MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

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

COURSE NAME : DIPLOMA IN TEXTILE MANUFACTURES, TEXTILE TECHNOLOGY AND FASHION & CLOTHING TECHNOLOGY

COURSE CODE : TX, TC, DC

DURATION OF COURSE: 6 SEMESTERS **WITH EFFECT FROM 2012-13**

SEMESTER : FIRST **DURATION : 16 WEEKS**

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

SR. NO	SUBJECT TITLE		Abbre viation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME										
					TH	TU	PR	PAPER HRS	TH (1)			PR (4)			OR (8)		TW (9)		SW (17100)
									Max		Min	Max		Min	Max	Min	Max	Min	
1	English		ENG	17101	03	--	02	03	100		40	--		--	--	--	25@	10	50
2✶	Basic Science	Physics	EPH	17102	02	--	02	02	50	100	40	25@	50	20	--	--	--	--	
		Chemistry	ECH	17103	02	--	02	02	50			25@			--	--	--	--	
3	Basic Mathematics		BMS	17105	04	01	--	03	100		40	--		--	--	--	--	--	
4	Engineering Graphics		EGG	17001	02	--	04	--	--		--	50#		20	--	--	50@	20	
5	Elements of Textile Technology		ETT	17008	03	--	02	02	50#*		20	--		--	--	--	25@	10	
6	Basic Workshop Practice		WPC	17009	--	--	02	--	--		--	--		--	--	--	50@	20	
				TOTAL	**16**	**01**	**14**	**--**	**350**		**--**	**100**		**--**	**--**	**--**	**150**	**--**	**50**

Student Contact Hours Per Week: **31 Hrs.**

Theory and practical periods of 60 minutes each.

Total Marks **: 650**

@ Internal Assessment, # External Assessment, #* On Line Examination, [ ] No Theory Examination.

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 as mentioned.

✶ Basic Science is divided into two parts- Basic Physics and Basic 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 Basic 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 Basic 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 and Technology.

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

Semester : First

Subject Title : English

Subject Code : 17101

Teaching and Examination Scheme:

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

 # External **@ Internal** **#* On line examination**

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:

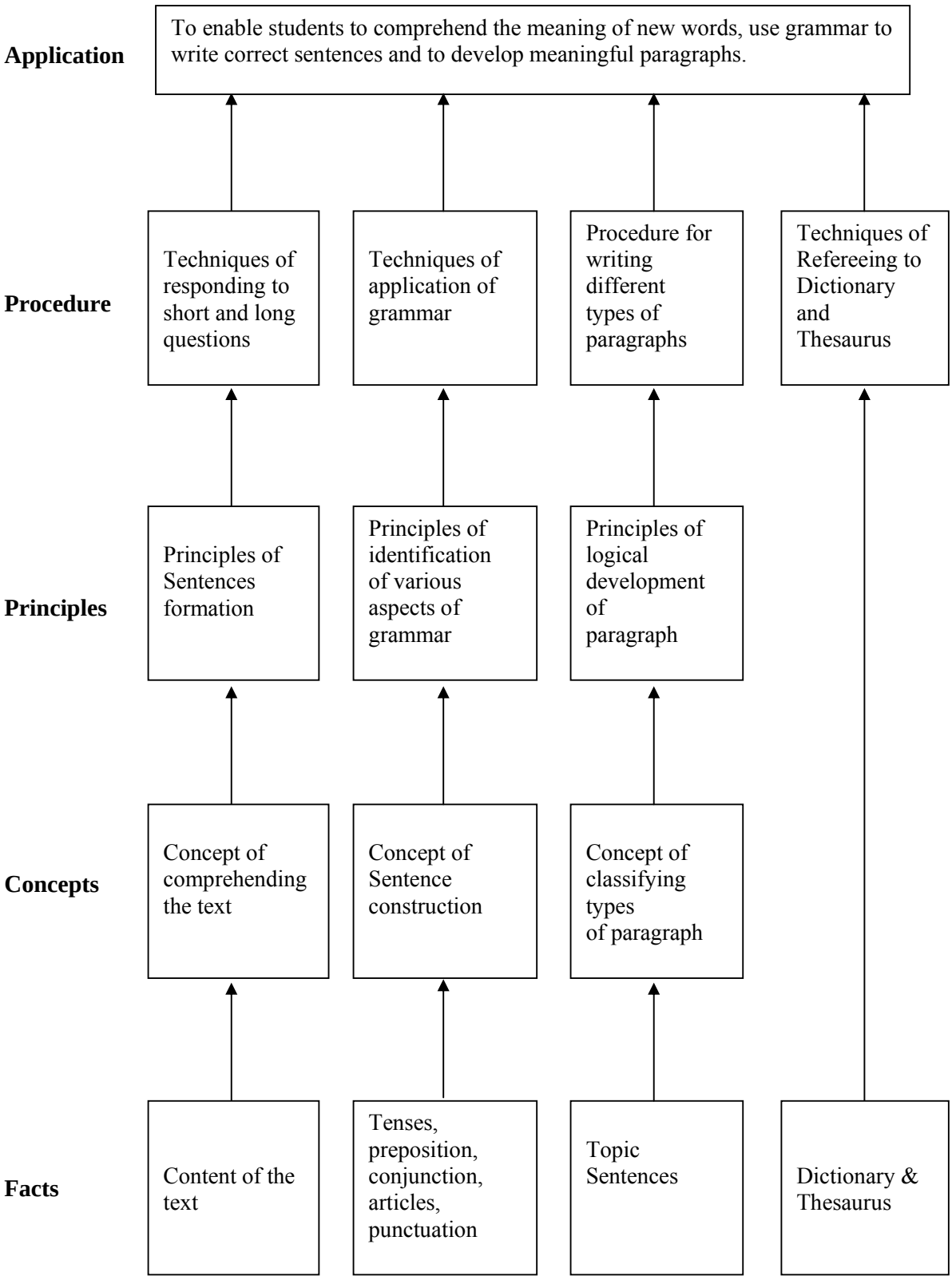
The most commonly used medium to express oneself is language. English, being a global language, is used in all the spheres of human life i.e., personal, professional and social. A diploma student is expected to be proficient in English language and pursue the existing course of study to handle the future jobs. The content of the text includes the aspects related to language skills.

General Objectives:

Students will be able to;

1. Develop vocabulary.
2. Apply the rules of grammar.
3. Comprehend the given unseen passage.

Learning Structure:



CONTENTS: Theory

Name of the Topic	Hours	Marks
PART I - Application of Grammar **Specific Objective**: ➢ Apply grammatical rules to form correct sentences. **Contents:** ▪ **Articles**: Appropriate use of definite and indefinite Articles ▪ **Prepositions**: To use correct Prepositions as per context ▪ **Conjunctions**: Co-ordinating and sub-ordinating Conjunctions ▪ **Tenses**: Correct usages of past, present and future tenses ▪ **Active and Passive voice**: Use of Active and Passive voice ▪ **Direct and Indirect sentences**: Conversion of direct into indirect sentence and vice versa	**12**	**24**
PART II – Text **Specific Objectives:** ➢ Answer the questions based on the articles ➢ State the meanings of the given words from the articles **Contents:** ▪ Articles	**20**	**32**
PART III - Paragraph Writing **Specific Objective:** ➢ Write a paragraph on a given topic **Contents**: ▪ **Paragraph Writing**: Elaborate and expand the ideas with cohesion, coherence and use of correct punctuation marks ▪ **Types of Paragraph**: Narrative, Descriptive, Technical, Comparison and Contrast ▪ **Dialogue Writing**: Based on various situations ▪ **Speech Writing based on situations:** Welcome Speech, Farewell Speech, Vote of Thanks and Introducing a Guest	**06**	**16**
PART IV – Comprehension **Specific Objective:** ➢ Comprehend and provide the answers on given passages **Contents:** ▪ **Comprehension of Passage**: Comprehending questions and writing the answers on unseen passages	**04**	**12**
PART V- Vocabulary Building **Specific Objective:** ➢ Use correct words in given situations **Contents**: ▪ Words Often Confused	**06**	**16**

▪ Collocation ▪ Prefix and Suffix ▪ Synonyms and Antonyms		
Total	**48**	**100**

Skills to be developed in practicals:

Intellectual Skills:

1. Select appropriate words/verbs and formulate correct sentences
2. Develop ability of correct pronunciation
3. Report writing skills

Assignments:

Journal consists of the following assignments:-

1. Punctuate 25 sentences given by the teacher.
2. Rewrite the passage/passages with correct form of verbs. [Teacher is expected to give passage /passages of verbs used wrongly [at least 25 verbs.]
3. Write 15 synonyms and 15 antonyms with the help of the thesaurus.
4. Write a paragraph each on descriptive, narrative, comparison, contrast and technical type in 75 to 100 words.
5. Write 10 words of prefixes and 10 words of suffixes and use them in sentences.
6. Select one news from any English newspaper. The news may be from any one of the following areas - Social, environmental, financial, economics, sports, etc. Prepare a summary of the news and make it presentable by using relevant photographs/graphics.
7. Students will be given ten collocations, develop three sentences for each collocation.

NOTE*:* The following assignment should be performed in the Language Laboratory/with the help of interactive media.

8. Listen and practice the dialogues with the help of interactive media/ interactive software.

Learning Resources:

Sr. No.	Title	Author	Publisher
1	MSBTE TEXTBOOK	----------	MSBTE
2	ESSENTIAL ENGLISH GRAMMAR	RAYMOND MURPHY	CAMBRIDGE
3	HIGH SCHOOL ENGLISH GRAMMAR AND COMPOSITION	WREN AND MARTIN	S CHAND & CO.

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/X/IC/IE/IS/ ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX

Semester : First

Subject Title : Basic Science (Physics)

Subject Code : 17102

Teaching and Examination Scheme:

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

 # External **@ Internal** **#* On line examination**

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)
- Students should compulsory appear for Basic Science (Physics) & Basic Science (Chemistry) theory examination. There should be combined passing for the subject (40/100). Remaining absent in any examination of any part will not be declared successful for that examination head.
- Students should compulsory appear for Basic Science (Physics) & Basic Science (Chemistry) practical examination. There should be combined passing for the subject (20/50). Remaining absent in any examination of any part will not be declared successful for that examination head.

Rationale:

Physics is a foundation of all core technology subjects. Study of science and technology goes hand in hand. Technical knowledge can be gained more effectively using concepts of Physics. Curriculum of Engineering Physics includes fundamental concepts used in industrial applications.

Study of various properties of matter is helpful in the study of Strength of Material, Fluid mechanics, Fluid power etc., and selection of lubricant for machine parts. Property of Surface tension is applicable in Paint industry and capillarity phenomenon is useful in plumbing.

Thermal properties of matter are applicable in study of various core technology subjects like Thermal Engineering, Heat Transfer etc. Optical phenomena such as refraction and dispersion are required in higher study as well as in industry such as in characterization of material using Spectroscopy, X-ray diffraction (XRD), Atomic Force Microscopy (AFM).

Study of wave motion, Simple Harmonic Motion and their behavior is useful in field of Civil Engineering, Electronics & Communication Engineering, Mechanical Engineering and Electrical Engineering.

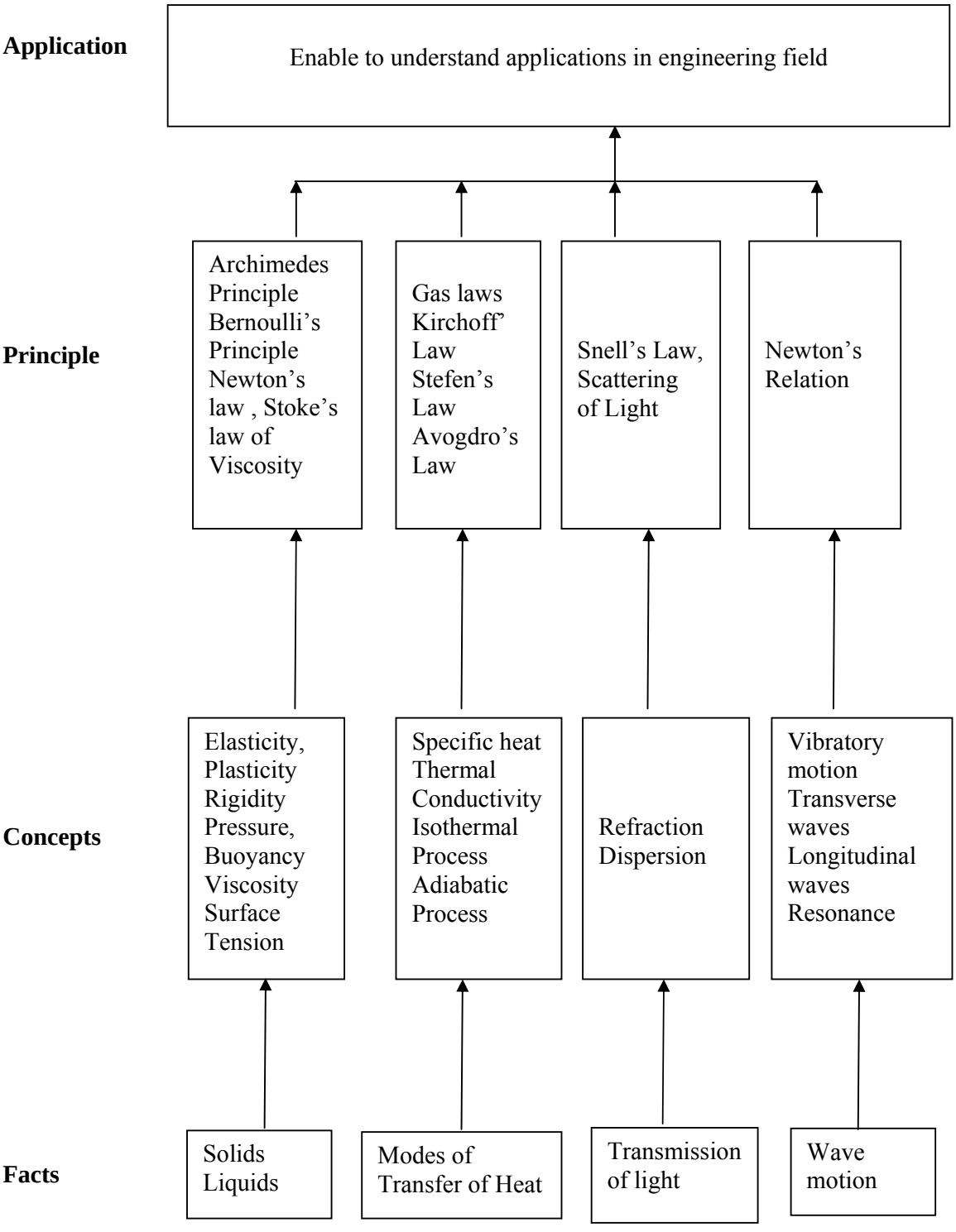
Principle of Photocell and its applications are required in study of Solar cells, Photovoltaic cells.

General Objectives: Student will be able to:

1. Understand method of selection of material for intended purpose.

2. Apply knowledge of good and bad conductors of heat in various engineering concepts.
3. Know the effect of interference between light waves.
4. Apply knowledge of characteristics of wave motion and resonance in engineering applications.
5. Apply Concept of photoelectric effect for applications like photovoltaic cell, Solar cell.

Learning Structure:



Theory:

Topic and Contents	Hours	Marks
Topic 1] Properties of solids: **Specific Objectives** ➢ Calculate the Young's Modulus of material of wire. • **Elasticity:** Definitions of deforming force, restoring force, elasticity, plasticity, Factors affecting elasticity. • **Stresses**: Tensile, Compressive, Volumetric and Shear stress, • **Strains:** Tensile, Volumetric and Shear strain. • Elastic limit, Hooke's law. • **Elastic co-efficient-** Young's modulus, bulk modulus, modulus of rigidity and relation between them • Stress -strain diagram, behavior of wire under continuously increasing load, yield point, ultimate stress, breaking stress, factor of safety. compressibility, Poisson's ratio.	**05**	**08**
Topic 2] Properties of liquids **Specific objectives:** ➢ Determine the surface tension of the given liquid ➢ Determine the coefficient of viscosity by Stoke's method. **2.1 Fluid friction: [8 Marks]** • Pressure, pressure-depth relation ($P = \rho h g$), atmospheric pressure, Pascal's law, Archimedes's principle. • Viscous force, definition of viscosity, velocity gradient, Newton's law of viscosity, coefficient of viscosity and its SI unit. • Streamline and turbulent flow with examples, critical velocity, Reynold's number and its significance. • Up thrust force, terminal velocity, Stokes law, and derivation of coefficient of viscosity by Stoke's method, effect of temperature and adulteration on viscosity of liquid. **2.2 Surface tension : [4 Marks]** • Cohesive and adhesive force, Laplace's molecular theory of surface tension, Surface Tension: definition and unit, effect of temperature on surface tension. • Angle of contact, Capillarity and examples of capillary action, derivation of expression for surface tension by capillary rise method, applications of surface tension.	**09**	**12**
Topic 3] Thermal properties of matter: **Specific objectives:** ➢ Distinguish between isothermal and adiabatic process. ➢ Determine the relation between specific heats. **3.1 Modes of transformation of heat : [6 Marks]** • Difference between heat and temperature, definition of calorie, Absolute zero, units of temperature: °C, °F,°K, with their conversion. • Conduction, law of thermal conductivity, coefficient of thermal conductivity, good conductors of heat & insulators with suitable examples, applications of conduction. Convection, applications of convection. Radiation, applications of radiation. **3.2 Gas laws: : [6 Marks]** • Gas Laws: Boyle's law, Charles law, Gay lussac's law (Statement and mathematical equation only)	**08**	**12**

• Perfect gas equation (PV=RT) (No derivation), specific heat of a substance , SI unit, specific heat of gas at constant volume (C_V) specific heat of gas at constant pressure (C_P), ratio of specific heat ,Mayer's relation between C_P and C_V ,isothermal process, adiabatic process, difference between isothermal process and adiabatic process.		
Topic 4] Optics **Specific objectives:** ➢ Calculate refractive index of prism. ➢ Determine the numerical aperture of optical fiber **Refraction of light : [6 Marks]** • Refraction of monochromatic light, Snell's law, Derivation of prism formula, total internal reflection, critical angle. • Optical fibre: principle, structure of optical fiber, propagation of light wave through optical fibre, derivation of numerical aperture and acceptance angle.	**04**	**06**
Topic 5] Wave motion **Specific objectives:** ➢ Differentiate between transverse waves and longitudinal waves ➢ Derive expression for displacement, velocity and acceleration of a body executing SHM **5.1 Wave motion : [6 Marks]** • Definition of a wave, wave motion, wave velocity, wave period, wave frequency, wave length, vibratory motion, periodic motion, amplitude of a vibrating particle, derivation of $v = n \lambda$ • Simple harmonic motion (SHM), examples of SHM, equation of SHM, expression of velocity and acceleration of a body executing SHM. • Types of progressive waves**:** transverse and longitudinal waves with examples. **5.2 Resonance: [6 Marks]** • Stationary wave, formation of stationary wave, examples of stationary wave, characteristics of stationary waves, free and forced vibrations with examples. • Resonance: definition of resonance, examples of resonance, formula to calculate velocity of sound by resonance tube method.	**06**	**12**
Total	**32**	**50**

Practical:

Skills to be developed

1) **Intellectual skills-**
   - Select proper measuring instruments
   - Verify the principles, laws, using given instruments under different conditions.
   - Read and interpret the graph.
   - Interpret the results from observations and calculations.
2) **Motor skills-**
   - Handle the instruments.
   - Measuring physical quantities accurately.
   - Observe the phenomenon and to list the observations in a tabular form.
   - Plot the graphs.

List of experiments

1. Know your Physics Laboratory, measuring instruments and interpretation of graph.
2. Measure the dimensions of given objects using vernier caliper.
3. Measure the dimensions of given objects using micrometer screw gauge.
4. Determine Young's modulus of elasticity of metal wire by using Searle's apparatus.
5. Determine coefficient of viscosity of given liquid using Stoke's Method
6. Determine surface tension of liquid by capillary rise method using travelling microscope.
7. Determine the coefficient of thermal conductivity of copper by Searle's method
8. Determine refractive index of liquid by concave mirror.
9. Determine stiffness constant 'K' of a helical spring.

Learning Resources:

1. Reference Books:

Sr. No.	Title	Author	Publisher
01	Engineering Physics	B.L. Theraja	S. Chand Publishers – New Delhi
02	Engineering Physics	V. Rajendran	Tata McGraw-Hill Publications
03	Conceptual Physics	P. G. Hewitt	Pearson education (Tenth edition)
04	Physics- Std XI, Std XII	-	HSC board/CBSE Board
05	Engineering Physics	R.K.Gaur and S.L.Gupta	Dhanpat Rai Publication, New Delhi.

2. Websites:

http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html
http://physics.info
http://inventors.about.com/od/xyzstartinventions/a/x-ray.htm
http://www.kettering.edu/physics/drussell/Demos/waves/wavemotion.html
http://physics.usask.ca/~hirose/ep225/anim.htm
http://hyperphysics.phy-astr.gsu.edu/hbase/geoopt/dispersion.html

3) Videos:

1. http://www.youtube.com/watch?v=u5AxlJSiEEs: Demonstration showing **surface tension** of water using screen
2. http://www.youtube.com/watch?v=v5h3h2E4z2Q Demonstration showing Photoelectric effect and Photo Cell
3. http://www.youtube.com/watch?v=42Qv8lkB-nM Demonstration showing viscosity of various liquids
4. http://www.can-do.com/uci/ssi2003/gas-laws.html Demonstration of various Gas Laws

4) CD:

Educational Cd of NCERT
Educational cd of Pearson education India

5) PPT:

www.slidehare.net/donpraju/photoelectriceffect-ppt
www.khanacademy.com

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/X/IC/IE/IS/ ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX

Semester : First

Subject Title : Basic Science (Chemistry)

Subject Code : 17103

Teaching and Examination Scheme:

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

 # External **@ Internal** **#* On line examination**

Note:

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Rationale:

Basic Chemistry is the basic science which is essential to all engineering courses. For an engineer, the usage of equipments and instruments would require knowledge of chemical substances, their composition and properties. Hence the content of this subject provides knowledge of engineering materials. This knowledge also aims to bridge the theoretical concepts and their practical engineering applications, thus highlighting the role of chemistry in the field of engineering. It helps in understanding chemical and physical properties of engineering materials.

The content of this curriculum has four units which provide the knowledge of chemical bonding, mechanisms of various applications of electrochemistry. It also provides in depth knowledge of extraction processes, properties and applications of metals and alloys. The non-metallic materials like plastics, rubber, insulators are the back bone of developing industries.

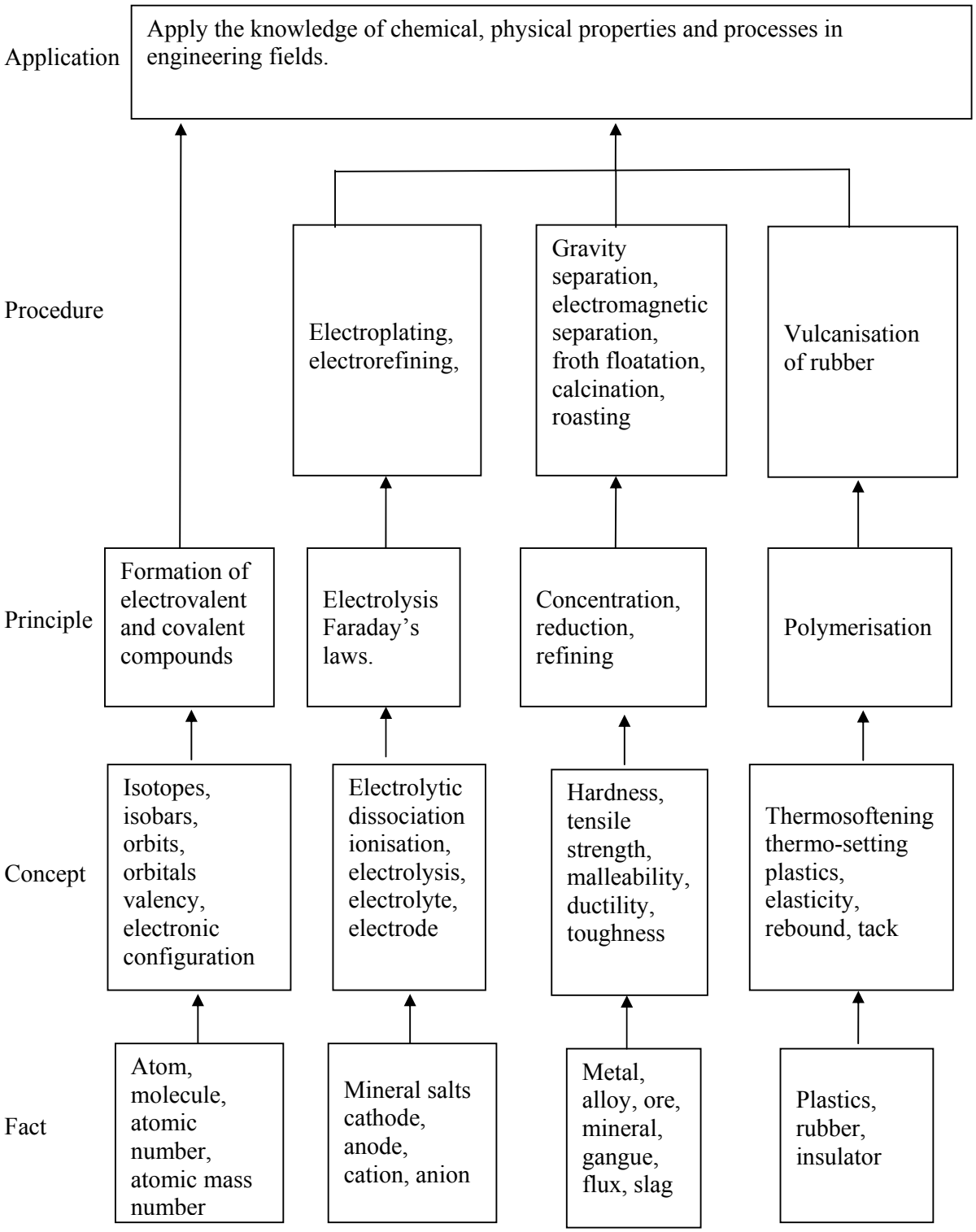
General Objectives:

The student will be able to

1. Know the concepts of valence electrons and valency of elements.

2. Apply the knowledge of electrolysis in engineering applications.
3. Understand the formation of various molecules.
4. Apply the properties of metals and alloys in engineering field.
5. Use non-metallic materials in engineering applications.

Learning Structure:



Theory Content:

Topic and Contents	Hours	Marks
Topic 1] Chemical Bonding: **Specific Objectives:** ➢ Predict valence electrons and valency of elements. ➢ Draw schematic diagram for formation of molecules. **1.1 Atomic Structure : [8 Marks]** • Definition of atom, Bohr's atomic model, structure of modern atom, characteristics of fundamental particles of an atom, definition of atomic number, atomic mass number and their differences, Isotopes and Isobars: Definitions, examples and distinction, applications of carbon and cobalt isotopes. Orbits: Bohr's energy levels, sub-energy levels, s, p, d, f orbitals, shapes and description of s-orbital and p- orbital. Distribution of electrons in orbitals: Definition of electronic configuration, Aufbau's principle, Hund's rule, orbital electronic configurations (s, p, d, f) of elements having atomic number 1 to 30, **1.2 Valency: [4 Marks]** • Definitions of valence electrons, valency. • Definition of electrovalency, positive and negative electrovalency, formation of Electrovalent compounds-MgO,$CaCl_2$ • Definition of covalency, single, double and triple covalent bonds, formation of Covalent compounds H_2O,CO_2,N_2	**08**	**12**
Topic 2] Electrochemistry: **Specific Objectives:** ➢ Describe the mechanism of electrolysis. ➢ Identify the role of electrodes in application of electrolysis. **2.1 Basic concepts of electrolysis: [4 Marks]** • Electrolyte, types of electrolyte- strong and weak electrolyte, their difference. • Ionisation and electrolytic dissociation, Arrhenius theory of electrolytic dissociation, degree of ionization, factors affecting degree of ionization. Definitions of electrolytic cell, electrodes-cathode, anode, electrode potential-oxidation potential and reduction potential. **2.2 Electrolysis: [10 Marks]** • Mechanism of electrolysis- Electrolysis, electrochemical series for cations and anions, • Mechanism of electrolysis of $CuSO_4$ solution by using platinum electrodes and copper electrodes • Applications of electrolysis- Electroplating of silver, electro refining of blister copper, • Faraday's laws of electrolysis: Faraday's first and second law, relation between electrochemical equivalent and chemical equivalent, Numericals. • **pH and pOH:** Definition of pH, pOH, pH Scale, Numericals.	**10**	**14**
Topic 3] Metals and Alloys: **Specific Objectives:** ➢ Identify the properties of metals and alloys related to engineering applications. ➢ Describe the process of extraction of metals. **3.1 Metals: [8 Marks]**	**08**	**12**

• Occurrence of metals in free and combined state, definitions- mineral, ore, gangue, flux and slag, metallurgy. • Metallurgy- Detailed Flow chart for extraction of metal, • Important extraction processes-Concentration-gravity separation, electro-magnetic separation, froth floatation, calcination and roasting, Reduction-smelting, aluminothermic process, Refining- poling, electrorefining • Mechanical properties of metals- Hardness, ductility, malleability, tensile strength, toughness, machinability, weldability, forging, soldering, brazing, castability. **3.2 Alloys: [4 Marks]** • Definition, purposes of making alloys with examples. • Preparation methods- Fusion, Compression • Classification of Alloys- Ferrous and non ferrous alloys with examples. • Examples of alloys- Composition, properties and applications of duralumin, Woods metal, babbit metal.		
Topic 4] Non-metallic Engineering Materials: **Specific Objectives:** ➢ Distinguish between thermosoftening and thermosetting plastics. ➢ List the properties of rubber ➢ State the applications of thermal insulators. **4.1 Polymers (Plastics, Rubber) : [8 Marks]** • Plastics: Definition of plastic, polymer, polymerisation, types of polymerisation with examples. Types of plastic- thermo softening plastics and thermosetting plastics and their difference, properties and applications of plastics. • Rubber: Types of rubber. • Natural Rubber- definition, drawbacks of natural rubber, vulcanization of rubber with chemical reaction, applications of vulcanized rubber. Synthetic rubber- definition, difference between natural and synthetic rubber, examples of synthetic rubber, properties of synthetic rubber like - elasticity, tack, and abrasion resistance, their definition and related applications. **4.2 Thermal Insulators [4 Marks]** • Thermal Insulators -Definition, characteristics of thermal insulators, classification- organic and inorganic thermal insulators, their examples, preparation, properties and applications of thermocole and glasswool.	**06**	**12**
Total	**32**	**50**

Practical:

Intellectual Skills:

1. Analyse given solution and to find the chemical properties of metallic and non-metallic ions.
2. Interpret the results of experiments or numerical values.
3. Understand the set up of the experiment.
4. Verify the laws and characteristics.

Motor Skills:

1. Handle various laboratory reagents.
2. Accurately measure proper quantity of various chemicals.
3. Observe correct colour of precipitate, evolution of gas.
4. Connect electrical circuit as per the circuit diagram.

5. Proficiently handle apparatus and equipments to perform experiments.
6. Observe the completion of reaction.

List of Experiments:

Sr. No.	Name of the experiment
1	Know your Chemistry laboratory and prepare sample solutions of different concentrations.
2	Determine the basic radical (metallic ion) and acidic radical (non-metallic ion) by qualitative analysis of given salt solution no-1.
3	Determine the basic radical (metallic ion) and acidic radical (non-metallic ion) by qualitative analysis of given salt solution no-2.
4	Determine the basic radical (metallic ion) and acidic radical (non-metallic ion) by qualitative analysis of given salt solution no-3.
5	Determine the basic radical (metallic ion) and acidic radical (non-metallic ion) by qualitative analysis of given salt solution no-4.
6	Determine the basic radical (metallic ion) and acidic radical (non-metallic ion) by qualitative analysis of given salt solution no-5.
7	Calculate the electrochemical equivalent of copper by electrolysis of copper sulphate solution using copper electrodes.
8	Determine pH value of given solutions by using pH paper, universal indicator and pH meter.
9	Prepare Phenol formaldehyde resin used in manufacturing of Bakelite plastic.

Learning Resources:

1. Reference books:

Sr. No.	Author	Name of the book	Publisher
1	Jain and Jain	Engineering Chemistry	Dhanpat Rai and Sons
2	----	Engineering Chemistry	Wiley India Edition
3	B. K. Sharma	Industrial Chemistry	Goel Publication
4	S. S. Dara	Engineering Chemistry	S. Chand Publication

2. List of web sites/ Videos and animations:

Chemical Bonding
http://cas.sdss.org/dr6/en/proj/advanced/spectraltypes/energylevels.asp
http://en.wikipedia.org/wiki/Matter
http://en.wikipedia.org/wiki/Electron_configuration
http://www.chemguide.co.uk/atoms/propsmenu.html#top
http://www.chem1.com/acad/webtext/chembond/
http://www.footprints-science.co.uk/Chemistry.htm
http://www.youtube.com/watch?v=8tqfDE6vqcs&feature=related (Ionic Bonding)
http://www.youtube.com/watch?v=KjoQHqgzda8&feature=related (Chemical Bonding)
http://dwb4.unl.edu/chemAnime/ECONFIG/ECONFIG.html (electronic Configuration)
http://employees.oneonta.edu/viningwj/sims/atomic_electron_configurations_s1.html (electronic Configuration)

http://employees.oneonta.edu/viningwj/sims/atomic_electron_configurations_s2.html (electronic Configuration of Ions)
http://www.kentchemistry.com/links/AtomicStructure/PauliHundsRule.htm (Hunds Rule)
http://www.quimica3d.com/animations/en-21a.php (Orbital)
http://www.ausetute.com.au/lewisstr.html (Lewis Structure)
http://winter.group.shef.ac.uk/orbitron/AOs/2p/index.html (Atomic Orbitals)
http://ippex.pppl.gov/interactive/matter/molecule.html
http://www.kentchemistry.com/links/bonding/typesofBonds.htm (Chemical Bond)

Electrochemistry
http://en.wikipedia.org/wiki/Electrolysis
http://www.chem1.com/acad/webtext/elchem/
http://www.splung.com/content/sid/3/page/batteries
www.teachnet-uk.org.uk/...**Metals**/...**metals**/**Properties**%20of%20**Meta...**
http://www.authorstream.com/Presentation/aSGuest33360-286609-froth-flotation-Entertainment-ppt-powerpoint/
http://dwb4.unl.edu/chemAnime/index.htm
http://physchem.co.za/OB12-che/electrolysis.htm#copper (Electrochemistry)
http://www.mindzeit.com/chemistry.php

Metals and Alloys
http://en.wikipedia.org/wiki/Metal

Plastic and Rubber
http://www.tvo.org/iqm/plastic/animations.html# (Addition Polymerization)
http://www.tvo.org/iqm/plastic/animations.html# (Condensation Polymerization)
http://www.chemistryland.com/PolymerPlanet/Polymers/PolymerTutorial.htm (Plastic)
http://www.elmhurst.edu/~chm/vchembook/403rubber.html (Rubber)

Course Name: Diploma in Textile Manufactures, Textile Technology and Fashion & Clothing Technology

Course Code : TX / TC / DC

Semester : First

Subject Title : Basic Mathematics (for Textiles)

Subject Code : 17105

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	01	--	03	100	--	--	--	100

 # External **@ Internal** *** On Line Examination**

Notes:

- **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:

Mathematics is the foundation of science and technology. The study of Basic Mathematics is helpful to understand concepts of Engineering. This subject enhances logical thinking capability. It also improves the systematic approach in solving engineering problem.

Algebra provides the language and abstract symbols of mathematics. It also helps to use that Language in real-life applications.

Matrix and Determinant topics are helpful for finding optimum solution of system of simultaneous equations which are formed in the various branches of engineering using different parameters.

Trigonometry is the study of triangles and angles.

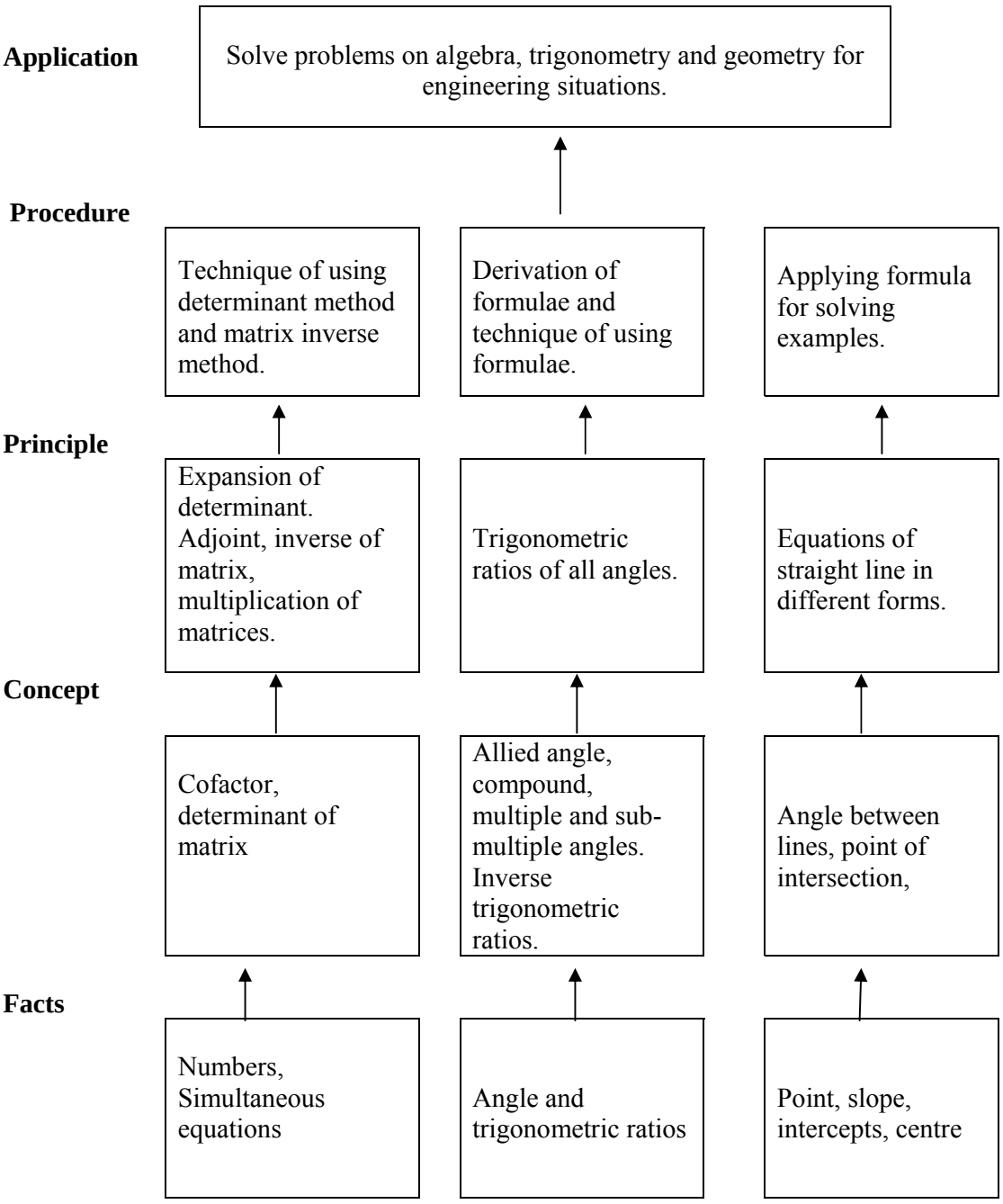
Geometry gives emphasis on understanding the deductive reasoning process. It includes writing derivations of theorems and giving geometric relationships by reasoning. Co- ordinate geometry plays an important role in Animation, AutoCAD, Computer graphics etc. Contents of this subject will form foundation for further study in mathematics.

General Objectives:

Student will be able to:

1. Apply Cramer's rule and matrix method to solve simultaneous equations in three variables.
2. Use concept of allied angle, compound angle, multiple and sub-multiple angles to solve engineering problems.
3. Use factorization and de-factorization formulae to solve examples.
4. Understand the relationship of two variables.

Learning Structure:



Theory

Topic and Content	Hours	Marks
Topic - I Algebra		
1.1 -Determinant ---------- 08 **Specific objectives:** ➢ Solve simultaneous equations in three variables using Cramer's rule. • Definition and expansion of determinant of order 3. • Cramer's rule to solve simultaneous equations in three variables.	04	40
1.2 - Matrices ---------- 20 **Specific objectives :** ➢ Perform all algebraic operations on matrices. ➢ Solve simultaneous equations in three variables. • Definition of a matrix of order m x n and types of matrices. • Algebra of matrices with properties and examples. • Transpose of a matrix with properties. • Cofactor of an element of a matrix. • Adjoint of matrix and inverse of matrix by adjoint method. • Solution of simultaneous equations containing two and three unknowns by matrix inversion method.	13	
1.3 -Partial fraction ---------- 12 **Specific objectives:** ➢ Find partial fraction of proper and improper fraction. • Definition of fraction, proper, improper fraction and partial fraction. • Resolve proper fractions into partial fraction with denominator containing i) non repeated linear factors, ii) repeated linear factors, iii) non repeated quadratic irreducible factors. • To resolve improper fraction in to partial fraction.	08	
Topic 2- Trigonometry		
2.1 -Trigonometric ratios of allied , compound , multiple and sub-multiple angles ---------- 16 **Specific objectives:** ➢ Solve examples of allied angle, compound angle, multiple and sub-multiple angles. • Trigonometric ratios of any angle. • Definition of allied angle, compound, multiple and sub-multiple angles. • Trigonometric ratios of above angles with proofs. Simple examples	12	40

2.2 Factorization and de-factorization formulae ---------- 12 **Specific objectives:** ➢ Derive factorization and de-factorization formulae to solve examples. • Formulae for factorization and de-factorization with proof and examples.	08	
2.3 Inverse trigonometric ratios ---------- 12 **Specific objectives:** ➢ Solve examples of inverse trigonometric ratios. • Definition of inverse trigonometric ratios. • Principal value of inverse trigonometric ratios. • Relation between inverse trigonometric ratios with proof and examples.	09	
Topic 3- Co-Ordinate Geometry		
3.1 Straight line ----------20 **Specific objectives:** ➢ Solve problems with given condition. • Angle between two lines with proof. Examples. • Condition of parallel and perpendicular lines. • Point of intersection of two lines, equation of line passing through point of intersection with given condition. • Perpendicular distance between point and line with proof and examples. • Distance between two parallel line with proof and examples.	10	20
Total	**64**	**100**

Tutorials:

Note: 1) Tutorials are to be used to get enough practice.

1) Make group of 20 students and for each group minimum 10 problems are to be given.

List of Tutorial:

Sr. No.	Topic for tutorial
1	Determinant.
2	Matrices (Algebra of matrices)
3	Matrices (Adjoint , inverse and solution of equations using matrix inversion method)
4	Partial fraction.
5	Trigonometric ratio of allied, compound angles.
6	Trigonometric ratio of multiple and sub-multiple angles.
7	Trigonometric ratio of multiple and sub-multiple angles.
8	Factorization and de- factorization formulae.
9	Inverse trigonometric ratios.
10	Straight line.

Learning Resources:

1. Books :

Sr. No	Title	Authors	Publication
1	Mathematics for Polytechnic	S.P. Deshpande	Pune Vidyarthi Griha
2	Trigonometry	S. L. Loney	S. Chand Publication
3	Matrices	Ayres	Schuam series McGraw Hill
4	Higher Engineering Mathematics	B. S. Grewal	Khanna Publication
5	Engineering Mathematics	S. S. Sastry	Prentice Hall of India

2. Websites:

i) 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/X/IC/IE/IS/ ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX

Semester : First

Subject Title : Engineering Graphics

Subject Code : 17001

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
02	--	04	--	--	50#	--	50@	100

 # External **@ Internal** **#* On Line Examination**

Notes: - 1) Students should use the A3 size sketchbook for class works.

2) Use approximately 570mm×380mm size drawing sheet for term work.

Rationale:

Engineering Graphics is the language of engineers. The concepts of Engineering Graphics are used to develop, express the ideas, and convey the instructions which are used to carry out jobs in the field Engineering. The course illustrates the techniques of graphics in actual practice. This preliminary course aims at building a foundation for the further course in drawing and other allied subjects. This subject is useful in developing drafting and sketching skills of students.

Objectives:

The student after studying this subject will be able to:-

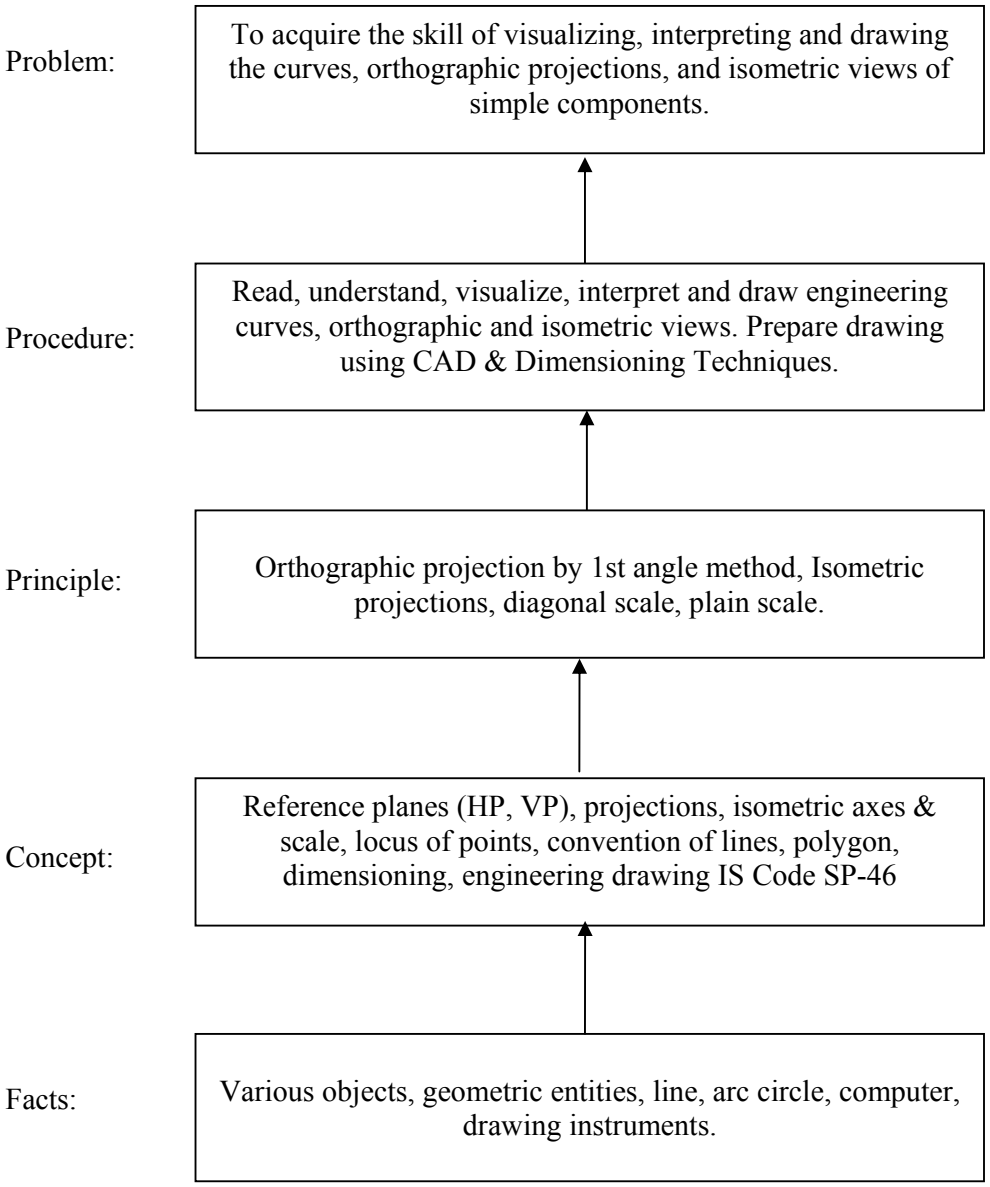
1) Draw different engineering curves and know their applications.

2) Draw orthographic projections of different objects.

3) Visualize three dimensional objects and draw Isometric Projections.

4) Draw simple geometrical figures using CAD package.

Learning Structure:



Theory:

Name of the Contents	Hours
1. Principles of Drawing Specific Objective ➢ Use Instruments for drawing, Scales, Lines, & there applications. ➢ Draw a basic 2-D geometrical entities using CAD. 1.1 Drawing Instruments and their uses • Standard sizes of drawing sheets (ISO-A series • Letters and numbers (single stroke vertical) • Convention of lines and their applications. • Scale (reduced, enlarged & full size) plain scale and diagonal scale. • Dimensioning technique as per SP-46 (Latest edition) – types and applications of chain, parallel and coordinate dimensioning 1.2 Introduction to CAD software (Basic commands like draw, modify). • Advantages of CAD • Geometrical constructions	**06**
2. Engineering Curves & Loci of Points. Specific Objective ➢ Draw Conic curves, involute, Cycloid & know their applications ➢ Draw helix, spiral, & loci of points from given data. 2.1 Conic Section • To draw an ellipse by Arcs of circle method & Concentric circles method. • To draw a parabola by Directrix and focus method &Rectangle method • To draw a hyperbola by Transverse Axis and focus method & rectangular hyperbola (Inclined axes). 2.2 Engineering curves • To draw involutes of circle & pentagon, • To draw a cycloid, epicycloids, hypocycloid • To draw Helix & Archimedean spiral. • Loci of points on any link of (i) 4 bar mechanism and (ii) Single slider crank mechanism with given specifications.	**09**
3. Orthographic Projections Specific Objective ➢ Visualize, interpret & draw orthographic views from given pictorial view. • 3.1 Introduction to Orthographic projections. • 3.2 Conversion of pictorial view into Orthographic Views (First Angle Projection Method Only) – elevation, plan and end view • 3.3 Selection of section plains and drawing sectional view (simple object)	**08**
Chapter 4. Isometric Projections Specific Objective ➢ Visualize interpret & draw isometric view from given orthographic views • 4.1 Isometric scale, comparison of true scale with isometric scale • 4.2 Conversion of orthographic views into isometric View / projection	**09**
Total	**32**

Practical:
Skills to be developed for practical:
Intellectual skills:

1. To develop ability to solve problems on geometrical constructions.
2. To develop ability to differentiate between conic and curves
3. Able to interpret the given mechanisms and locus of points.
4. Develop ability to interpret first angle projection method.
5. To interpret and able to solve problem on orthographic projection of given object.
6. Develop ability to differentiate between isometric view and isometric projections.
7. To differentiate between Isometric scale and true scale

Motor Skills:

1. To develop ability to draw the geometrical constructions by computer. Using CAD
2. To develop ability to draw different types of curves.
3. Develop ability to draw orthographic projections by first angle projection method
4. Develop ability to draw isometric views and isometric projections from given orthographic views of an object using computer.

List of Practical:

List of Practical
1.Geometrical Constructions Using CAD - (1 Sheet) Using CAD, draw the following figures with dimensions- Rectangle, circle, pentagon, hexagon, and two composite figures involving tangential exercises.
2. Engineering curves &Loci of points - (1 Sheet) i) Three different curves are to be draw using any one method. ii) Draw locus of point on anyone mechanism
3. Orthographic projections - (Total 2 Sheets) Two objects by first angle projection method – - Full orthographic views -One sheet - Sectional orthographic views–One sheet
4. Isometric projection - (Total 2 sheets) - Isometric views of two objects- One sheet - Isometric projection of two objects – One sheet

Learning Resources:
1. Books:

Sr. No.	Author	Title	Publication
1	N. D. Bhatt	Engineering Drawing	Charotar Publishing House 2010
2	Amar Pathak	Engineering Drawing	Dreamtech Press, 2010
3	D.Jolhe	Engineering Drawing	Tata McGraw Hill Edu., 2010
4	M.B.Shah, B.C.Rana	Engineering Drawing	Pearson, 2010

5	R. K. Dhawan	Engineering Drawing	S. Chand Co., Reprint 2010
6	K. L. Narayan, P. Kannaiah	Text Book on Engineering Drawing	Scitech Publications, 24th Reprint August 2011
7	K. Venugopal	Engineering Drawing and Graphics + AutoCAD	New Age Publication, Reprint 2006
8	IS Code, SP – 46	Engineering Drawing Practice for schools and colleges	--

2. Video Cassettes / CD's

1. Instructional / Learning CD developed by ARTADDICT.

Course Name: Diploma in Textile Manufactures, Textile Technology and Fashion & Clothing Technology

Course Code : TX / TC / DC

Semester : First

Subject Title : Elements of Textile Technology

Subject Code : 17008

Teaching and Examination Scheme

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	02	50 #*	--	--	25 @	75

 # External @ Internal #* On line examination

Rationale:

Textile has evolved from the basic need of mankind i.e. clothing. Today Textile Technology has been divided in to four distinct branches namely Yarn forming, Fabric forming, Wet processing and Garment manufacturing.

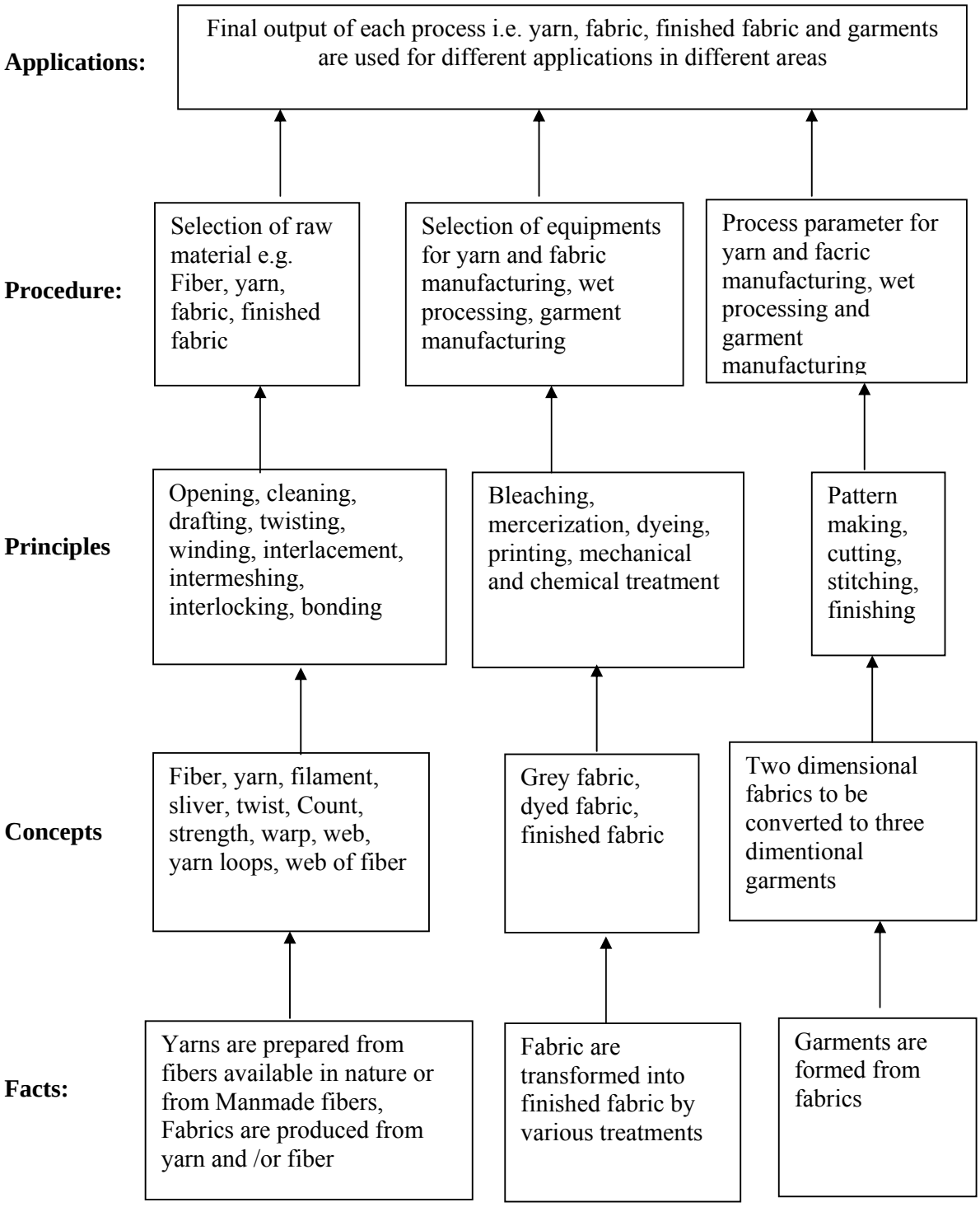
Elements of Textile Technology subject is introduced in the first semester to make the students familiar with the textile field. Basic aim of the subject is to give a brief idea regarding various areas associated with textiles. This will prepare students to understand various subjects regarding yarn and fabric manufacturing, wet processing and garment manufacturing during higher semesters.

General Objectives:

The students will be able to:

1) Understand various areas associated with the Textiles
2) Understand various methods of yarn and fabric manufacturing.
3) List various processes involved in wet processing and garment manufacturing.
4) Know various applications of textiles.
5) Draw flow charts for yarn and fabric forming ,wet processing and garment manufacturing

Learning Structure:



Theory:

Topic and Contents	Hours	Marks
TOPIC 1: Overview of Textile Processes: **Specific objectives:** ➢ **Get overall view of textile processes** • Concept of textiles. • Flow chart of conversion of fiber to garment, Major processes.	**02**	**--**
TOPIC2: Elements of Yarn Manufacturing **Specific objective:** ➢ **Identify different fibres** ➢ **Describe flow charts in spinning** • Definition of the terms: Textile fibres, staple yarn and filament. • Classification of textile fibres. • Properties of textile fibres: Essential and Desirable properties • Definition, objectives and principles of spinning preparatory processes– Blow room, Carding, Drawing, Combing and Roving • Definition, objectives and principles of various spinning systems, like ring spinning, rotor spinning. • End uses of yarns produced by these systems. Post spinning Processes – Winding only • Process flow for manufacturing of Carded Yarns, Combed Yarns,	**16**	**14**
TOPIC3: Elements of Fabric Manufacturing: **Specific objectives:** ➢ **Identify major fabric types.** ➢ **Describe flow charts of weaving process.** • Definition, objectives and Principles of various methods of fabric forming –weaving, knitting, non- woven. • End uses of fabrics produced by these methods. • Definition, objectives and Principles of various preparatory processes in weaving, warping, sizing, drawing –in, pirn winding. • Process Flow of Mono colored, striped and checks fabric. • Type of looms used for weaving - hand-loom, non automatic loom, automatic loom, shuttle less looms(projectile, rapier, air jet, water jet loom)	**16**	**16**
TOPIC4: Elements of Wet Processing **Specific objectives:** ➢ **Differentiate between major chemical processes of fabrics.** ➢ **Describe process flow charts in wet processing** • Flow process chart of wet processing. • Definition, objectives and Principles of wet processing: De-sizing, Scouring, Bleaching, Mercerization, Dyeing, Printing, Finishing.	**06**	**12**

TOPIC5: Elements of Garment Manufacturing: **Specific objectives:** ➢ **Understand the flow charts & working in garment manufacturing** • Process Flow chart for Garment Manufacturing- Woven and Knitted • Definition, Objectives and Principles of Pattern making, Sewing, Finishing of garments.	**08**	**08**
	48	**50**

Assignments:

Intellectual Skills:

1. Identify the various raw materials used for different Textile Manufacturing methods.
2. Select different raw material as per application or end use.
3. Identify different machines used for different manufacturing process.
4. Identify uses of Textiles.

Motor skills:

1. Draw process flow charts for yarn manufacturing.
2. Draw process flow charts for Fabric Manufacturing.
3. Draw process flow charts for Chemical process.
4. Draw process flow charts for Garment Manufacturing.
5 Collect samples.

List of Assignments:

1 Visit to spinning mill: General study of spinning unit and object of each process. Draw Process flow charts for carded and combed yarn.

2 Collection of samples of different types of fibers and yarns. Their market prices and application.

3 Visit to composite weaving unit: General study of weaving and weaving preparatory. Object of each process. Flow charts for a) Mono coloured b) Stripe and c) Check fabrics

4 Collection of samples of different types of fabrics. Their market prices and end uses

5 Visit to a processing unit: General study of various processes involved in wet processing. Object of each process. Flow chart for Bleached, dyed, printed fabrics.

6 Collection of samples of bleached, mercerized, dyed and printed fabrics. Their market prices and end uses.

7 Visit to a Garment manufacturing unit: General study of various processes involved in garment manufacturing. Object of each process Flow charts for garment manufacturing.

8 Collection of samples of various accessories for garments like buttons, zippers, labels, lace, machine needles, various threads etc.

Learning Resources:

1. Books:

Sr. No.	Author	Title	Publication
1	H.V.S. Murthy	Introduction to Textile Fibers	Textile Association of India Mumbai.
2	T.K. Pattabhiram	Essential Elements of Practical cotton spinning	Somaiyya Publication Pvt.Ltd. Mumbai
3	Bernard P. Cobman	Fibre to Fabric	MaGraw –Hill Book Company 6th Edition
4	P.R.Lord M.H.Mohamed	Weaving- Conversion of yarn to fabric	Wood head Publication limited
5	Peter Schwartz Travor Rhates Mansour Mohamed	Fabric Forming Systems	Noyes Publication Mahajan Book Distributers, Ahmedabad
6	M.K. Talukdar	Winding and Warping	--
7	M.K. Talukdar D.B. Ajgaonkar V.R.Wadekar	Sizing Materials, Methods, Machines	Textile Trade Press, Ahmedabad.
8	V. A. Shenai	Technology of Bleaching &Mercerzation	Sevak Publication, Wadala, Mumbai.
9	V. A. Shenai	Technology of Dyeing	Sevak Publication, Wadala, Mumbai.
10	V. A. Shenai	Technology of Printing	Sevak Publication, Wadala, Mumbai.
11	V. A. Shenai	Technology of Finishing	Sevak Publication, Wadala, Mumbai.
12	Herald Karr Barbara Latham	Technology of Clothing Manufacturing	Blackwell Science Ltd.
13	Helen Joseph Armstrong	Pattern Making for Fashion Designing	Dorling Kinersley (India) Pvt. Ltd. New Delhi.

Course Name: Diploma in Textile Manufactures, Textile Technology and Fashion & Clothing Technology

Course Code : DC / TC / TX

Semester : First

Subject Title : Basic Workshop Practice

Subject Code : 17009

Teaching and Examination Scheme:

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

 # External @ Internal #* On line examination

Rationale:

Diploma holder in Textile Engineer Group is expected to develop basic workshop skills such as wood working, Welding and sheet metal.

Students are require to identify, select and use proper material and also different kinds of tools, such as marking, measuring,, cutting, supporting, striking and various holding devices. These workshop practices are commonly used in engineering industries.

This subject develops basic hand skills and work culture much needed in handling more complex machinery and equipment.

Objectives: The student will able to

- Know basic workshop processes.
- Read and interpret job drawing.
- Identify and select the proper material for the job undertaken.
- Identify, select and use various marking, measuring, holding, striking and cutting tools & equipments.
- Operate, control different machines and equipment in respective shops.
- Produce and inspect the job for specified dimensions
- Adopt safety practices while working on various machines.

Skill to be developed:

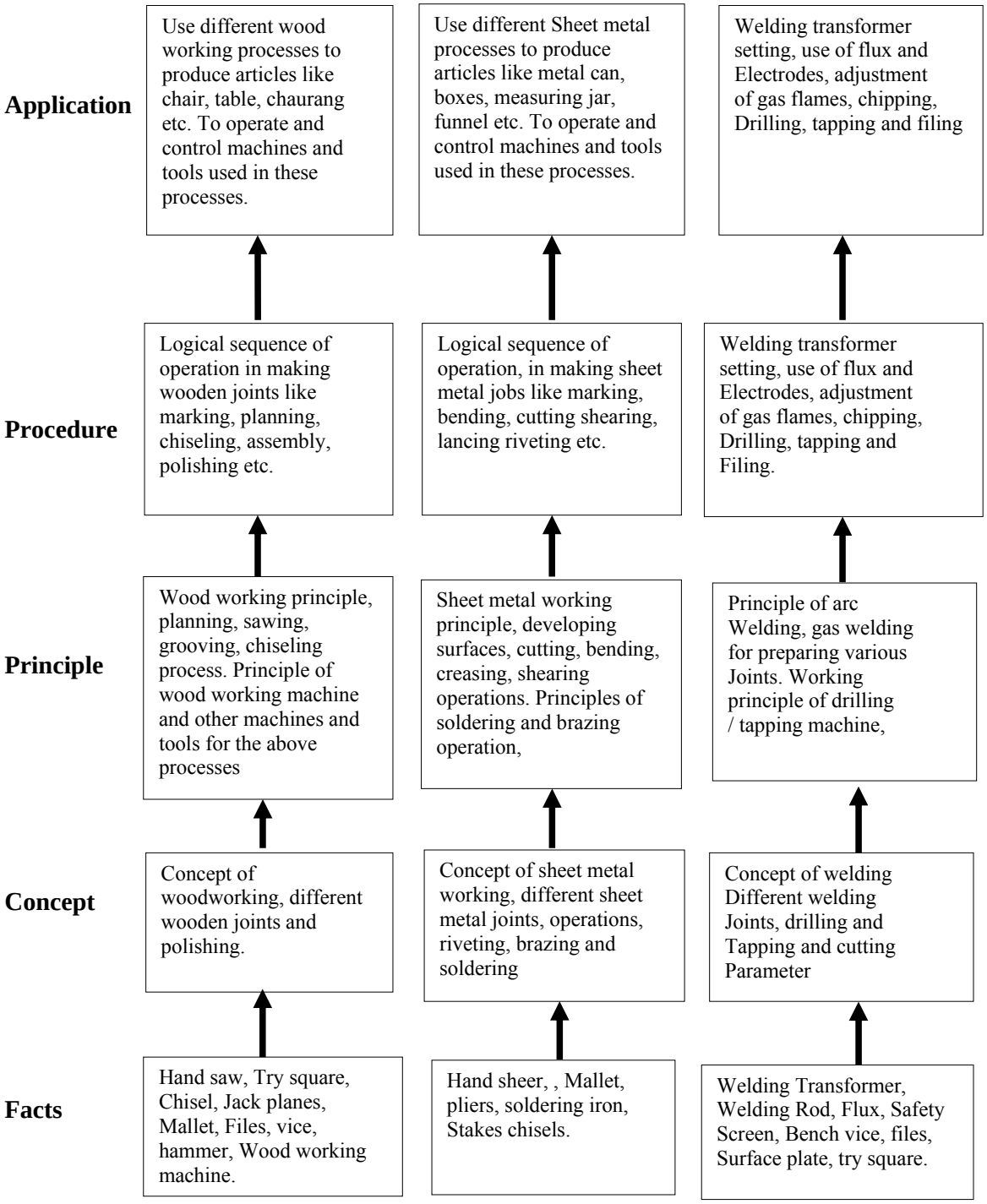
Intellectual Skills:

1. Ability to read and interpret job drawing
2. Ability to identify and select proper material, tools, equipments and machines.
3. Ability to select proper operational parameters
4. Ability to select proper measuring instruments.

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.

Leaning Structure



List of Practical:

	Hours
1. WOOD WORKING SHOP:----------10 hrs • Demonstration of different wood working tools and machines. • Demonstration of different wood working processes, like planing, marking, chiseling, grooving, turning of wood etc. One simple job involving any one joint like mortise and tenon, dovetail, bridle, half lap etc (for each student)	**10**
2. WELDING SHOP :---------- **08 hrs** • Demonstration of different welding tools / machines. • Demonstration on Arc Welding, Gas Welding, gas cutting and rebuilding of broken parts with welding. • One simple job involving butt and lap joint. (For each student)	**08**
3. SHEET METAL SHOP:----------14 hrs • Demonstration of different sheet metal tools / machines. • Demonstration of different sheet metal operations like sheet cutting, bending, edging, end curling, lancing, soldering and riveting. • One simple job involving sheet metal operations and soldering and riveting. (For each student) • 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) [Batch size should be selected depending on volume of work. Job allotted should comprise of 4-6 hours of actual working. Student shall calculate the cost of material and labor cost required for their job from the drawing.]	**14**

Notes:

1] The subject teacher should provide necessary theory inputs to students of all shops before their actual practical.

2] The instructor shall give demonstration to the students by preparing a specimen job as per the job drawing.

3] The workshop diary shall be maintained by each student duly signed by instructor of respective shop

4] Workshop Tool Manual at institute level shall be provided to the students

5] Out of 50 marks allotted for term work, 40 marks are for actual jobs completed and 10 marks for Diary.

Learning Resources:

Books:

- S.K. Hajara Chaudhary- Workshop Technology-Media Promotors and Publishers, New Delhi
- B.S. Raghuwanshi- Workshop Technology- Dhanpat Rai and sons, New Delhi
- H.S.Bawa- Workshop Practice- Tata McGraw Hill Publishers,New Delhi
- Kent's Mechanical Engineering Hand book- John Wiley and Sons, New York
- Electronics Trade & technology Development Corporation.(A Govt. of India undertaking) Akbar Hotel Annex, Chanakyapuri, New Delhi- 110 021
- Workshop Manual by P. Kannaiah and K. L. Narayana , SCITECH Publications

CDs

- Learning Materials Transparencies and CDs, CBT Packages developed by N.I.T.T.E.R. and other organizations.

Websites

- Refer website www.npkauto.com for Workshop Tool Manual