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 2012-13**

SEMESTER : SECOND **DURATION : 16 WEEKS**

PATTERN : FULL TIME - SEMESTER **SCHEME : G**

SR. NO	SUBJECT TITLE	Abbre viation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										SW (17200)
							PAPER HRS.	TH (1)			PR (4)			OR (8)		TW (9)		
				TH	TU	PR		Max		Min	Max		Min	Max	Min	Max	Min	
1	Communication Skills $	CMS	17201	02	--	02	03	100		40	--		--	25#	10	25@	10	50
2	Engineering Mechanics β	EGM	17204	03	01	02	03	100		40	--		--	--	--	25@	10	
3✶	Applied Science – Physics	APH	17207	02	--	02	02	50	100	40	25@	50	20	--	--	--	--	
	Applied Science – Chemistry	ACH	17208	02	--	02	02	50			25@			--	--	--	--	
4	Construction Materials	CMA	17209	03	--	--	03	100		40	--		--	--	--	--	--	
5	Engineering Mathematics $	EMS	17216	03	01	--	03	100		40	--		--	--	--	--	--	
6	Development of Life Skills $	DLS	17010	01	--	02	--	--		--	--		--	25@	10	--	--	
7	Workshop Practice (Civil)	WPC	17012	--	--	04	--	--		--	--		--	--	--	50@	20	
	Total			**16**	**02**	**14**	**--**	**500**		**--**	**50**		**--**	**50**	**--**	**100**	**--**	**50**

Student Contact Hours Per Week: **32 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 750**

@ Internal Assessment, # External Assessment, ▭ No Theory Examination, $ - Common to all branches, β - Common to CE, ME,EE and CH Groups

Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, ,OR-Oral, TW- Term Work, SW- Sessional Work

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

✶ Applied Science is divided into two parts- Applied Science (Physics) and Applied Science (Chemistry). Theory examination of both parts as well as practical examination of both parts will be conducted on separate days. Sum of theory marks of both parts shall be considered for passing theory examination of Applied Science. Similarly it is also applicable to practical examination. It is mandatory to appear theory and practical examination of both parts. Remaining absent in any examination of any part will not be declared successful for that examination head.

✶ **Candidate remaining absent in examination of any one part of Applied Science subject i.e. Physics, Chemistry will be declare as Absent in Mark List and has to appear for examination. The marks of the part for which candidate was present will not be processed or carried forward.**

Course Name : All Branches of Diploma in Engineering & Technology

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

Semester : Second

Subject Title : Communication Skills

Subject Code : 17201

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:

In this age of globalization, competition is tough. Hence effective communication skills are important. Communication skills play a vital and decisive role in career development. The subject of Communication Skills introduces basic concepts of communication. It also describes the verbal, non-verbal modes and techniques of oral & written communication.

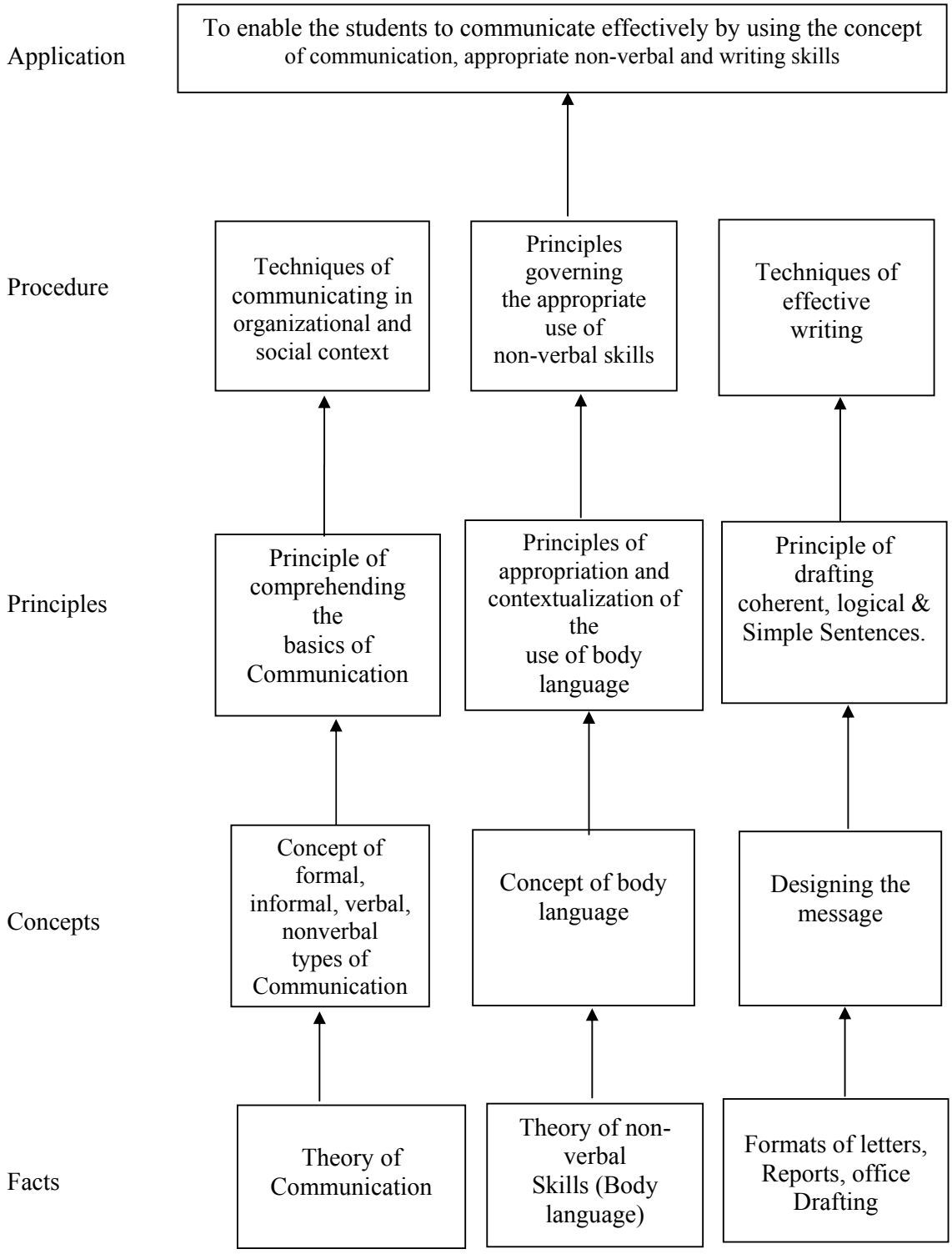
It will guide and direct to develop a good personality and improve communication skills.

General Objectives:

Students will be able to:

1. Utilize the skills necessary to be a competent communicator.
2. Select and apply the appropriate methods of communication in various situations.

Learning Structure:



Theory

Name of the Topic	Hours	Marks
Topic 01 - Introduction to Communication: **Specific Objective:** ➢ Describe the process of communication. **Contents:** • Definition of communication • Process of communication • Types of communication -- Formal, Informal, Verbal, Nonverbal, Vertical, Horizontal, Diagonal	**06**	**16**
Topic 02 - Effective communication **Specific Objective:** ➢ Identify the principles and barriers in the communication process **Contents:** ❖ Principles of communication. ❖ Barriers to communication a. **Physical Barrier**: ❖ Environmental (time, noise, distance & surroundings), ❖ Personal (deafness, stammering, ill-health, spastic, bad handwriting) b. **Mechanical** : Machine oriented c. **Psychological:** Day dreaming, prejudice, emotions, blocked mind, generation gap, phobia, status inattentiveness, perception. d. **Language** : Difference in language, technical jargons, pronunciation & allusions.	**08**	**20**
Topic 03 - Non verbal & Graphical communication: **Specific Objectives:** ➢ Effective use of body language & nonverbal codes ➢ View and interpret graphical information precisely. **Contents:** 3.1 Non- verbal codes: [08 Marks] • Proxemics, • Chronemics • Artefacts 3.2 Aspects of body language (Kinesics) [10 Marks] • Facial expression • Eye contact • Vocalics, paralanguage • Gesture • Posture • Dress & appearance	**08**	**28**

• Haptics 3.3 Graphical communication [10 Marks] • Advantages & disadvantages of graphical communication • Tabulation of data & its depiction in the form of bar graphs & pie charts.		
Topic 04 - Listening **Specific Objective:** ➢ Effective use of listening **Contents:** • Introduction to listening • Listening versus hearing • Merits of good listening • Types of listening. • Techniques of effective listening.	**02**	**08**
Topic 05 - Formal Written Communication **Specific Objectives:** ➢ Use different formats of formal written skills. **Contents:** • Office Drafting: Notice , memo & e-mail • Job application with resume. • Business correspondence: Enquiry letter, order letter ,complaint letter, adjustment letter. • Report writing: Accident report, fall in production, investigation report. • Describing objects & giving instructions	**08**	**28**
	32	**100**

Skills to be developed in practical:

Intellectual Skills:

1. Analyzing given situation.
2. Expressing thoughts in proper language.

Motor Skills:

1. Presentation Skills focusing on body language.
2. Interpersonal skills of communication

Journal will consist of following assignments:

01: Draw the diagram of communication cycle for given situation.

State the type and elements of communication involved in it.

02: Graphics:- a) Draw suitable bar-graph using the given data.
b) Draw suitable pie-chart using the given data.

03: Role play: Teacher should form the group of students based on no. of characters in the situation. Students should develop the conversation and act out their roles.

04: Collect five pictures depicting aspects of body language from different sources such as magazines, newspapers, internet etc. State the type and meaning of the pictures.

NOTE: The following assignments should be performed by using Language Software

05 Practice conversations with the help of software.

06 Describe people/personalities with the help of software and present in front of your batch.

07 Prepare and present elocution (three minutes) on any one topic with the help of software.

08 Describe any two objects with the help of software.

Learning Resources:

Sr. No.	Author	Title	Publisher
01	MSBTE, Mumbai.	Text book of Communication Skills.	MSBTE, Mumbai.
02	MSBTE, Mumbai.	CD On Communication Skills	MSBTE
03	Joyeeta Bhattacharya	Communication Skills	Reliable Series
04	Communication Skills	Sanjay Kumar, Pushpa Lata	Oxford University Press

Web Sites for Reference:

Sr. No	Website Address
01	Website: www.mindtools.com/page8.html-99k
02	Website: www.khake.com/page66htm/-72k
03	Website: www.BM Consultant India.Com
04	Website: www.letstak.co.in
05	Website: www.inc.com/guides/growth/23032.html-45k

Course Name : Civil, Chemical, Mechanical and Electrical Engineering Group

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

Semester : Second

Subject Title : Engineering Mechanics

Subject Code : 17204

Teaching and Examination Scheme:

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

In day to day life we come across different structures, at the time design of the structures analysis plays an important role. Perfect analysis is possible only when one known the types and effect of forces acting on the structure.

This subject provides knowledge about the different types of forces/loads their effects while acting in different conditions/systems. The subject also provides the knowledge about basic concepts of laws of engineering, their application to different engineering problem.

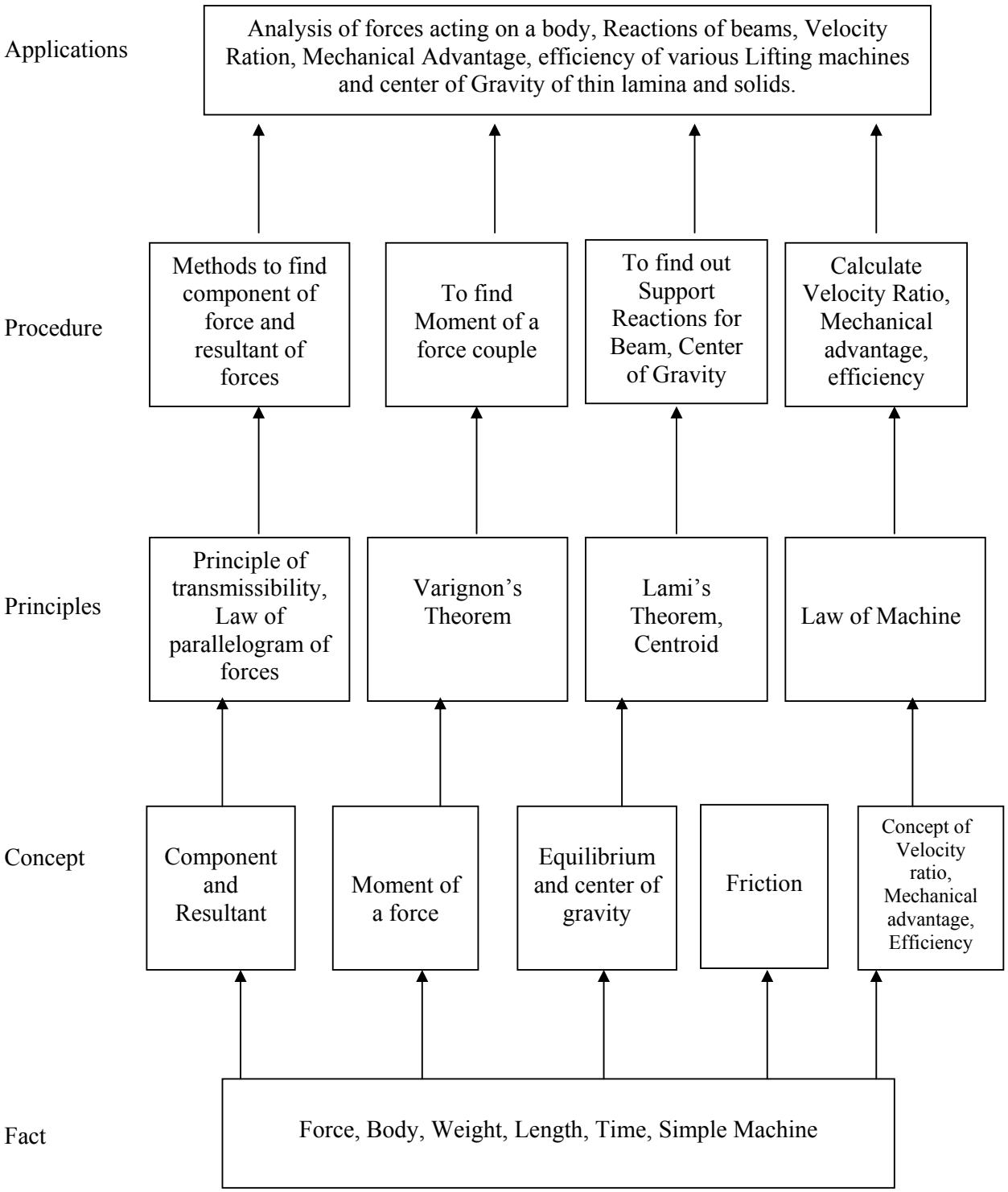
This subjects work as a prerequisite for future subjects such as MOS, SOM, DOS, TOM, DOM. Etc.

General Objectives:

The students will able to:

- Understand the effect of different types of coplanar forces.
- Apply Principles of equilibrium in finding reactions of different types of beams.
- Apply principles of equilibrium for locating centroid and centre of gravity for given solids.
- Understand working of different types of machines.

Learning Structure:



Theory

Topic and Contents	Hours	Marks
Topic 1: Simple Machines **Specific Objectives:** ➢ Calculate velocity ratio for given machine. ➢ Find Efficiency of given machine. **Contents:** 1.1 Definitions : ……..... (06 Marks) Simple machine, compound machine , load , effort , mechanical advantage , velocity ratio , input of a machine ,output of a machine efficiency of a machine , ideal machine, ideal effort and ideal load, load lost in friction, effort lost in friction. 1.2 Analysis : ……..... (04 Marks) Law of machine, maximum mechanical advantage and maximum efficiency of a machine, reversibility of a machine, condition for reversibility of a machine, self locking machine. Simple numerical problems. 1.3 Velocity Ratio for simple machines : ……..... (10 Marks) 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, calculation of mechanical advantage, efficiency, identification of type such as reversible or not etc.	**08**	**20**
Topic 2 : Force systems **Specific Objectives :** ➢ Define related terms in mechanics. ➢ Calculate Components of forces. **Contents:** 2.1 Fundamentals and Force systems: ……. (04 Marks) Definitions of mechanics, Engineering mechanics, statics, dynamics, Kinetics, Kinematics, rigid body, classification of force system according to plane coplanar and non coplanar ,sub classification of coplanar force system- collinear , concurrent, non concurrent, parallel, like parallel, unlike parallel, general etc. Definition of a force, S.I. unit of a force, representation of a force by vector and by Bow's notation method. Characteristics of a force, effects of a	**06**	**12**

force, principle of transmissibility. 2.2 Resolution of a force and Moment of a force: …….. (08 Marks) Definition, Method of resolution, along mutually perpendicular direction and along two given direction. Definition of moment, S. I. unit, classification of moments, sign convention, law of moments Varignon's theorem of moment and it's use, definition of couple, S.I. unit, properties of couple with example.		
Topic 3 : Composition of Forces **Specific Objectives:** ➢ Calculate resultant analytically for given force system. ➢ Calculate resultant graphically. **Contents:** 3.1 Analytical method: …… (10 Marks) Definition of Resultant force, methods of composition of forces, Law Of parallelogram of forces, Algebraic method for determination of resultant for concurrent and non concurrent, parallel coplanar force system. 3.2 Graphical method: ……... (10 Marks) Space diagram, vector diagram, polar diagram, and funicular polygon. Resultant of concurrent and parallel force system only.	**10**	**20**
Topic 4: Equilibrium **Specific Objectives:** ➢ State conditions of equilibrium for given force system. ➢ Calculate reactions of beams for different static loading. **Contents:** 4.1 Equilibrant and Lami's Theorem: ……. (12 Marks) Definition of equilibrant, relation between resultant and equilibrant, equilibrant of concurrent and non-concurrent force system. Analytical and graphical conditions of equilibrium for concurrent, non-concurrent and parallel force system, free body and free body diagram. Statement and explanation of Lami's theorem, Application of Lami's theorem for solving various engineering problems. 4.2 Beams:…… (08 Marks) Definition, Types of beams (cantilever, simply supported, overhanging, fixed, continuous), Types of end supports (simple support, hinged, roller), classification of loads, point load, inclined point load, uniformly distributed	**08**	**20**

load. Analytical method to determine reactions of simply supported, cantilever and over hanging beam subjected to point loads and UDL and graphical method to determine reactions for beams subjected to vertical point loads & udl only.		
Topic 5: Friction: **Specific Objectives:** ➢ Define terms related to friction. ➢ Apply conditions of equilibrium for forces acting on a body associated with friction. **Contents:** 5.1 Definition: …… (04 Marks) Friction, limiting frictional force, coefficient of friction, angle of friction, angle of repose, relation between angle of friction, angle of repose and coefficient of friction. Cone of friction, types of friction, laws of friction, advantages and disadvantages. 5.2 Equilibrium of body on Horizontal and inclined plane:……. (08 Marks) Equilibrium of body on horizontal plane subjected to horizontal and inclined force. Equilibrium of body on inclined plane subjected to forces applied parallel to the plane only. Concept of ladder fraction.	**08**	**12**
Topic 6 : Centroid and Centre Of Gravity: **Specific Objectives:** ➢ Calculate centroid of composite plain figures. ➢ Calculate centre of gravity of composite solids. **Contents:** 6.1 Centroid:……. (08 Marks) 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 figure with not more than three geometrical figures. 6.2 Center of gravity:…… (08 Marks) Definition, center of gravity of simple solids such as cylinder, sphere, hemisphere, cone, cube, and rectangular block. Centre of gravity of composite solids with not more than Two simple solids. (Hollow solids are not expected.)	**08**	**16**
Total	**48**	**100**

Practicals:

Skills to be developed:

Intellectual Skills:

- Understand the forces acting on given structure.
- Interpret the results.

Motor Skills:

- Handle the equipment effectively.
- Draw graph for different relationships.

The term work consists of experiments from Group A and graphical solutions from Group B

Group A: To find MA, VR, Efficiency, Ideal Effort, Effort lost in friction for various loads and establish law of machine. Calculate maximum efficiency and also check the reversibility of machines(Sr no. 1 to 4) :

1) Differential axle and wheel.
2) Single purchase crab or Double purchase crab
3) Weston's differential pulley block or worm geared pulley block
4) Simple Screw jack.
5) Verify law of moments.
6) Verify law of polygon of forces.
7) Verify of Lami's theorem.
8) Verify the Equilibrium of parallel forces – simply supported beam reactions.
9) Compare coefficient of friction on horizontal plane and inclined plane for the same surface.

Group B: Graphical solutions for the following on A4 Size Graph Paper.

1) Concurrent force system : Two problems
2) Parallel force system : Two problems
3) Reactions of beam : Two problems

List of Tutorials:

Form a group of five students. Each group shall be allotted three different types of problems on the following topics. Problems shall be submitted in separate note book. Teacher shall provide the feedback to the students on the submitted tutorials.

1. Calculation of M.A., V.R, Efficiency, law of machine for Simple machine.
2. Numerical on resolution of force/ Moment of force.
3. Calculation of resultant for different force system.
4. Numerical on law of parallelogram of forces.
5. Numerical on applications of Lami's Theorem.
6. Calculation of Reactions of beam subjected point load, UDL and inclined load.
7. Numerical on Friction body resting on horizontal Plane.
8. Numerical on Friction body resting on Inclined Plane.
9. Numerical on centroid of composite figures.
10. Numerical on centre of gravity of composite Solids.

Learning Resources:

1. **Books:**

Sr. No.	Author	Title	Publisher
01	R.S.Khurmi	Engineering Mechanics	S. Chand & Company Ltd.
02	Shames and Rao	Engineering Mechanics	Pearsion Education.
03	R.C.Hibbeler	Engineering Mechanics	Pearsion Education.
04	S. Ramamruthum	Applied Mechanics	Dhanpat Rai & Sones, Delhi.
05	S Rajasekaran	Essentials of Engg. Mech.	Vikas Publishing House Pvt. Ltd

2. **Cds, PPTs Etc:**
3. **IS, BIS and International codes:**
4. **Websites:**
5. **Implementation Strategy:**
6. **List of laboratory equipments :**

Course Name : Civil Engineering Group

Course Code : CE/CS/CR/CV

Semester : Second

Subject Title : Applied Science (Physics)

Subject Code : 17207

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
02	--	02	02	50	25@	--	--	75

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)**
- **Applied Science is divided into two parts - Applied Science (Physics) and Applied Science (Chemistry). Theory examination of both parts as well as practical examination of both parts will be conducted on separate days. Sum of theory marks of both parts shall be considered for passing theory examination of Applied Science. Similarly it is also applicable to practical examination. It is mandatory to appear theory and practical examination of both parts. Remaining absent in any examination of any part will not be declared successful for that examination head**.

Rationale:

Applied physics is a powerful instrument in engineering & technology. It is an important subject for mechanical engineering group courses

The topics on Rectilinear and Angular motion, kinetics and work power energy will be useful in understanding concepts of motion, velocity, impulse and applications such as recoil of gun, motion of lift, potential, kinetic energy, torque etc.

The topics on projectile and circular motion will be useful in various applications in civil, engineering field.

The topics on non destructive testing will be useful in testing various materials used in the civil, mechanical and automobile engineering field.

The topics on acoustics are useful for the students of civil engineering while designing auditoriums, lecture hall etc. Indoor lighting is necessary in architecture and interior design of a hall.

Principle of Photocell and its applications are required in study of solar cells, photovoltaic cells. The study of this subject matter will make the student versatile, innovative, & sound base for engineering studies & research work in technical field.

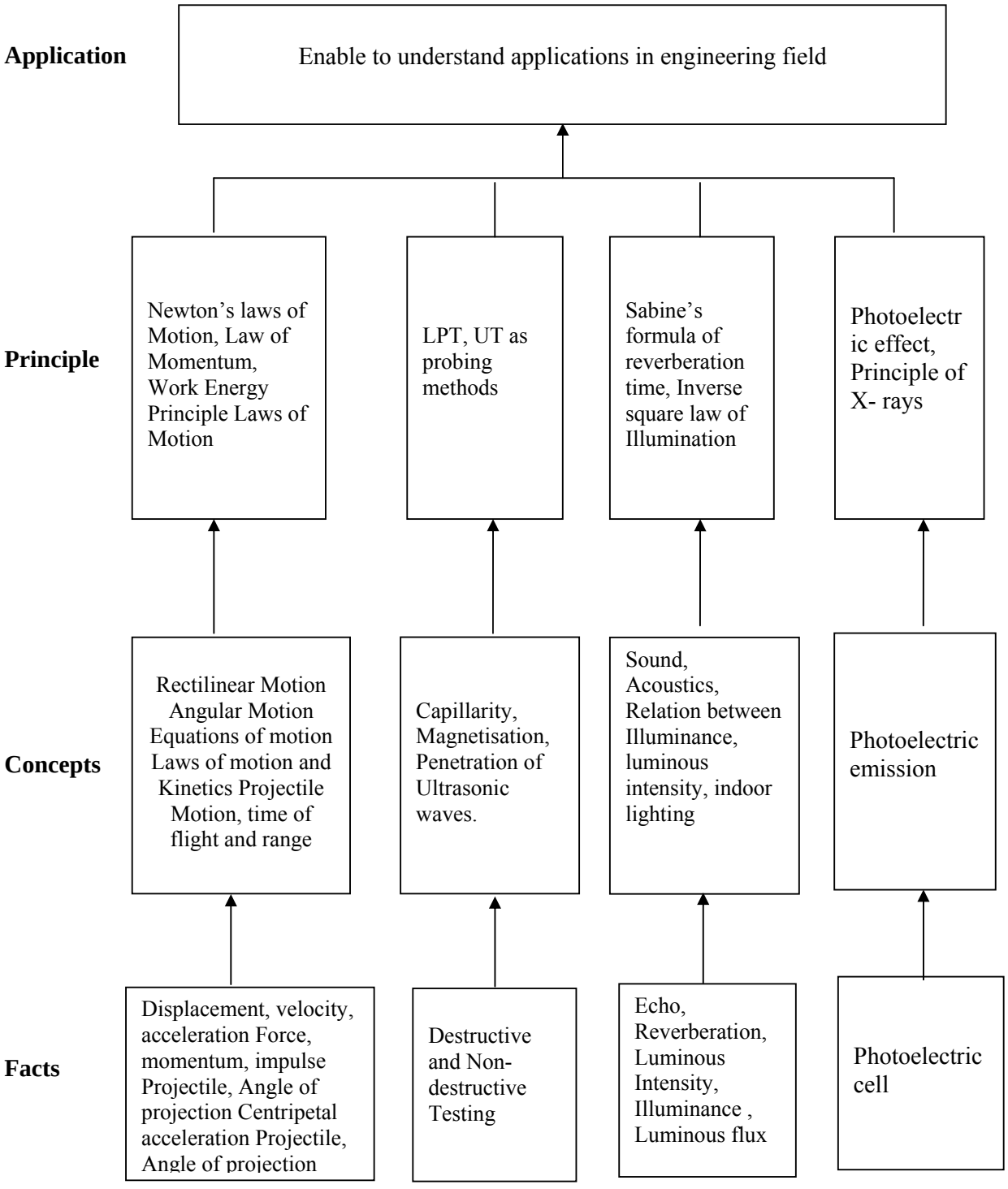
General Objectives.

Students will able to.

1. Understand equations of motion and their applications.
2. Differentiate kinetic and kinematics and solve the problems on kinematics and kinetics.
3. Understand Ultrasound and its applications
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 and indoor lighting.
8. Differentiate between Centripetal and Centrifugal force.

Learning Structure:



Applied Physics (Civil Engineering Group) Theory:

Topics and contents	Hours	Marks
Topic 1] Motion **Specific Objectives:** ➢ State equations of motion. ➢ Apply laws of motion to solve problems. ➢ Differentiate between linear and circular motion, ➢ State meaning of centripetal acceleration, centripetal force, **1. 1 Rectilinear and Angular Motion [06 Marks]** • Equations of motion:-V=u+at, $S=ut+1/2at^2$, $V^2=u^2+2as$ (no derivation), distance traveled by particle in n^{nt} second, (only equation), Uniform velocity, uniform acceleration and uniform retardation, equations of motion for motion under gravity. • Definition of angular displacement, angular velocity, angular acceleration, relation between angular velocity and linear velocity, three equations of angular motion (no derivation) angular distance traveled by particle in n^{nt} second (only equation). **1.2 Kinetics and Work Power Energy [06 Marks]** • Definitions of momentum, impulse, impulsive force with formulae, statements of Newton's laws of motion with equations, applications of laws of motion—recoil of gun. • Definition of work, power and energy, equations for potential energy. kinetic energy, work -energy principle. **1.3 Projectile Motion and circular motion [04 Marks]** • Definition of a projectile motion, angle of projection, trajectory, time of flight and range with formulae. • Definition of a circular motion, centripetal acceleration, centripetal force, definition of centrifugal force, and its applications.	**10**	**16**
Topic 2] Nondestructive Testing of materials. **Specific Objectives:** ➢ Describe the method of production of ultrasonic waves ➢ Use NDT methods for quality testing of materials in industry **2.1 Ultrasonic [04 Marks]** • Ultrasonic waves-properties, production of ultrasonic waves by piezoelectric method **2.2 Non –destructive testing methods [06 Marks]** • Destructive and Nondestructive testing, advantages of NDT, limitations of N.D.T., different N.D.T. Methods used in industries, criteria for selection of NDT method, Liquid penetration Testing (LPT): principle, procedure and applications, Ultrasonic testing methods:-principle, procedure and applications.	**06**	**10**
Topic 3] Acoustics and Indoor lighting: **Specific Objectives:** ➢ Find the Conditions for good acoustics ➢ Determine factors affecting acoustical planning of auditorium ➢ Apply Inverse square law of photometry ➢ Find working and applications of Bunsen's photometer **3.1 Acoustics: [06 Marks]** • Echo, reverberation, standard reverberation time, Sabine's formula, conditions for good acoustics, factors affecting acoustical planning of	**08**	**12**

auditorium. **3.2 Indoor lighting: [06 Marks]** • Definition of luminous intensity, intensity of illumination with their SI units, inverse square law of photometry, Bunsen's photometer - ray diagram, working and applications, need of indoor lighting, indoor lighting schemes and factors affecting indoor lighting.		
Topic 4]: Modern physics. **Specific objectives:** ➢ Derive Planck Einstein equation ➢ State the concept of photocell ➢ State applications of X - ray **4.1 Photo electricity: [06 Marks]** • Photon (quantum), Plank**'s** hypothesis, energy of photon**,** properties of photons. • Photo electric effect: Circuit diagram, process of photoelectric emission, definitions:-threshold frequency, threshold wavelength, stopping potential, characteristics of photoelectric effect • Work function, Einstein's photoelectric equation, photo resistor (LDR) – symbol, principle, applications, photoelectric cell:-principle, applications. **4.2 X-rays: [06 Marks]** • Origin of X-rays, production of X-rays using Coolidge's X-ray tube, minimum wavelength of X-ray, properties of X-rays, applications of X- rays: engineering, medical and scientific.	**08**	**12**
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.
- Verify the principles, laws, using given instruments under different conditions.
- Read and interpret the graph.
- Interpret the results from observations and calculations.
- Use these results for parallel problems.

Motor Skills:

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

List of Experiments:

Sr No	Title of Experiment	To be performed by a group of
1	Determine the radius of spherical surface using spherometer	2 **Students**
2	Find refractive index of prism by using spectrometer	4 to 5 **students**
3	Calculate coefficient of absorption for acoustical materials	2-3 **students**
4	Compare luminous intensities of two luminous bodies by using Bunsen's photometer	4 to5 **students**
5	Verify characteristics of photoelectric cell.	4 to5 **students**
6	Calculate coefficient of linear expansion of a metal rod using Pullinger's apparatus.	2 to 3 **students**
7	Determine velocity of sound by resonance tube.	4 to5 **students**
8	Determine rigidity modulus of given wire using torsional pendulum.	2 to3 **students**
9	Calculate acceleration due to gravity using compound bar pendulum	4 to5 **students**

Learning resources:

1. **Books:**

Sr. No.	Title	Author	Publisher
01	Engineering Physics	by R.K.Gaur and S.L.Gupta	Dhanpat Rai Publication, New Delhi.
02	Fundamental of Physics	Resnick and Hailday	Wisley Toppan Publishers – England
03	Engineering Physics	V. Rajendran	Tata McGraw-Hill Publications
04	Engineering Physics	K. Rajgopal	PHI learning pvt ltd. New Delhi
05	Physics- Std XI, Std XII	-	HSC board/c CBSE Board
06	Conceptual Physics	P.G.Hewitt	Pearson Education, Tenth edition
07	A text book of engineering Physics	M.N. Avadhanulu P.G. Kshirsagar	S.Chand & co. Ltd

2. Websites:

http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html
http://physics.info
http://physics.org
http://about.com
http://classroom.com
http://101science.com

3) Videos:

http://www.youtube.com/watch?v=ZmhuCIL5BqQ: work power energy
http://www.youtube.com/watch?v=8kOSth5QgF4: motion in one dimension, rectilinear motion
http://www.youtube.com/watch?v=SsIaL3L6Jg4: projectile motion
http://www.cmslaser.com

4) CD:

Educational Cd of NCERT
Educational cd of Pearson education India

5) PPT:

PPT www.dboccio.com/Physics%20PowerPoints/Work,%20Energy,
www.khanacademy.com

Course Name : Civil Engineering Group

Course Code : CE/CS/CR/ CV

Semester : Second

Subject Title : Applied Science (Chemistry)

Subject Code : 17208

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
02	--	02	02	50	25@	--	--	75

NOTE:

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

Study of Applied Chemistry is essential to Civil Engineering course. It provides knowledge of chemical properties of materials and selection of appropriate material for specific applications in the field of engineering.

Study of impurities and hardness in water, chemical reactions involved, sewage water and methods for water softening and purification will help the students to make proper use of water.
The study of extraction of iron, heat treatment method to improve mechanical properties of iron without changing its chemical composition, different alloys of iron are also useful in mechanical engineering application. Study of composition and properties of cement and lime useful in their application in construction of structures. The organic coatings like paints are the materials of decoration as well as protection. Their study will help the student to apply correct methods for preserving the machines and structures.

The contents of this subject are designed to enhance student's capabilities in managing the given task and in solving challenging problems in the field of civil engineering. The subject will generate curiosity of carrying out further development in all engineering fields.

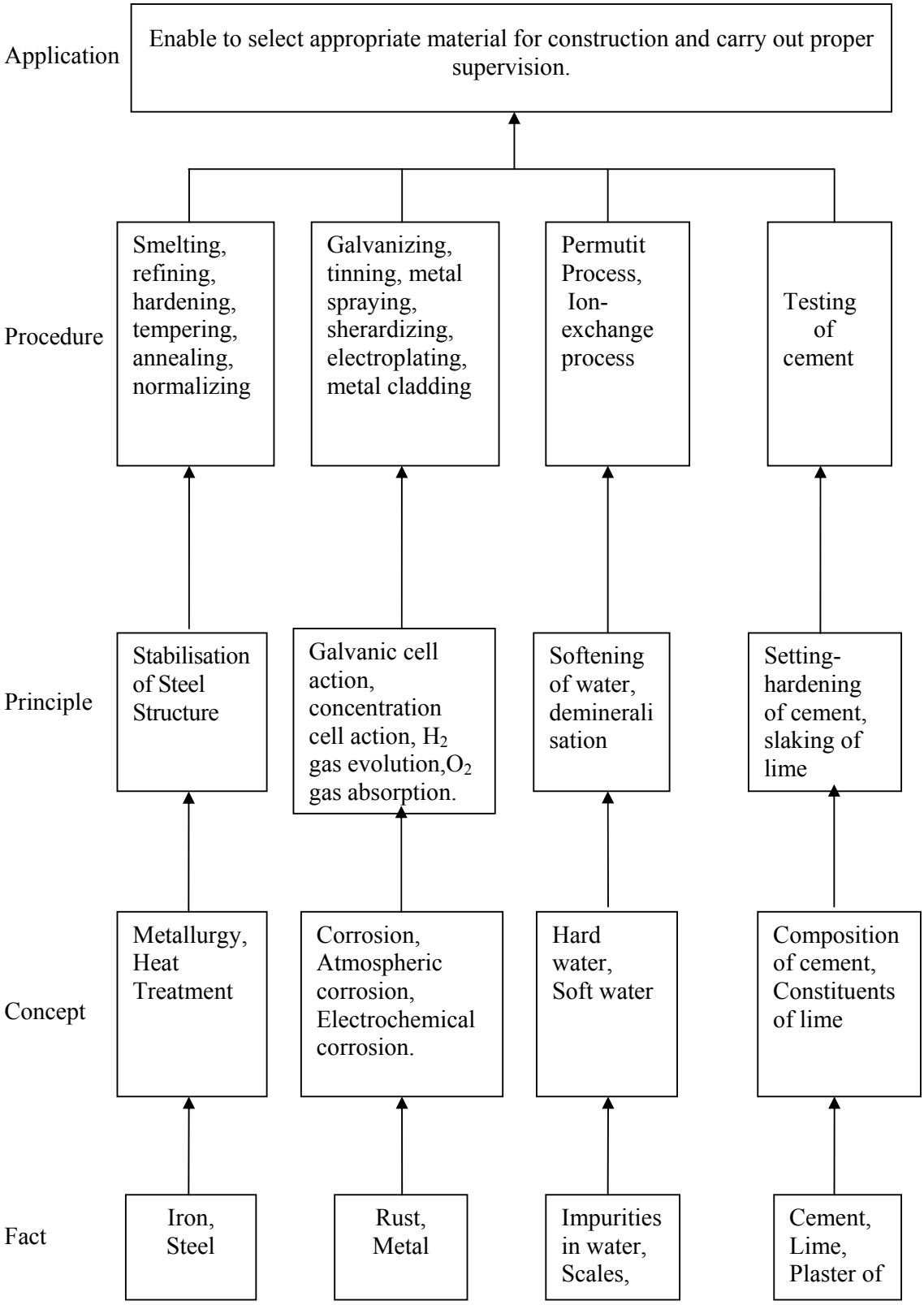
General Objectives:

The student will be able to

1. Know appropriate materials while using in construction.
2. Apply knowledge to enhance operative life span of construction material and structure by various protective methods.
3. Understand setting and hardening processes of cement and lime.
4. Understand appropriate method to protect the machines and structures from corrosion.

5. Know methods of water purification.

Learning Structure:



Theory content:

Topic and Contents	Hours	Marks
Topic:1] Metallurgy: **Specific Objectives:** ➢ Explain the process of extraction of iron from its ore. ➢ Explain different processes of heat treatment. ➢ State effects of alloying elements on properties of steels. **1.1Metallurgy: [6 Marks]** • Definitions of metallurgy, ores of iron. • Extraction of pig iron by smelting in Blast furnace with chemical reactions in different zones, products of blast furnace- composition, properties and applications of pig iron, slag and flue gases. • Properties and applications of commercial forms of iron- pig iron, cast iron, wrought iron. **1.2 Steels: [6 Marks]** • Definition of steel, preparation of steel from pig iron using open hearth process, basic oxygen process. • Classification of plain carbon steel- low carbon, medium carbon, high carbon steels with their properties and applications. • Heat Treatment of steels: Definition and purposes of -hardening, tempering, annealing, normalizing.	**08**	**12**
Topic 2] Corrosion: **Specific Objectives:** ➢ Explain Mechanism of atmospheric corrosion and immersed corrosion. ➢ Describe different methods of protection of metal from corrosion **2.1 Corrosion : [6 Marks]** • Corrosion, Types of corrosion: • Atmospheric Corrosion: Definition, mechanism of oxidation corrosion, types of oxide films and their significance, factors affecting rate of atmospheric corrosion. • Immersed Corrosion: Definition, mechanism of immersed corrosion by galvanic cell action- with evolution of hydrogen gas and absorption of oxygen gas, factors affecting immersed corrosion. **2.2 Protection of metals by: [8 Marks]** • Modification of environment, modification of properties of metal, electrochemical protection by sacrificial anodic protection and impressed current cathodic protection, use of protective coatings. • Application of metallic coatings: By galvanising, tinning, metal spraying, electroplating, metal cladding and cementation- sherardizing, chromising, colourising. • Application of non-metallic coatings: paint-definition, characteristics, constituents of paint and their functions.	**10**	**14**
Topic 3] Water: **Specific Objectives:** ➢ State the causes of hardness of water. ➢ Describe the method for removing hardness from water. **3.1 Hardness of water: [10 Marks]** • Types of impurities in natural water. • Definitions of hard and soft water, causes of hardness, types of	**10**	**18**

hardness, definition and degree of hardness, in ppm and equivalents of $CaCO_3$, estimation of hardness by EDTA method, Numericals. • Adverse effects of hard water in: - Industries: paper industry, textile industry, dyeing industry, sugar industry. - Domestic applications: washing, bathing, cooking, drinking. - Boilers: boiler corrosion, caustic embrittlement, scale and sludge formation. **3.2 Water treatment: [8 Marks]** • For industrial applications: Principle, diagram, working, chemical reactions, regeneration, advantages-Permutit / Zeolite process and Ion exchange process • For domestic applications: Water quality parameters for potable water, treatment of water for domestic application by screening, sedimentation, coagulation, filtration, sterilization. • Chlorination method of sterilization- using chlorine gas, bleaching powder, chloramines. • For sea water: Desalination of sea water by reverse osmosis.		
Topic 4] Cement and Lime: **Specific Objectives:** ➢ Select appropriate materials used in construction. ➢ Understand properties of cement and lime. **4.1 Cement : [4 Marks]** • Portland cement: Definition, chemical composition, average compound composition, functions of constituents. Setting and hardening of Portland cement with chemical reactions, function of gypsum in cement. • Special Cements: Properties and application of water proofing cement, super sulphate cement, plaster of paris. • Mortar and Concrete: Definition, formation, properties and applications. **4.2 Lime** : **[2 Marks]** • Definition, formation, properties and uses of quick lime, slaked lime, hydrated lime. • Classification of lime: Composition, properties and uses of fat lime, lean lime.	**04**	**06**
Total	**32**	**50**

Practicals:

Intellectual Skills:

1. Select proper equipments and instrument
2. Interpret the results.
3. Plan the set up of the experiment.
4. Verify the characteristics of materials.

Motor Skills:

1. Handle various laboratory reagents.
2. Measure chemicals accurately.
3. Observe the completion of reaction.
4. Note down readings.
5. Follow systematic procedure step by step.

List of Experiments:

Sr. No.	Name of the experiment.
1	Determine the percentage of iron in given Steel sample by redox titration.
2	Find the relation between loss in weight of aluminium strip in acidic and alkaline medium and rate of corrosion.
3	Determine electrode potential of various metals to study their tendency towards corrosion.
4	Determine the strength of given hydrochloric acid solution by titrating it against sodium hydroxide solution by using pH meter.
5	Determine thinner content in paint.
6	Determine total hardness (permanent and temporary) of given sample of water by EDTA method.
7	Determine chloride content in given sample of water by Mohr's method.
8	Determine the alkalinity of given sample of water.
9	Determine the percentage of calcium content in cement.

Learning Resources:

1. Reference books:

Sr. No.	Author	Name of the book	Publisher
1	Jain and Jain	Engineering Chemistry	Dhanpat Rai and Sons
2	S. S. Dara	Engineering Chemistry	S. Chand Publication
3	B Sivasankar	Engineering Chemistry	The McGraw Hill Companies
4	R. Sivkumar, N. Sivkumar	Engineering Chemistry	The McGraw Hill Companies
5	K.B. Chandrasekhar, U. N. Das, Sujatha Mishra	Engineering Chemistry	SCITECH
6	B. K. Sharma	Industrial Chemistry	Goel Publication

2. List of web sites, Videos and animations:

en.wikipedia.org/wiki/Hard_water
www.treat-water.com/waters-impurity.pdf
www.mrwa.com/OP-Water%20and%20Impurities.pdf
en.wikipedia.org/wiki/Cement www.scribd.com/.../Setting-and-Hardening-Concrete
www.ustudy.in/node/1383
en.wikipedia.org/wiki/Carbon_steel
www.asminternational.org/content/ASM/StoreFiles/ACF180B.pdf
www.namedorganicreactions.co.uk/Corrosion.pdf
http://www.ausetute.com.au/corrosion.html
http://www.youtube.com/watch?v=8s8rcnxqLIw
http://www.galvanizeit.org/aga/animation/4728?keepThis=true&TB_iframe=true&height=480&width=640 (Galvanizing)
http://www.ehow.com/list_6725219_different-types-metal-cladding.html (Metal Clading)
http://www.sherardizing.com/resources/files/9_Sherardizing_Corrosion.pdf (Sheradizing)

Course Name : Civil Engineering Group

Course Code : CE/CS/CR/CV

Semester : Second

Subject Title : Construction Materials

Subject Code : 17209

Teaching and Examination Scheme:

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

NOTE:

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

Rationale:

The basic concern of a civil engineer is the design, construction, supervision and maintenance of structures such as building, bridges, canals, water tanks, roads etc. A most important aspect infield practice is to select and use different types of materials. Thus in the field of civil engineering, construction materials play a vital role in the quality and aesthetics of the structure. With the advancement of technology, new materials are invented and incorporated to a greater extent in the field of construction.

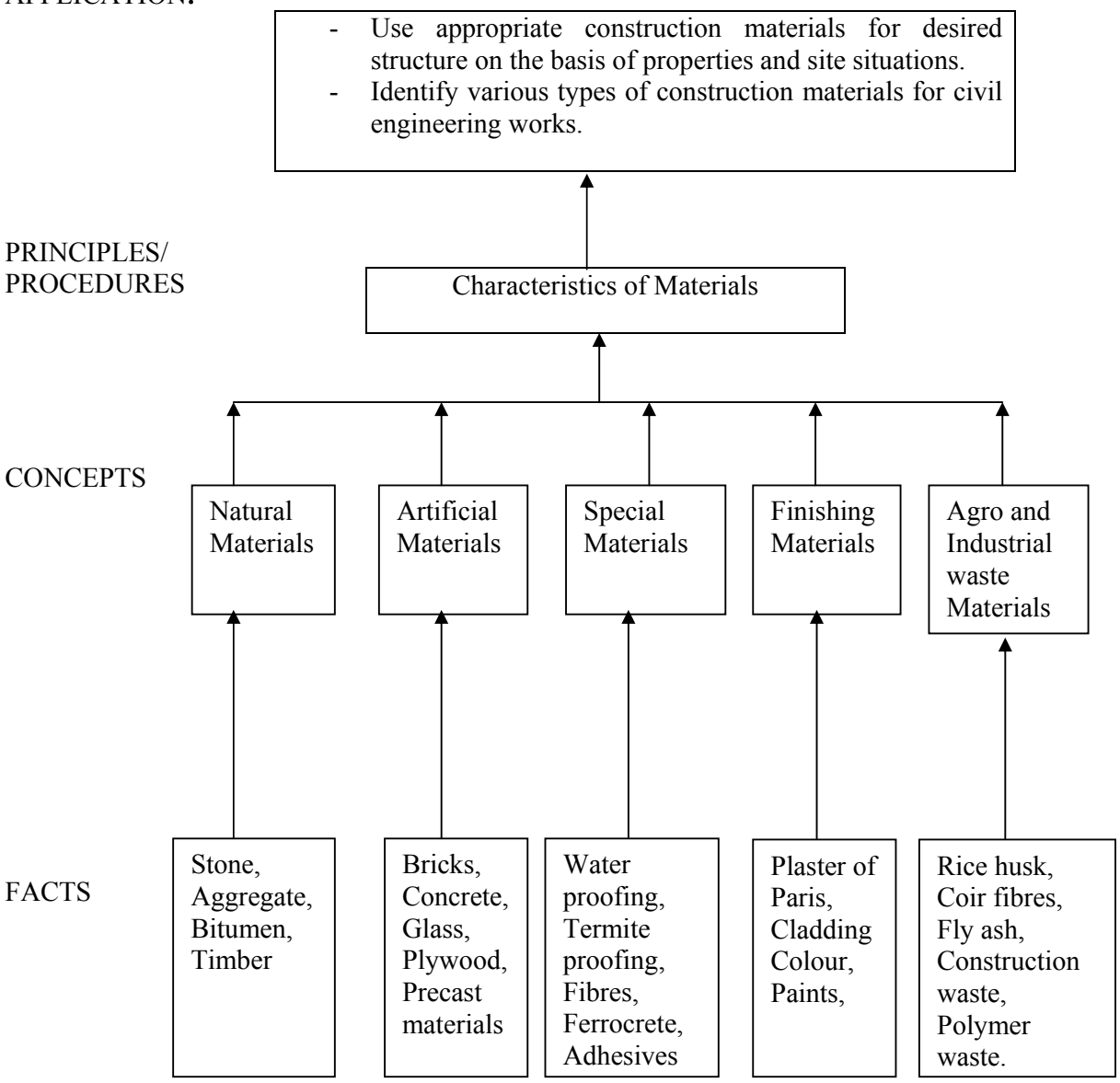
The construction material can be classified as natural, artificial, special, finishing and recycled types. Properties, applications and market study of these, provide the guidance to recommend the use of these materials for various civil engineering structures.

General Objectives:

Student will be able to:

1. Know various construction materials required for Civil Engineering construction.
2. Understand the properties/characteristics of various construction materials.
3. Know the applications of various construction materials in Civil Engineering Construction.

Learning Structure:



Theory:

Topic and Contents	Hours	Marks
Topic – 1 Over view of Civil Engineering **Specific Objectives:** ➢ State criteria for selection of construction materials. ➢ Classify various construction materials. **Contents:** • Role of Civil Engineering in human life - Building Construction, Transportation Engineering, Environmental Engineering, Irrigation Engineering, Construction Management. (applications only) • Criteria for Selection of construction materials on the basis of carrying prescribed load, serviceability, Aesthetically pleasing, economical, environmental friendly. • Broad classification of materials – Natural, Artificial, Special, Finishing and Recycled construction materials.	**04**	**08**
Topic- 2. Natural Construction Materials **Specific Objectives:** ➢ Classify various Natural construction materials ➢ State various properties of Natural construction materials ➢ List applications of Natural construction materials **Contents :** **2.1 ----------(12)** • Stone – Physical Classification of rocks; Requirements of good building stone, characteristics of stone, Quarrying and dressing of stone. • Timber – Timber as construction material, structure of timber, properties of good timber, seasoning of timber, defects in timber. **2.2 ----------(12)** • Bituminous materials and mixtures: Terminology, different types of asphalt, bitumen, tar used in Civil Engineering works, their properties and uses • Lime – Manufacture of lime, classification, field slaking of lime and properties of lime • Soil –terminology- sand, silt, clay and their suitability in construction work.	**10**	**24**
Topic - 3 Artificial Construction Materials **Specific Objectives:** ➢ List various artificial construction materials. ➢ State functions of various components of cement Plant. ➢ Describe applications of artificial construction materials. **Contents :** **3.1 ----------(10)** • Bricks – Brick earth and its constituents. Conventional bricks and Standard bricks. Characteristics of good brick, Classification of burnt clay bricks and their suitability, special bricks. Manufacturing	**14**	**30**

of burnt clay bricks. Common Field tests on Bricks- shape and size, colour, sound, hardness test, finger scratch test, water absorption test • Tiles –flooring and roofing tiles. Characteristic of good tiles, different types of tiles depending upon material used, sizes of tiles, uses of tiles, wall cladding **3.2 ----------(10)** • Materials for making concrete-: Cement – definition, Manufacturing of cement, types of cements – ordinary Portland, white cement colour cement and their suitability. Different brand name of cement, common pickings available in markets, common field tests on cement- lumps visible, colour, hand feeling , water float test Aggregate – Definition, types of aggregate - coarse aggregate, fine aggregates (size). Artificial sand – properties and advantages, suitability • Pre cast concrete products – concrete blocks- hollow, solid concrete blocks, pavement blocks, balustrades, their properties and uses. **3.3 ----------(10)** • Plywood, particle board and veneers their properties and uses. • Glass – properties- thickness and weight, thermal conductivity, light and heat translation, durability sound insulation, types of glass- soda lime glass, lead glass and borosilicate glass. Glass used for cladding.		
Topic - 4 Special Construction Materials **Specific Objectives:** ➢ List various Special construction materials ➢ State various properties of Special construction materials ➢ State applications of Special construction materials **Contents** **4.1 ----------(10)** • Water proofing and damp proofing materials – Brand names, packings available properties and uses. • Termite proofing materials -need ,names and uses • Thermal insulating materials- properties, names and situations where used • Sound insulating materials- properties, names and situations where used **4.2 ----------(10)** • Fibres – Types –Jute, Coir, Steel Fibres, Carbon Fibres, Glass Fibres, Plastic Fibres, Asbestos Fibres properties and uses • Miscellaneous materials – artificial timber, ferrocrete, adhesives, epoxy and Geosynthetic materials, ceramic materials -properties and uses.	**08**	**20**
Topic - 5. Finishing Materials **Specific Objectives:** ➢ List various finishing materials ➢ State various properties of finishing materials ➢ State applications of finishing materials **Contents**	**06**	**08**

• Plastering Materials – Mortars: Lime Mortar, Cement Mortar, Special Mortars – Properties, proportion, situations where used • Plaster of Paris – Constituents, properties and uses POP finishing boards, sizes, purpose. • Paints, Distempers and Varnishes – types, properties and uses. • Cladding materials – properties, names of different cladding materials and uses. • Linoleum- properties, sizes, use, method of fixings to floor		
Topic -6 Building materials from Agro and Industrial wastes **Specific Objectives:** ➢ List various Agro and Industrial wastes used in construction ➢ State various properties of Agro and Industrial wastes as a construction materials ➢ State applications of Agro and Industrial wastes as a construction materials **Contents** • properties and uses of -: Rice husk, Bagasse, coir fibres, straw, coconut and Areca nut tree trunks, coconut leaf, Fly ash, Blast furnace slag, Granite and marble polishing waste, construction waste, Sawdust, Plastic, Polymer, rubber waste.	**06**	**10**
Total	**48**	**100**

Note: Two field visits shall be arrange to show various recent buildings materials, student shall observe those materials, see sizes, packing, market rates, special characteristics and submit two three pages report.

Learning Resources

1. Books

Sr. No.	Title	Author	Publisher
1	Civil Engineering Materials	Shan Somayaji	Pearson
2	Building construction illustrated	Francis D.K. Ching	Wiley India
3	Olin's Construction Principles, materials and methods	H Leslie Simmons	Wiley India
4	Elements of civil Engineering	Anurag Kandya	Charotar
5	Building materials Technology	L Reed Brantley	Tata McGraw – Hill
6	Engineering Materials	Sharma	PHI Publication
7	Civil Engineering Materials	NITTTR Chandigarh	NITTTR Chandigarh
8	Construction Materials	D. N. Ghose	Tata McGraw – Hill
9	Building Materials	S. K. Duggal	New International

2. Materials museum- Collect the samples and display for the followings-

Stone, aggregate of different sizes, timber, lime, bitumen, Bricks, tiles, precast concrete products, Water proofing, Termite proofing, Thermal insulating, plaster of Paris, paints, distemper, and varnishes.

Also display of various leaflets of recent building materials.

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 : 17216

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:

This subject is an extension of Basic mathematics of first semester and a bridge to further study of applied mathematics. The knowledge of mathematics is useful in other technical areas.

Differential calculus has applications in different engineering branches. For example concepts such as bending moment, curvature, maxima and minima.

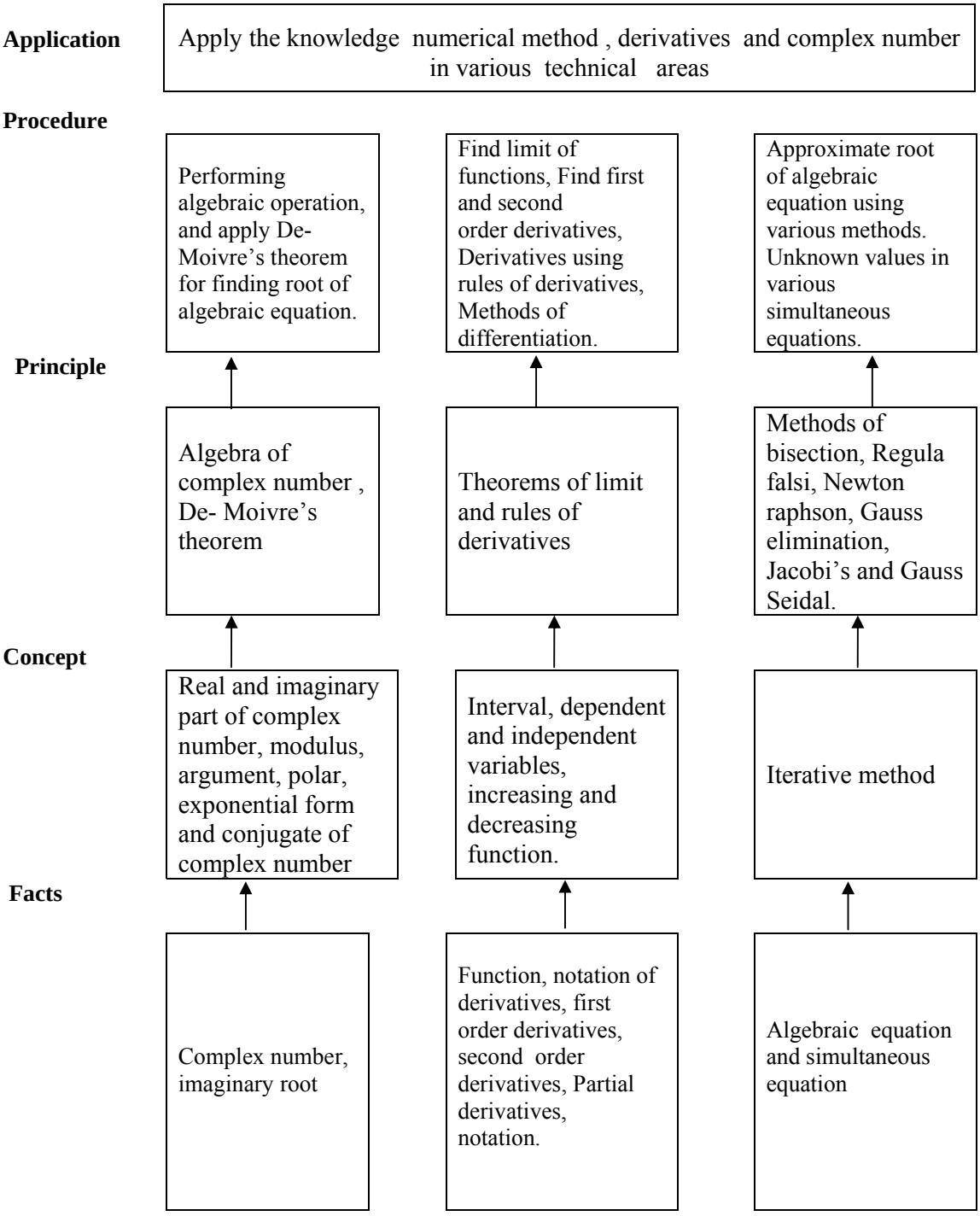
Numerical methods are used in programming as an essential part of computer engineering. For solution of problems in electrical circuits and machine performances complex number is used engineering mathematics lays the foundation to understand technical principles in various fields.

General objectives:

Student will be able to

1) Use complex numbers for representing different circuit component in complex form to determine performance of electrical circuit and machines.
2) Apply rules and methods of differential calculus to solve problems.
3) Apply various numerical methods to solve algebraic and simultaneous equations.

Learning Structure:



Content Theory:

Topic	Hours	Marks
Topic 1 - Complex number		
1.1 Complex number ---------- 14 **Specific objectives :** ➢ Find roots of algebraic equations which are not in real. • Definition of complex number, Cartesian, polar and exponential forms of complex number. • Algebra of complex number such as equality, addition, subtraction, multiplication and division. • De- Moivre's theorem with simple examples. • Euler's form of circular functions, hyperbolic functions and relation between circular and hyperbolic functions.	**08**	**14**
Topic 2 - Differential Calculus		
2.1 Function ---------- 14 **Specific objectives :** ➢ Identify the function and find the value of function. • Definition of function, range and domain of function. • Value of function at a point. • Types of functions and examples.	**08**	**58**
2.2 Limits ---------- 20 **Specific objectives :** ➢ To evaluate limit of function. • Concept and definition of limit. • Limits of algebraic, trigonometric, logarithmic and exponential functions with examples.	**08**	
2.3 Derivatives ---------- 24 **Specific objectives :** ➢ Find the derivatives by first principle. ➢ Solve problems using rules and methods of derivatives • Definition of derivatives, notation, derivatives of standard function using first principle. • Rules of differentiation such as, derivatives of sum or difference, product, and quotient with proofs. • Derivative of composite function with proof (Chain rule) • Derivatives of inverse trigonometric functions using substitution • Derivatives of inverse function. • Derivatives of implicit function. • Derivatives of parametric function. • Derivatives of one function w.r.t another function. • Logarithmic differentiation. • Second order differentiation.	**12**	
Topic 3 - Numerical Method		
3.1 Solution of algebraic equation ---------- 14 **Specific objectives :** ➢ Find the approximate root of algebraic equation. • Bisection method • Regula falsi method • Newton Rapshon method	**06**	**28**

3.2 Numerical solution of simultaneous equations ---------- 14 **Specific objectives :** ➢ Solve the system of equations in three unknowns. • Gauss elimination method • Jacobi's method • Gauss Seidal method	**06**	
Total	**48**	**100**

Tutorials:

1) Tutorial are to be used to get enough practice.
2) In each tutorial make a group of 20 student students and for each group minimum 10 problems are to be given.

List of Tutorials:

Sr No.	Topic for Tutorial
1	Complex number (Examples based on algebra of complex numbers)
2	Complex number (Examples based on De Moivre's theorem and Euler's formulae)
3	Function
4	Limit (algebraic and trigonometric functions)
5	Limit (logarithmic and exponential functions)
6	Derivatives by first principle
7	Derivatives (Examples based on formulae of standard functions and rules)
8	Derivatives (Examples based on methods of differentiation)
10	Solution of algebraic equations
11	Solution of simultaneous equations

Learning Resources:

1) Books:

Sr. No.	Title	Authors	Publication
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 Publication, New Delhi
5	Higher Engineering Mathematics	B. S .Grewal	Khanna Publication, New Delhi
6	Applied Mathematics	P. N. Wartikar	Pune Vidyarthi Griha Prakashan, Pune

2) Websites: www.khan academy

Course Name : All Branches of Diploma in Engineering and Technology

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

Semester : Second

Subject Title : Development of Life Skills

Subject Code : 17010

Teaching and Examination Scheme:

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

Rationale:

Globalization has emphasized the need for overall development of technician to survive in modern era. Soft skills development in addition to technical knowledge; plays a key role in enhancing his/her employability.

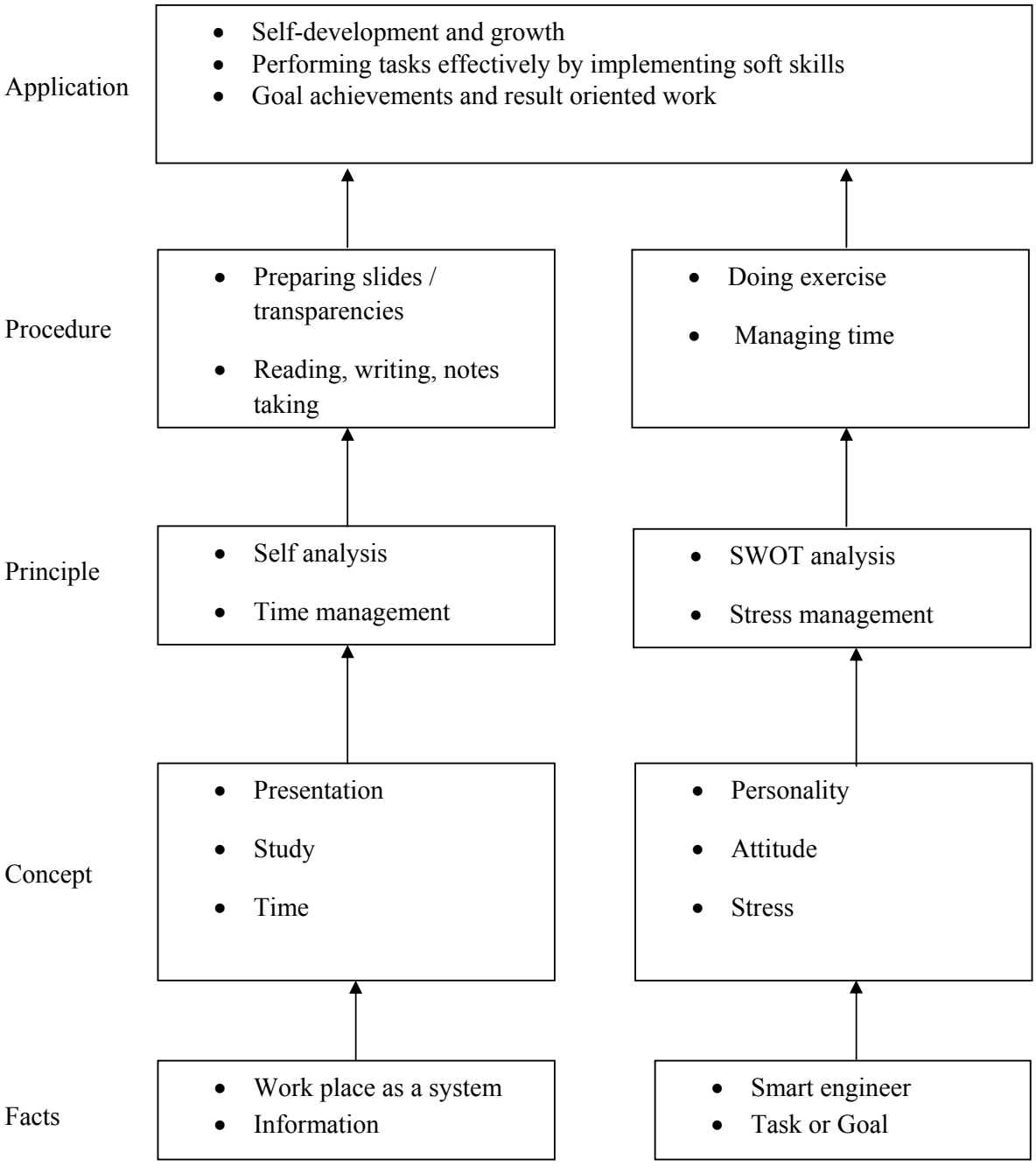
This subject aims to provide insights into various facets of developing ones personality in terms of capabilities, strengths, weakness, etc as well as to improve reading, listening and presentation skills. Also in this age fierce competition, the time and stress management techniques will immensely help the technician to live happy and purposeful life.

General Objectives:

After studying this subject, the students will be able to:

1. Understand and appreciate importance of life skills.
2. Use self-analysis and apply techniques to develop personality.
3. Use different search techniques for gathering information and working effectively.
4. Improve the presentation skills.

Learning Structure:



Theory:

Topic and Contents	Hours
TOPIC 1: SELF ANALYISIS Specific Objectives: ➢ To introduce oneself. Contents: 1.1 Need of Self Analysis 1.2 Attitude and types (positive, negative, optimistic and pessimistic) Guidelines for developing positive attitude.	02
TOPIC 2: STUDY TECHNIQUES Specific Objectives: ➢ To identify different process and strategies. ➢ To improve reading, listening and notes taking skills. Contents: 2.1 Learning strategies 2.2 Learning process 2.3 Organization of knowledge 2.4 Reading skills 2.5 Listening skills 2.6 Notes taking 2.7 Enhancing memory	03
TOPIC 3: INFORMATION SEARCH Specific Objectives: ➢ To search information as per the need. Contents: 3.1 Sources of information 3.2 Techniques of information search (library, internet, etc)	02
TOPIC 4: SELF DEVELOPMENT Specific Objectives: ➢ To set primary goals using SMART parameters. ➢ To Priorities the work effectively. ➢ To cope up with stress effectively. Contents: 4.1 Goal setting and its importance. 4.2 Characteristics of Goal setting (**SMART- S**pecific, **M**easurable, **A**ttainable, **R**ealistic, **T**ime bound) 4.3 Time Management - Importance, prioritization of work, time matrix, time savers, and time wasters. 4.4 Stress Management - Definition, types of stress, causes of stress, managing stress, and stress busters.	05
TOPIC 5: PRESENTATION TECHNIQUES Specific Objectives: ➢ To plan for presentation. ➢ To prepare contents for presentation. Contents:	02

5.1 Importance of presentation. 5.2 Components of effective presentation (Body language, voice culture , rehearsal, etc) 5.3 Preparing for presentation. 5.4 Use of audio/video aids. (audio, video, transparency's, PowerPoint presentations, etc) 5.5 Performing presentation (Seminars, paper presentations, compering, etc)	
TOPIC 6: GROUP DISCUSSION Specific Objectives ➢ To understand the concept of group discussion ➢ To know the purpose of group discussion Contents 6.1 Group discussion concept and purpose 6.2 Method of conduction	**02**
Total	**16**

Practical:
Skills to be developed:

Intellectual Skills:

Student will be able to

- Develop ability to find his capabilities.
- Select proper source of information.
- Follow the technique of time and stress management.
- Set the goal.

Motor Skills:

Student will be able to

- Follow the presentation of body language.
- Work on internet and search for information.
- Prepare slides / transparencies for presentation.

List of Practicals/activities:

1. Giving self introduction. Observe the demonstration of self introduction given by the teacher and prepare a write up on the following points and introduce yourself in front of your batch in 5 minutes
   - Name
   - Native place
   - Background of school from where he / she passed
   - Family background

- Hobbies / salient achievements / idols if any for self development
- Aims of life as an Engineer

2. Provide responses to the questions based on the moral story given in the assignment.
3. Judge your attitude by responding to the tests given in the assignment and write comments on your score.
4. Read any chapter from the subject of Engineering Physics / Engineering Chemistry and identify facts, concepts, principles, procedures, and application from that chapter
5. Participate in the panel discussion on techniques of effective learning and provide the responses to the questions.
6. Access the book on Biography of Scientists/Industrialist/Social leader/Sports Person from library. Read the book and note the name of author, publication, year of publication, and summarize the highlights of the book.
7. Prepare notes on given topic by referring to books / journals / websites.
8. Prepare 8 to 10 power point slides based on the notes prepared on the above topic. Present the contents for 10 minutes Group wise(Group will be of 4 students)

Note – Subject teacher shall guide the students in completing the assignments based on above practical.

Learning Resources:
Books:

Sr. No.	Author	Name of Book	Publication
1	Richard Hale and Peter Whitlam	Target setting and goal achievement	Kogan Page
2	Andrew Bradbury	Successful Presentation Skills	The Sunday Times – Kogan
3	Ros Jay and Antony Jay	Effective Presentation	Pearson – Prentice Hall
4	Subject Experts - MSBTE	Handbook on Development of Life Skills	MSBTE
5	Nitin Bhatnagar and Mamta Bhatnagar	Effective Communication and Soft Skills	Pearson
6	D. Sudha Rani	Business Communication and Soft Skills	Pearson
7	Barak K Mitra	Personality Development and Soft Skills	Oxford University Press
8	Dr. T. Kalayani Chakravarti and Dr. Latha Chakravarti	Soft Skills for Managers	Biztantra

Course Name : Civil Engineering Group

Course Code : CE/CS/CR/CV

Semester : Second

Subject Title : Workshop Practice (Civil)

Subject Code : 17012

Teaching and Examination Scheme:

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

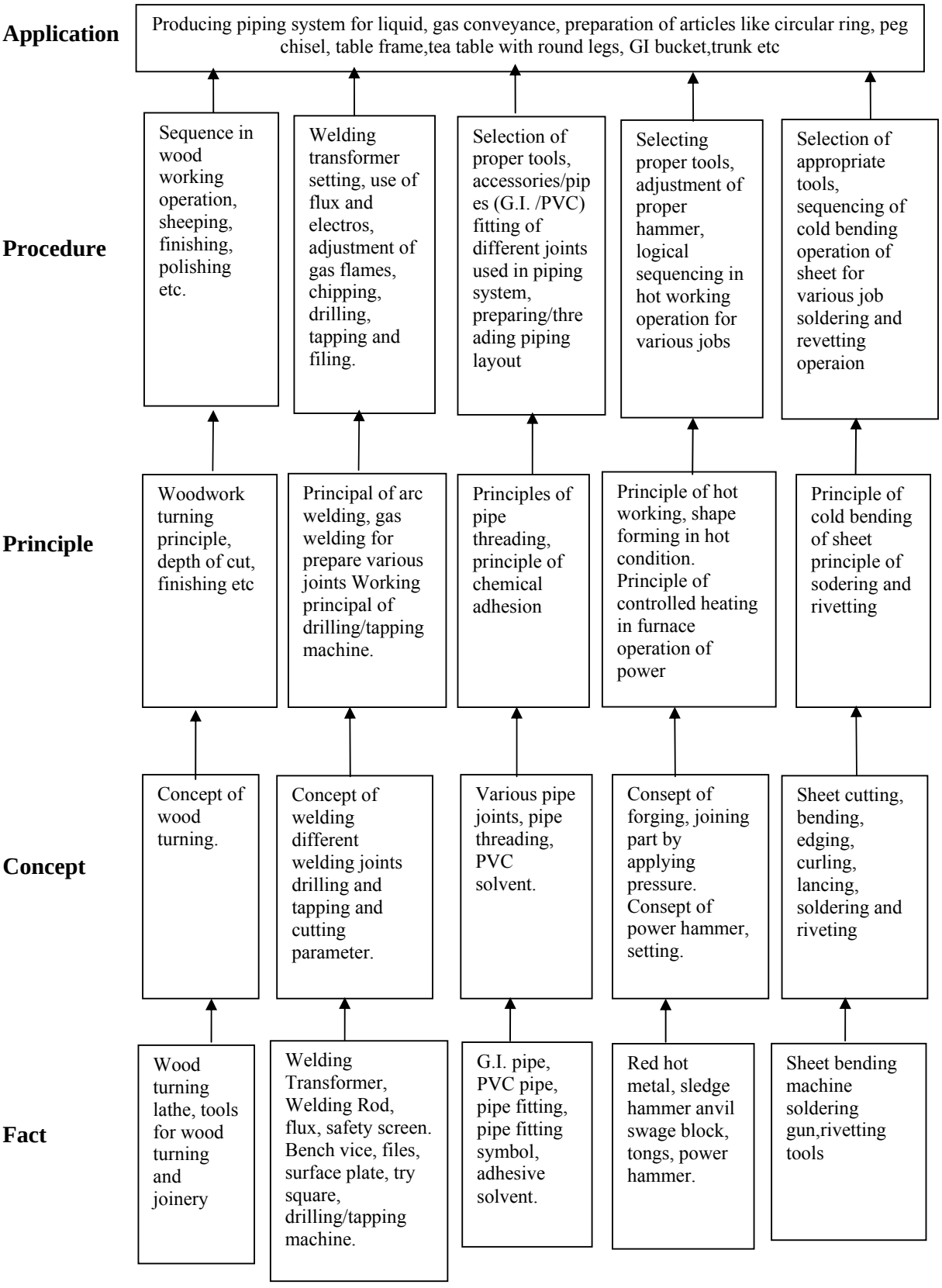
Rationale:

CIVIL diploma technician is expected to acquire basic workshop skills and should be able to exhibit them whenever needed during execution of various works. The students are required to identify, operate and control various machines in different shops of workshop. Selection of appropriate tools and different equipments will be useful for performing various jobs in wood working, welding, smithy shop, plumbing shop, etc. which are needed for different construction works.

Knowledge of wood working will be useful for executing the joinery work in the construction. Knowledge of welding will be useful while supervising the welding work involved in the civil engineering construction .Knowledge of plumbing will be useful necessary for supervising the laying of pipe lines for conveying liquid and gas .

Knowledge of smithy will be useful for the supervision of the items of work were smithy operation is involved. Knowledge of sheet metal work will be useful for the supervision of the sheet metal item of work Knowledge of wood working, welding, plumbing, smithy and sheet metal work will enable the diploma technician to execute the construction work properly as and when required.

Learning Structure:



Objectives: To be developed following skills

Intellectual Skills:

- Understanding job drawing.
- Identify proper material, tools, equipments and machines.
- To know parameter like cutting speed, feed, depth cut use of lubricants in machine.

Motor Skills:

- Set tools, wore piece and machine for desired operation.
- Operate tools and machine complete job as per job drawing in allotted time
- Use safety equipments and follow safety procedures during operation.
- Inspect the job for confirming desired dimension and shape.
- Acquire hands on experience.

CONTENTS:

Guide lines for conduct of work shop practicals

Assignment in the practical content shall be performed by the student under the guidance of workshop superintendent/subject teacher. Various tools, different processes (operation) shall be exhibited to the student before writing the assignment. The teacher shall guide the student for calculating the cost of articles prepared Subject teacher/ workshop superintendent shall check the assignment submitted by the students and provide feedback to the students.

Termwork shall consists of

1. File containing the assignments
2. Job drawing, working process etc written in workshop diary.

Term work assessment shall be done with following norms: Assignment -10 Marks, workshop dairy and job prepared - 40 Marks, Total - 50 marks

3. Safety precautions should be observed while working in the workshop.
4. A Batch for the practical shall have 6to8 students depending upon the valume of work.
5. Student shall be guided to calculate cost of materials and labour required for their job from the drawing

Shop and Content

Shop 1. WOOD WORKING SHOP
CONTENT:
Assignment ……..……..**01**
1. Draw sketch of wood turning lathe, label the components, precaution in wood turning, draw sketch of carpentary tools use for turning.
2. Visit to local carpetnary shop to show different carpentary operations and joinery work.

Demonstration..…… ……..... **01**
1. Observe the operations of wood working process like plaining, marking, chiseling, grooving and turning of wood.
2. Practice different wood working process and turning of wood.

Job …….....…….. **04+04**
Job of standard size (Salable / marketable, articles shall be prepared)
1. Prepare one composite job from the following involving different joints turning & planning, surface finishing by emery paper, varnishing etc. like square stools, tea table, chaurang, table lamp, bed, sofaset, book rack, cabinet, notice board, showcase and table chairs etc. Including calculation of the cost of material and labour cost required for the job from the drawing.
2 One job on turning like sofaset leg: chaurang leg etc

Shop 2. WELDING SHOP
CONTENT:
Assignment …….……..... **02**
1. Write a short the process for arc welding, gas welding, gas cutting, draw standard symbol for welding.

Demonstration..…….....…. **01+01**
1. Observe the process of arc welding, gas welding, gas cutting.
2. Practice for welding in different situation.

Job …….....……. **06**
Job of standard size (Salable / marketable, articles shall be prepared)
1. Prepare any one composite job from the following involving butt joint, lap joint, welding process, from the following like grill, door frame, window frame, waste paper, baket, chappal stand, corner flower stand, table frame (square pipe 25 mm, cooler frame (folding type). Including calculation of the cost of material and labour cost required for the job from the drawing.

Shop 3. SMITHY SHOP
CONTENT:
Assignment …….....…**01+ 01**
1. Draw sketches of different forging tools, and write its purpose. Draw lable sketch of power hammer.
2. Described different forging processes like, shaping, caulking, fullering & setting down operation.

Demonstration.....……**02**
1. Observe the operation of different process like, shaping, caulking, fullering etc.

Job …….....……. **06**
Job of standard size (Salable / marketable, articles shall be prepared)
1. Prepare any one like crane hook, plane hook, eye hook, door hook, flat chisel, square alun key, hook & peg. Including calculation of the cost of material and labour cost required for the job

from the drawing.

Shop 4. PLUMBING SHOP
CONTENT:
Assignment …….....……**02+ 02**
1. Draw sketches of different pipe fitting and accessories. State its purpose.
2. List different sizes of G.I. and flexible pipe used for fitting. List different adhesive solvent. Used for fitting.

Demonstration.....……**01+01+01**
1. Observe the operation threading to G.I. pipe with jointing & jointing of PVC pipe.
2. Observe the preparation of actual pipe line layout by using different accessories.
3. Practice for actual pipe line by using PVC pipe and accessories without using adhesive.

Job …….....……..... **07**

Job of standard size (Saleable / marketable, articles shall be prepared)
1. Prepare any one complete job for G.I. pipe with socket, plug, elbow, with operation of cutting, threading and fitting. Including calculation of the cost of material and labour cost required for the job from the drawing.

Shop 5. SHEET METAL SHOP
CONTENT:
Assignment……**01+ 01**
1. Draw sketches of different tools and machine use for sheet metal work & state it purpose.
2. Draw the sketch of soldering gun and revetting tools and describe the process of both.

Demonstration..……**01+01**
1. Observe the different the sheet metal operation like cutting, bending, edging, curling, lancing, soldering and revitting.
2. Practice for operation like sheet cutting, bending, edging, curling, lancing, soldering & revetting.

Job..... ..**06**

Job of standard size (Salable / marketable, articles shall be prepared)
1. Prepare any one complete job from following letter box, trunk, grain container, water heater container, bucket, waste paper bakset, cooler tray, water draining channel, involving different sheet metal operation. Including calculation of the cost of material and labour cost required for the job from the drawing.

Shop 6. DEMONSTRATION OF POWER TOOLS AND PRACTICE UTILITY ITEMS
CONTENT:
Assignment……..…**02**
1. Draw a line sketch of power tools, pneumatic tools, electric wiring tools and accessories, label the parts and state its use.

Demonstration ……..…**01+01**
1. Observe the operation of power tools, pneumatic tools, electric wiring tools.
2. Practice for use of electric wiring tools.

Job ……..... **06**

1. Prepare a electrical switch board with two socket, holder, bulbs and piono buttons and with electrical wiring for three meter length. OR any other electric item as per requirement of institute

Learning Resources:

1. Books:

Sr. No.	Name of Author	Name of Books	Publisher
01	S.K. Hajara Chaudhary	Workshop Technology	Media promoters and publisher, 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	S.G. Deolallkar	Plumbing (Design and Practice)	M C Grawhill, New Delhi
05	H.S. Bawa	Workshop Practice	M C Grawhill, New Delhi

2. CBT Packages Developed by NITTR Bhopal

3. Transparences

4. Website

a) www.copper.org
b) www.wikipedia.com/plumbing
c) www.howstuffworks.com

2. CDs:-

Videos and presentation about variouse tools, equipment are available on the webseti of tools and equipment manufacturer and also avilable on the slide share website.

a) www.copper.org
b) www.wikipedia.com/plumbing
c) www.howstuffwork.com

3. Visits:-

1) Visit to local carpentryshop to show different carpentry operation, jionery works.
2) Visit to fabrication to observe the process of ARC welding. Gas welding Etc.