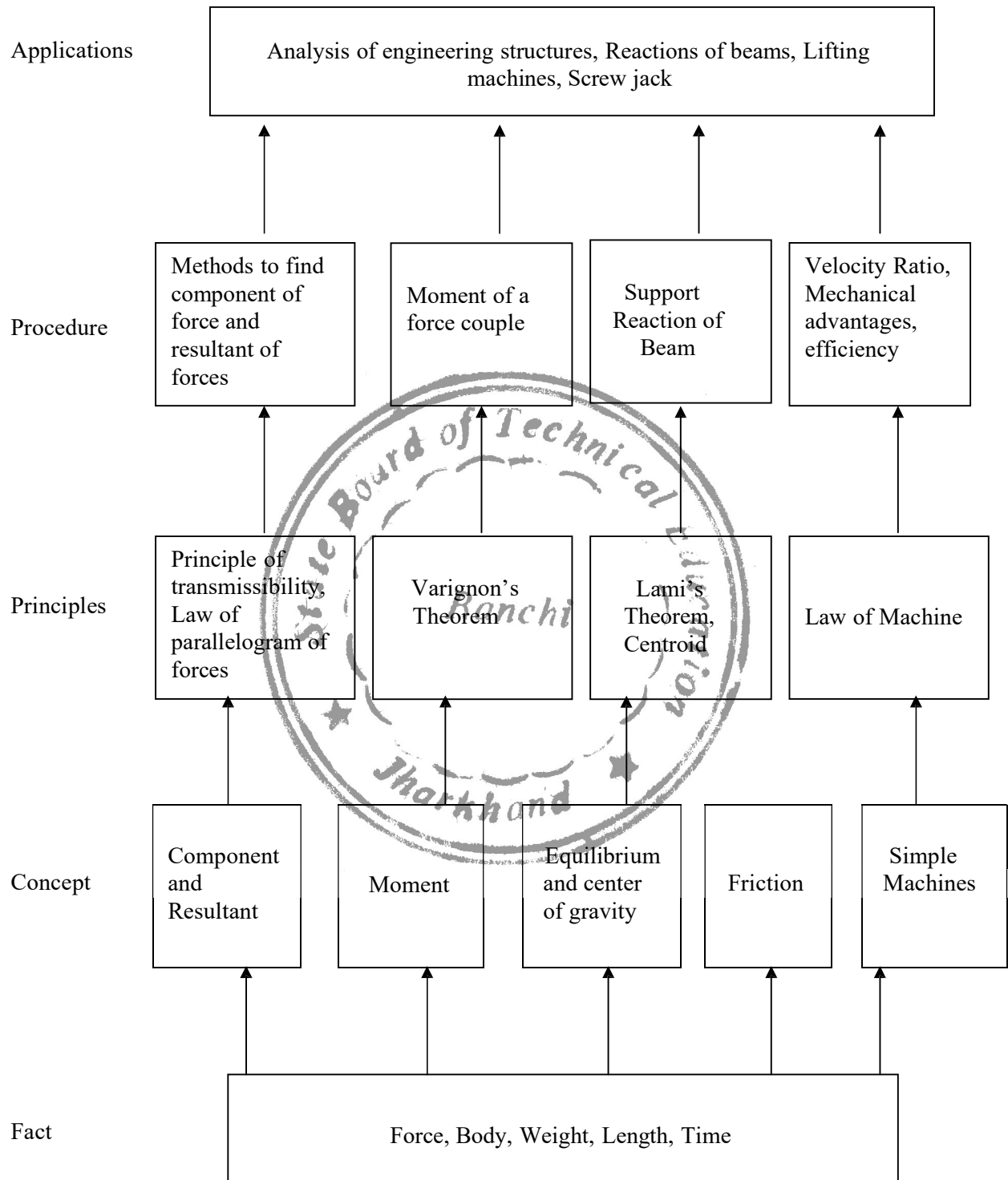
Rationale:

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:

Applications	Analysis of engineering structures, Reactions of beams, Lifting machines, Screw jack

Procedure	Methods to find component of force and resultant of forces	Moment of a force couple	Support Reaction of Beam	Velocity Ratio, Mechanical advantages, efficiency

Principles	Principle of transmissibility, Law of parallelogram of forces	Varignon's Theorem	Lami's Theorem, Centroid	Law of Machine

Concept	Component and Resultant	Moment	Equilibrium and center of gravity	Friction	Simple Machines

Fact	Force, Body, Weight, Length, Time

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Force** **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. **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. **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. **1.4 Resolution of a force:** Definition, Method of resolution, Types of Component of a force - Perpendicular component and Non-perpendicular component. **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. **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.	12	24
02	**Equilibrium:** 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. 2.2 Lami's Theorem – statement and explanation, Application of Lami's theorem for solving various engineering problems having two unknowns only. 2.3 Equilibrant – Definition, relation between resultant and equilibrant, equilibrant of concurrent and non-concurrent force system. 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.	10	20

03	**Friction:** 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. 3.2 Equilibrium of bodies on level plane – external force applied horizontal and inclined (Pull & Push) 3.3 Equilibrium of bodies on inclined plane – external forces is applied parallel to the plane. 3.4 Ladder friction.	08	20
04	**Centroid and Centre Of Gravity:** 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. 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)	08	16
05	**Simple Machines:** 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 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. 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. 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.	10	20
	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 : **Mechanical Engineering Group**

Semester : **Second**

Subject Title : **Engineering Drawing**

Subject code : **12016**

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
01	--	04	04	100	--	---	50@	150

Notes: -
1. Students should use two separate A3 size sketchbooks, one for class work practice and another for assignment.
2. Students should solve assignment on each topic.
3. Use approximately 570mm×380mm Size Drawing Sheet for Term Work.

NOTE:
➢ **Two tests each of 25 marks to be conducted as per the schedule given by SBTE.**
➢ **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)**
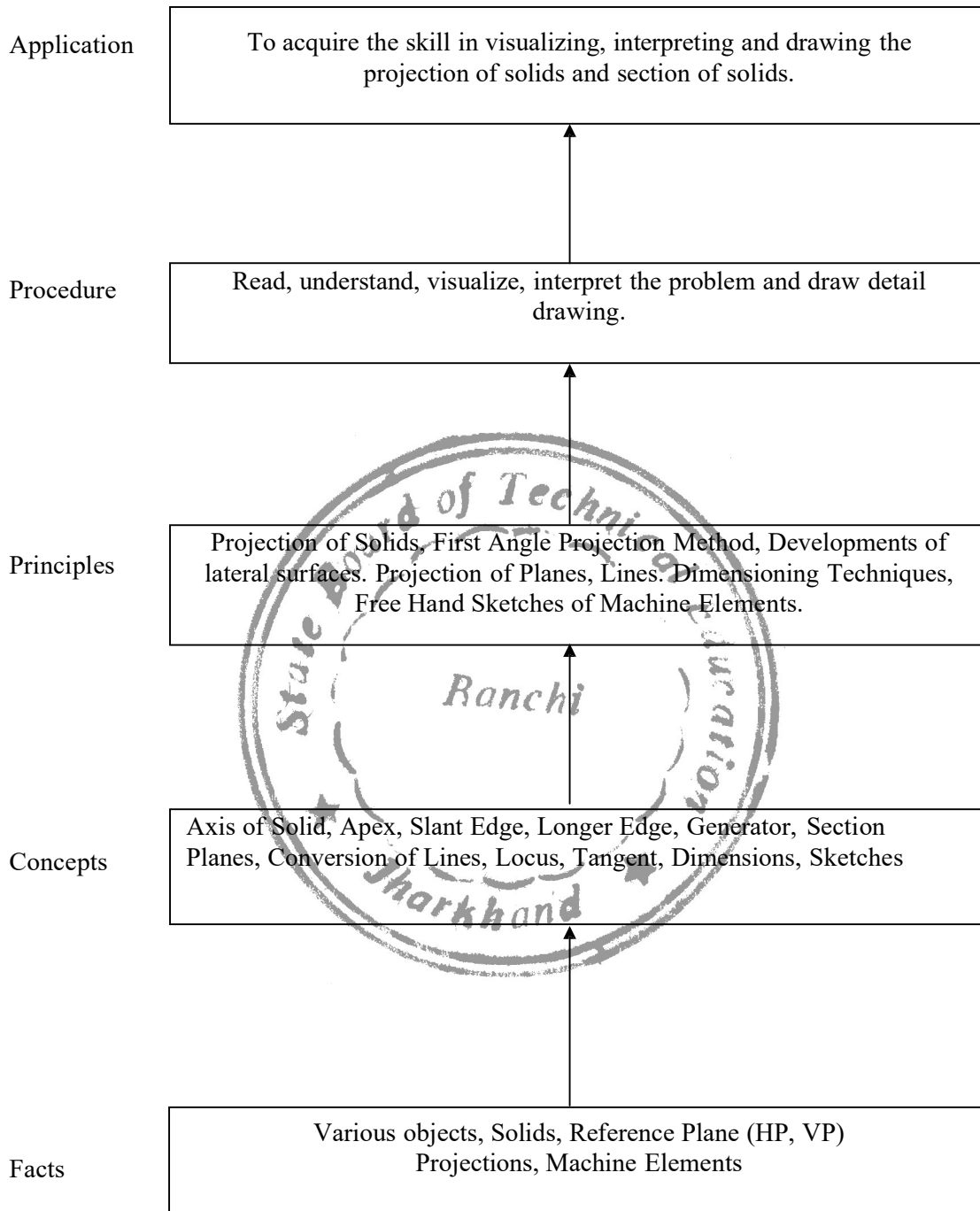
Rationale:

Engineering drawing is the graphical language of engineers. It describes the scientific facts, concepts, principles and techniques of drawing in any engineering field to express the ideas, conveying the instructions, which are used to carry out jobs in engineering field. This course aim for building a foundation for the further course in drawing and other allied subjects.

Objectives:

The students shall be able to:

1. Understand the basic concepts of engineering drawing.
2. Visualize the objects.
3. Draw different views in different positions of objects.
4. Draw the different views of machine elements.

Learning Structure:

Application	To acquire the skill in visualizing, interpreting and drawing the projection of solids and section of solids.

↑

Procedure	Read, understand, visualize, interpret the problem and draw detail drawing.

↑

Principles	Projection of Solids, First Angle Projection Method, Developments of lateral surfaces. Projection of Planes, Lines. Dimensioning Techniques, Free Hand Sketches of Machine Elements.

↑

Concepts	Axis of Solid, Apex, Slant Edge, Longer Edge, Generator, Section Planes, Conversion of Lines, Locus, Tangent, Dimensions, Sketches

↑

Facts	Various objects, Solids, Reference Plane (HP, VP) Projections, Machine Elements

Contents: Theory

Note: The teachers should use some of the practical hours for teaching basic theory during practicals as required.

Chapter	Name of the Topic	Hours	Marks
1.	**Sectional Views.** 1.1 Types of sections 1.2 Conversion of pictorial view into sectional orthographic views (First Angle Projection Method only)	03	16
2.	**Missing Views.** 2.1 Draw missing view from the given Orthographic views - simple components (First Angle Projection Method only)	01	08
3.	**Isometric Projection** 3.1 Conversion of Orthographic Views into Isometric view/projection (Including rectangular, cylindrical objects, representation of slots on sloping as well as plane surfaces)	03	16
4.	**Projections of Solids.** 4.1 Projections of Prism, Pyramid, Cone, Cylinder, Tetrahedron, Cube with their axes inclined to one reference plane and parallel to other.	02	12
5.	**Sections of Solids.** 5.1 Solids: -Prism, Pyramid, Cone, Cylinder, Tetrahedron, Cube. 5.2 Cone, Pyramid and Tetrahedron resting on their base on Horizontal Plane. 5.3 Prism, Cylinder: -a)Axis parallel to both the reference plane 　　　　　　　b) Resting on their base on HP. 5.4 Section plane inclined to one reference plane and perpendicular to other.	03	16
6.	**Developments of Surfaces.** 6.1 Developments of Lateral surfaces of cube, prisms, cylinder, pyramids, cone and their applications such as tray, funnel, Chimney, pipe bends etc.	02	16
7.	**Free Hand Sketches** 7.1 Free hand sketches of nuts, bolts, rivets, threads, split pin, foundation bolts, keys and couplings.	02	16
	Total	16	100

Practical:

List of Practical	Skills to be Developed	
	Intellectual skill	**Motor Skill**
1.Sectional View - (Total 2 Sheets) Two objects by First Angle Projection Method – (1 Sheet) Redraw the same sheet using CAD - (1 Sheet)	1)To interpret sectional views of given object.	Develop ability to draw sectional views Using computer.
2. Isometric projection - (Total 2 sheets) Two objects one by true scale and another by isometric scale - (1 sheet) Draw **one** sheet having two problems in each sheet using CAD - (Plot any one)	1) Develop ability to differentiate between isometric view and isometric projections. 2) To differentiate between Isometric scale and true scale.	Develop ability to draw isometric views and isometric projections from given orthographic views of an object using computer.
3. Missing Views Two problems by first angle projection method - (1 Sheet)	1) To interpret the missing view from given orthographic views.	1) To develop ability to draw missing view from given orthographic views.
4. Projection of solids Two problems on two different solids, one by axis of solid inclined to HP and parallel to VP and another problem by axis of solid inclined to VP and parallel to HP. - (1 Sheet)	1) To interpret the different positions of solids with reference planes. 2) To develop ability to differentiate between true length of axis and apparent length of axis. 3) To develop ability to differentiate between true shape and apparent shape of solids.	1) To draw projections of different solids when axis is inclined or perpendicular to one of the reference plane.
5. Section of solids Two problems on different solids. One problem, section plane inclined to HP and perpendicular to VP and in another problem, section plane inclined to VP and Perpendicular to HP. - (1 Sheet)	1) To differentiate between true shape and apparent shape of section. 2) To interpret the positions of section plane with reference planes.	1) To develop ability to draw sectional orthographic views of given solids, when it is cut by section plane in different position with reference planes. 2) Ability to draw true shape of section.

6. Development of surfaces Any two problems on development of surfaces of different objects. - (1 Sheet)	1) Able to interpret the development of surfaces of different solids.	1) Ability to draw the development of surfaces of different objects in different shapes.
7. Free Hand Sketches Any six figures on different topics. - (1 Sheet)	1) To differentiate between scale drawing and free hand drawing. 2) To differentiate between various parts of machine like nuts, bolts, screws, different threads, couplings etc.	1) Develop ability to draw orthographic views of different machine elements.

List of Practice Oriented Projects:

To find out the total sheet metal required for a given object.

Learning Resources:

A. **Books: -**

Sr. No	Author	Title	Publication
1	N. D. Bhatt	Engineering Drawing	Charotkar Publishing House
2	R. K. Dhawan	Engineering Drawing	S. Chand Co.
3	P. J. Shah	Engineering Drawing	--
4	N. D. Bhatt	Machine Drawing	Charotkar Publishing House
5	K. Venugopal	Engineering Drawing and Graphics + AutoCAD	New Age Publication
6	K. R. Mohan	Engineering Graphics	Dhanpat Rai and Publication Co.
7	R. K. Dhawan	Machine Drawing	S. Chand Co.

B. **Video Cassettes / CD's**

1. Instructional / Learning CD developed by ARTADDICT.

C. **IS Codes:**

SP – 46. Engineering Drawing practice for schools and colleges.

Course Name : Mechanical Engineering Group

Semester   : Second

Subject Title : Workshop Practice

Subject Code : 12017

Teaching and Examination Scheme:

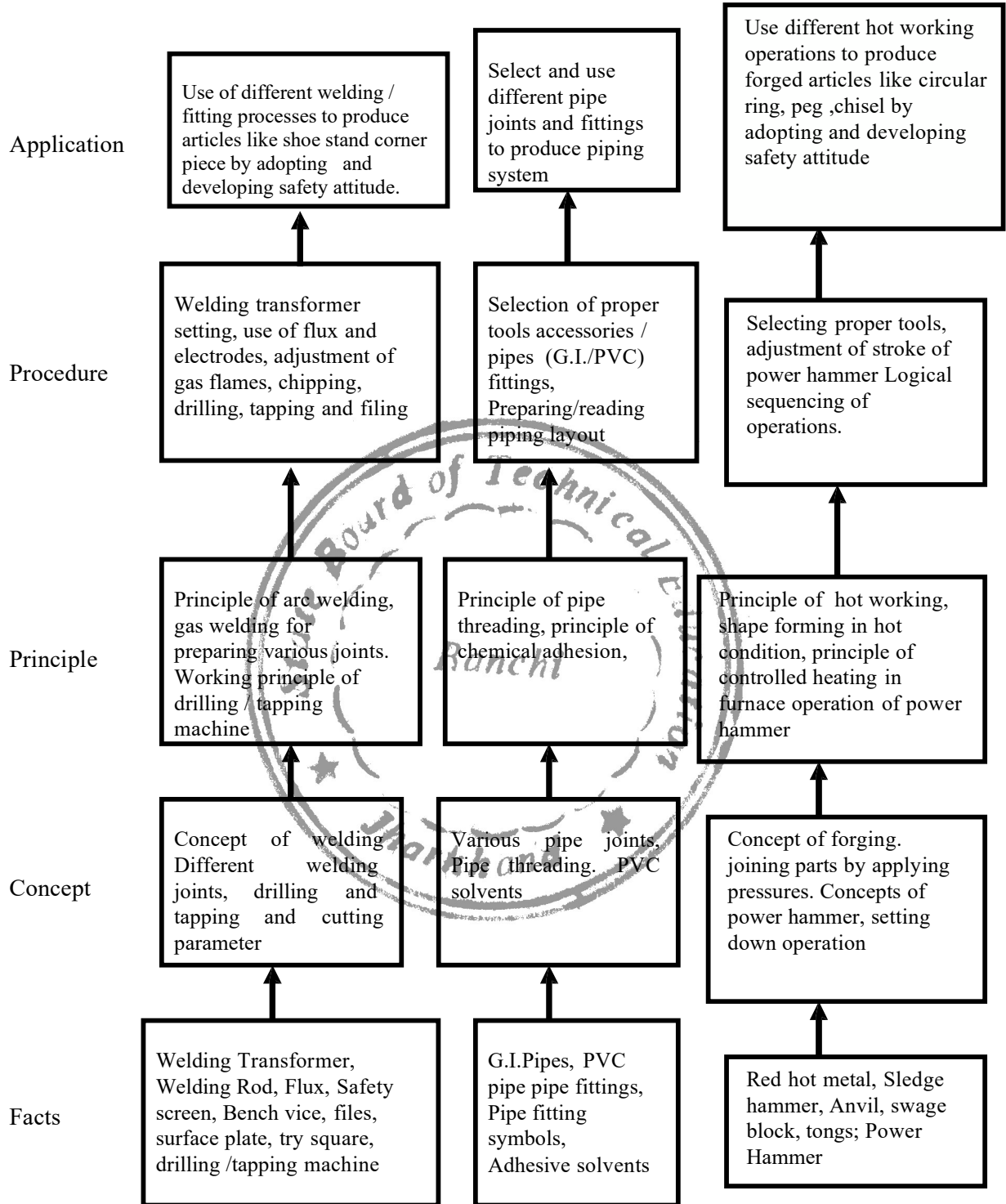| Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	04	--	--	--	--	50@	50

Rationale:

      Mechanical 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:

Application	Use of different welding / fitting processes to produce articles like shoe stand corner piece by adopting and developing safety attitude.	Select and use different pipe joints and fittings to produce piping system	Use different hot working operations to produce forged articles like circular ring, peg ,chisel by adopting and developing safety attitude
Procedure	Welding transformer setting, use of flux and electrodes, adjustment of gas flames, chipping, drilling, tapping and filing	Selection of proper tools accessories / pipes (G.I./PVC) fittings, Preparing/reading piping layout	Selecting proper tools, adjustment of stroke of power hammer Logical sequencing of operations.
Principle	Principle of arc welding, gas welding for preparing various joints. Working principle of drilling / tapping machine	Principle of pipe threading, principle of chemical adhesion,	Principle of hot working, shape forming in hot condition, principle of controlled heating in furnace operation of power hammer
Concept	Concept of welding Different welding joints, drilling and tapping and cutting parameter	Various pipe joints, Pipe threading. PVC solvents	Concept of forging. joining parts by applying pressures. Concepts of power hammer, setting down operation
Facts	Welding Transformer, Welding Rod, Flux, Safety screen, Bench vice, files, surface plate, try square, drilling /tapping machine	G.I.Pipes, PVC pipe pipe fittings, Pipe fitting symbols, Adhesive solvents	Red hot metal, Sledge hammer, Anvil, swage block, tongs; Power Hammer

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

CONTENTS: Subject practical content as shown in the table below:

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	**CARPENTERY SHOP:** • 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. Note:1] One job of standard size (Saleable 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.
02	**WELDING SHOP** • 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)

	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 their job from the drawing.

03	**SMITHY SHOP**
	• 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.
	
	• **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.

04	**PLUMBING SHOP**
	• 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.
	
	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 workin
	    4] Student shall calculate the cost of material and labor cost for their job from the drawing.

05	**SHEET METAL SHOP**
	• 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)
	
	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.

06	**Demonstration of power tools and practice of utility items.** • 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/Deptt./

(Note: Utility item are not to be assessed

Learning Resources:

Books:

Sr. No.	Author	Title	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 Bhopal.

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

Semester   : **Second**

Subject Title   : **Development of Life Skills-I**

Subject Code : **12018**

Teaching and examination scheme:

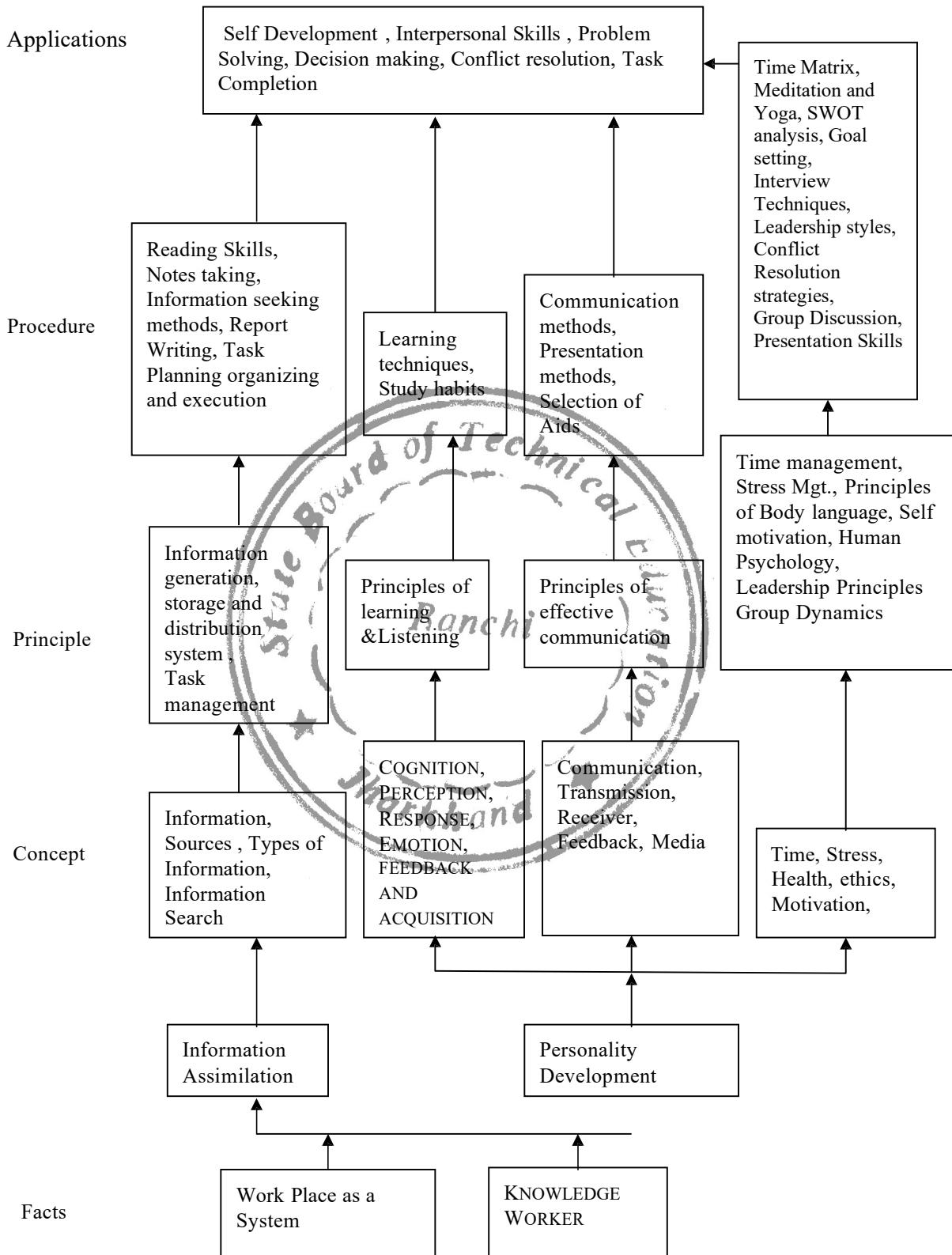| Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	--	--	--	25#	25@	50

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:

Applications

Self Development , Interpersonal Skills , Problem Solving, Decision making, Conflict resolution, Task Completion

Time Matrix, Meditation and Yoga, SWOT analysis, Goal setting, Interview Techniques, Leadership styles, Conflict Resolution strategies, Group Discussion, Presentation Skills

Procedure

Reading Skills, Notes taking, Information seeking methods, Report Writing, Task Planning organizing and execution

Learning techniques, Study habits

Communication methods, Presentation methods, Selection of Aids

Principle

Information generation, storage and distribution system , Task management

Principles of learning &Listening

Principles of effective communication

Time management, Stress Mgt., Principles of Body language, Self motivation, Human Psychology, Leadership Principles Group Dynamics

Concept

Information, Sources , Types of Information, Information Search

COGNITION, PERCEPTION, RESPONSE, EMOTION, FEEDBACK AND ACQUISITION

Communication, Transmission, Receiver, Feedback, Media

Time, Stress, Health, ethics, Motivation,

Information Assimilation

Personality Development

Facts

Work Place as a System

KNOWLEDGE WORKER

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.learningmeditition.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 : Mechanical Engineering Group

Semester   : Second

Subject Title : Professional Practices-II

Subject Code : 12019

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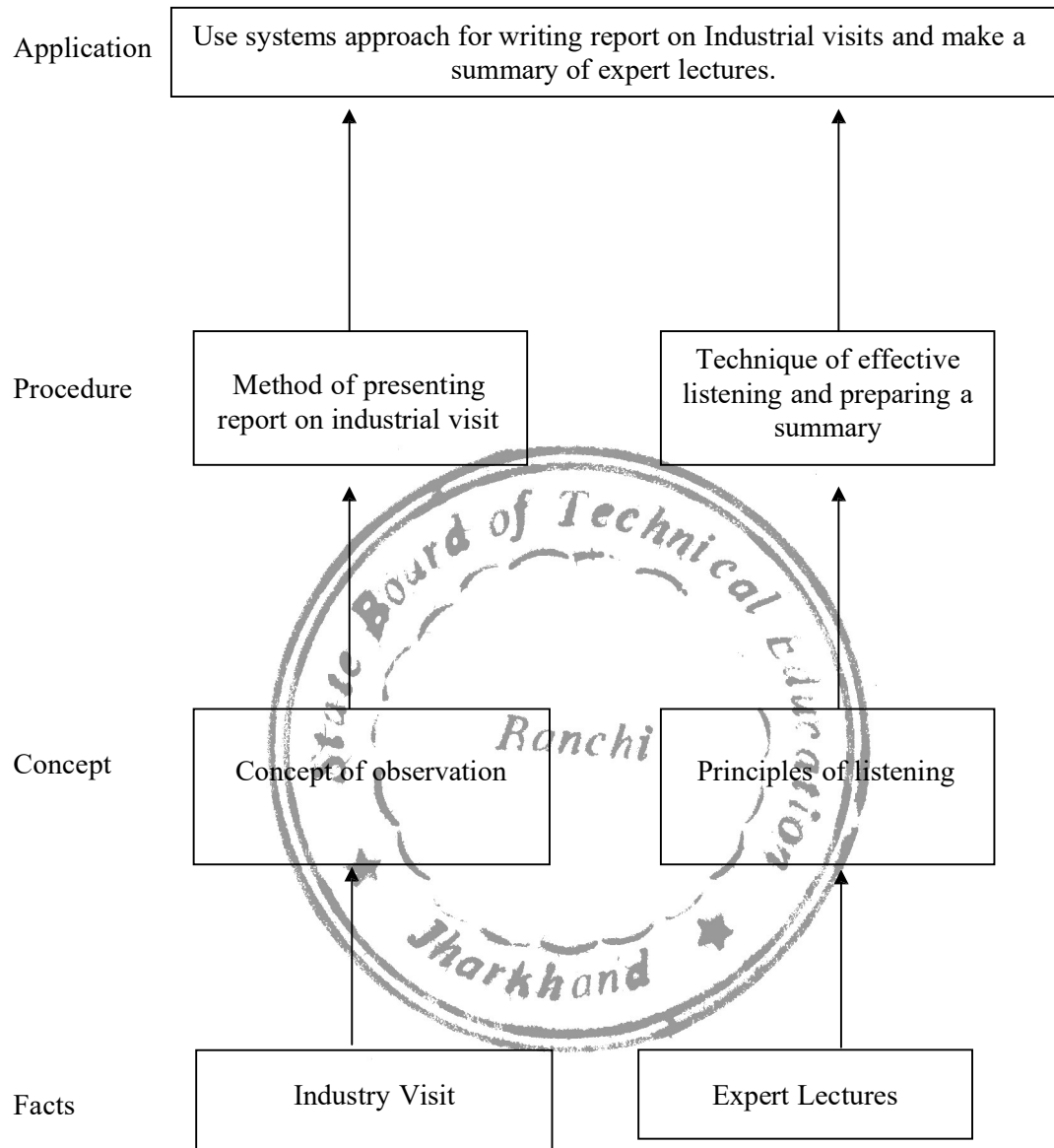
The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation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

Objectives:

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

Learning Structure:

Application | Use systems approach for writing report on Industrial visits and make a summary of expert lectures.

Procedure | Method of presenting report on industrial visit | Technique of effective listening and preparing a summary

Concept | Concept of observation | Principles of listening

Facts | Industry Visit | Expert Lectures

Sr. No.	Activities	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) Nearby Petrol Pump.(fuel, oil, product specifications) ii) Automobile Service Station (Observation of Components / aggregates) iii) Engineering Workshop(Layout, Machines) iv) Dairy Plant / Water Treatment Plant	10
02	Lectures by Professional / Industrial Expert / Student Seminars based on information search to be organized from any THREE of the following areas : i) Pollution control. ii) Non destructive testing. iii) Acoustics. iv) Illumination / Lighting system. v) Fire Fighting / Safety Precautions and First aids. vi) Vedic Mathematics. vii) Computer Networking and Security. viii) Topics related to Social Awareness such as – Traffic Control System, Career opportunities, Communication in Industry, Yoga Meditation, Aids awareness and health awareness.	06
03	**Group Discussion :** The students should discuss in a group of six to eight students and write a brief report on the same as a part of term work. Two topics for group discussions may be selected by the faculty members. Some of the suggested topics are - i) Sports ii) Current news items iii) Discipline and House Keeping iv) Current topics related to mechanical engineering field.	08
04	**Student Activities:** The students in a group of 3 to 4 will perform **any one** of the following activities (others similar activities may be considered Activity : i) Collect and study IS code for Engineering Drawing.. ii) Collecting information from Market: Nomenclatures and specifications of engineering materials. iii) Specifications of Lubricants. iv) Draw orthographic projections of a given simple machine element using and CAD software	08
	Total	32