MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

TEACHING AND EXAMINATION SCHEME

COURSE NAME : DIPLOMA IN TEXTILE TECHNOLOGY

COURSE CODE : TC

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

SEMESTER : SIXTH **DURATION : 16 WEEKS**

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

SR. NO	SUBJECT TITLE	Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME									SW (17600)
							PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		
				TH	TU	PR		Max	Min	Max	Min	Max	Min	Max	Min	
1	Management $	MAN	17601	03	--	--	1&½	50#*	20	--	--	--	--	--	--	
2	Environmental Aspects & Safety in Chemical Processing	EAS	17686	03	--	--	03	100	40	--	--	--	--	--	--	
3	Testing of Dyes and Chemicals	TCT	17687	02	--	03	02	50	20	50#	20	--	--	25@	10	
4	Textile Process Planning & Management	TPP	17688	03	--	03	03	100	40	--	--	--	--	25@	10	**50**
5	Processing of Specialty Fabrics & Garments	PSF	17689	03	--	03	03	100	40	--	--	--	--	50@	20	
6	Behavioral Science $	BSC	17075	01	--	02	--	--	--	--	--	25#	10	25@	10	
7	Project & Seminar	PAS	17814	--	--	04	--	--	--	--	--	50#	20	50@	20	
			TOTAL	**15**	**--**	**15**	**--**	**400**	**--**	**50**	**--**	**75**	**--**	**175**	**--**	**50**

Student Contact Hours Per Week: **30 Hrs.**

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.

Total Marks **: 750**

@ Internal Assessment, # External Assessment, $ Common to All Conventional Diploma, [ ] No Theory Examination, β - Common to TX

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

- Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subject are to be converted out of 100 marks as sessional work (SW).
- Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms.
- Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code.

Course Name : All Branches of Diploma in Engineering / Technology

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

Semester : Sixth for EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ME/PG/PT/AE/CE/CS/CR/ CO/CM/IF/CW/EE/EP/EU/CH/CT/PS/TX/TC/FG and Seventh for MH/MI/CD/ED/EI/ CV/FE/IU

Subject Title : Management

Subject Code : 17601

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	--	1&½	50#*	--	--	--	50

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:

Management concepts are universal and it is a multidisciplinary subject. They are equally applicable to different types industries like Manufacturing, Service and Trade as well as different kind of business activities like industry, army, school, hospital, retail shops etc. Also, at the end of diploma course polytechnic students are expected to enter in to the Industrial Environment. This environment is altogether different and new to the students. A proper introduction and understanding of management fundamentals is therefore essential for all these students.

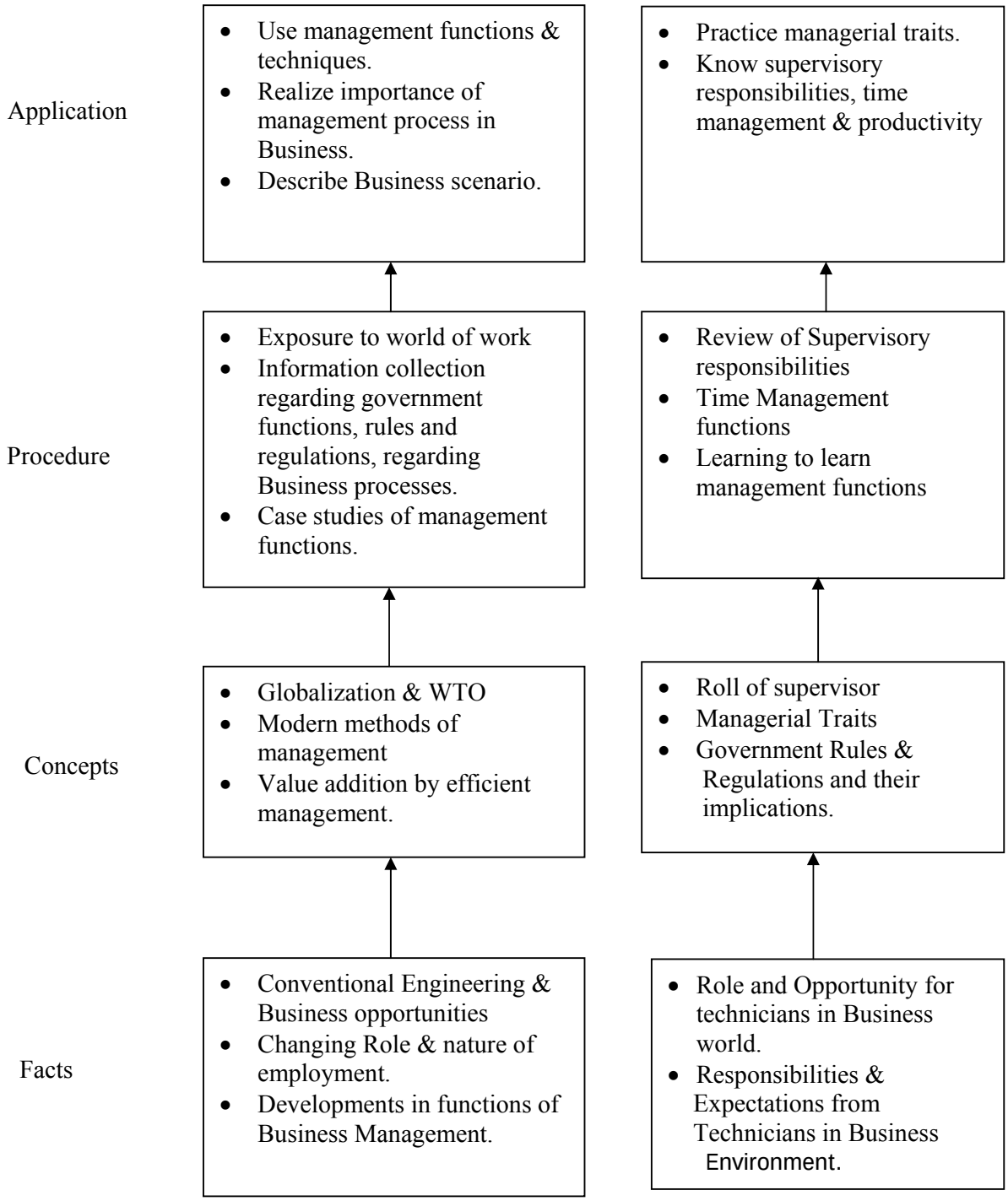
Contents of the this subject will enable the students to address various issues related to human resource, finance, materials, legislations etc. by use of basic principles of management. This will ensure that students will play their role effectively to enhance the quality of business output in total.

Objective:

The students will able to:

1. Get familiarized with environment related to business processes.
2. Know the management aspects of the organisations.
3. Understand Role & Responsibilities of a Diploma engineer.
4. Understand importance of quality improvement techniques.
5. Appreciate need and importance of safety in industries.
6. Understand process of Industrial finance and its management.
7. Know the latest trends in industrial management.

Learning Structure:



Contents: Theory

Topic and contents	Hours	Marks
Topic 1: Overview of Business **Specific Objectives** ➢ State various business types and sectors ➢ Describe importance of globalisation 1.1. Types of Business • Service • Manufacturing • Trade 1.2. Industrial sectors Introduction to • Engineering industry • Process industry • Textile industry • Chemical industry • Agro industry • IT industry • Banking, Insurance, Retail, Hospitality, Health Care 1.3 Globalization • Introduction • Advantages & disadvantages with respect to India	02	04
Topic 2: Management Process **Specific Objectives** ➢ State various management principles ➢ Describe different management functions 2.1 What is Management? • Evolution • Various definitions of management • Concept of management • Levels of management • Administration & management • Scientific management by F.W.Taylor 2.2 Principles of Management (14 principles of Henry Fayol) 2.3 Functions of Management • Planning • Organizing • Directing • Controlling • Decision Making	08	08
Topic 3: Organisational Management **Specific Objectives** ➢ Compare different forms of organisation , ownership for a specific business ➢ Describe types of departmentation 3.1 Organization: • Definition • Steps in organization	08	08

3.2 Types of organization • Line • Line & staff • Functional • Project 3.3 Departmentation • By product • By process • By function 3.4 Principles of Organisation • Authority & Responsibility • Span of Control • Effective Delegation • Balance, stability and flexibility • Communication 3.5 Forms of ownership • Proprietorship • Partnership • Joint stock • Co-operative Society • Govt. Sector		
Topic 4: Industrial Safety and Legislative Acts **Specific Objectives** ➢ Describe types of accidents & safety measures ➢ State provisions of industrial acts. 4.1 Safety Management • Causes of accidents • Types of Industrial Accidents • Preventive measures • Safety procedures 4.2 Industrial Legislation - Necessity of Acts Important Definitions & Main Provisions of following acts: • Indian Factory Act • Workman Compensation Act • Minimum Wages Act	08	06
Topic 5: Financial Management (No Numerical) **Specific Objectives** ➢ Explain functions of financial management ➢ State the sources of finance & types of budgets. ➢ Describe concepts of direct & indirect taxes. 5.1 Financial Management- Objectives & Functions 5.2 Capital Generation & Management • Types of Capitals - Fixed & Working • Sources of raising Capital - Features of Short term, Medium Term & Long Term Sources 5.3 Budgets and accounts • Types of Budgets • Fixed & Variable Budget - Concept	08	08

• Production Budget - Sample format • Labour Budget - Sample format • Profit & Loss Account & Balance Sheet - Meaning, sample format, meaning of different terms involved. 5.4 Meaning & Examples of – • Excise Tax • Service Tax • Income Tax • Value Added Tax • Custom Duty		
Topic 6: Materials Management (No Numerical) **Specific Objectives** ➢ Describe concept of inventory, ABC analysis & EOQ. ➢ Describe purchase functions & procedures ➢ State features of ERP & MRP 6.1 Inventory Concept, its classification, functions of inventory 6.2 ABC Analysis - Necessity & Steps 6.3 Economic Order Quantity Concept, graphical representation, determination of EOQ 6.4 Standard steps in Purchasing 6.5 Modern Techniques of Material Management • Material Resource Planning (MRP) - Functions of MRP, Input to MRP, Benefits of MRP • Enterprise Resource Planning (ERP) - Concept, list of modules, advantages & disadvantages of ERP	08	08
Topic 7: Quality Management **Specific Objectives** ➢ State Principles of Quality Management ➢ Describe Modern Technique & Systems of Quality Management 7.1 Meaning of Quality Quality Management System - Activities, Benefits Quality Control - Objectives, Functions, Advantages Quality Circle - Concept, Characteristics & Objectives Quality Assurance - Concept, Quality Assurance System 7.2 Meaning of Total Quality and TQM Components of TQM - Concept, Elements of TQM, Benefits 7.3 Modern Technique & Systems of Quality Management like Kaizen,5'S',6 Sigma 7.4 ISO 9001:2000 - Benefits, Main clauses	06	08
Total	**48**	**50**

Learning Resources:
Books:

Sr. No	Author	Name of Book	Publisher
01	Dr. O.P. Khanna	Industrial Engineering & Management	Dhanpat Rai & Sons New Delhi
02	Banga & Sharma	Industrial Engineering & Management	Khanna Publication
03	Dr. S.C. Saksena	Business Administration & Management	Sahitya Bhavan Agra
04	W.H. Newman E. Kirby Warren Andrew R. McGill	The process of Management	Prentice- Hall

E Source:

nptel.iitm.ac.in
http://iete-elan.ac.in/subjects/amIndustrialMgmt.htm

Course Name : Diploma in Textile Manufactures / Diploma in Textile Technology

Course Code : TX / TC

Semester : Sixth

Subject Title : Environmental Aspects & Safety in Chemical Processing

Subject Code : 17686

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:

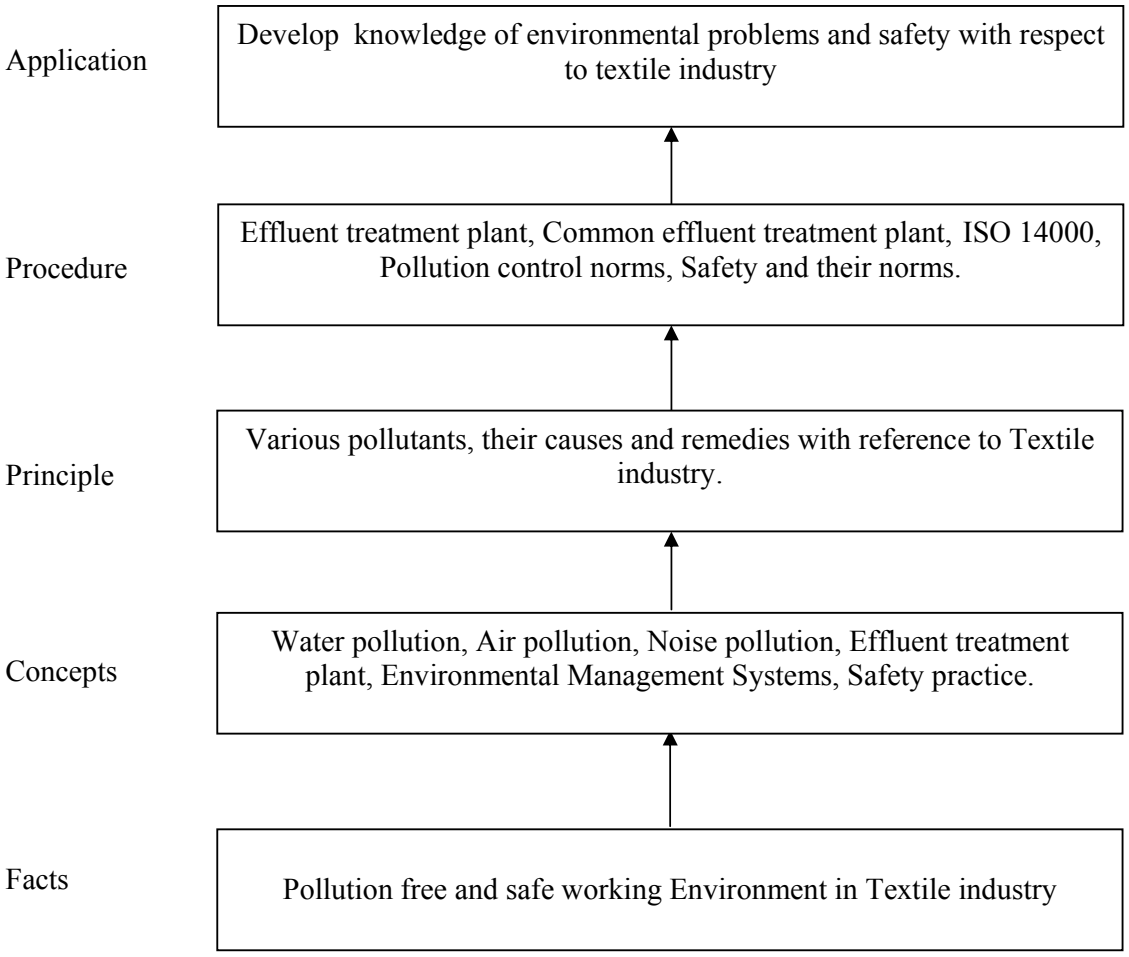
Textile industry is the second largest employer after agriculture and hence back bone of Indian economy. However Textile industry is a major source of all types of pollution like water, air and noise. Many ecological problems like global warming and ozone layer depletion. This issue has taken center stage of the world forum for last 50 years. There will be many restrictions globally to control carbon emission in the next 10 years for survival of mother earth. And hence student must be aware of the environmental problems created by textile industry and their solutions. Safety and well being of textile workers in general is always a major concern. Hence students should be aware about various safety practices and their importance in textile industry.

General Objectives:

The students will be able to:

1. Know the various ecological problems faced by world with special reference to the textile industry.
2. Understand pollution caused by the Textile industry and their solution.
3. Understand safety practices and their importance in textile industry.

Learning Structure:



Contents: Theory

Topic and Contents	Hours	Marks
Topic 1: Introduction of Environmental Aspects: **Specific objectives:** ➢ State various effluent parameters ➢ State environmental standards **Contents :** • Current Eco system problems like global warming, ozone layer depletion, deforestation etc. • Definition of Pollution, Types of Pollution & its effects. • Toxicological aspects in chemical processing • Concepts of ISO 14000 series • Definition of BOD, COD, TDS, TSS and DO.	08	16
Topic 2: Water Pollution: **Specific objectives:** ➢ Describe effect of Textile Processing on water pollution and its impact on human & aquatic life. **Contents:** • Effect of water pollution on human health and aquatic life. • The effect of various Textile chemical processes like Desizing, Scouring, Bleaching, Mercerization, Dyeing, Printing and Finishing on water pollution and its remedies.	10	20
Topic 3: Air Pollution: **Specific objectives:** ➢ Describe effect of Textile Processing on Air pollution and its impact on human life. **Contents:** • Various Air Pollutant emitted by textile industry, Greenhouses gases. • Effect of air pollution on human health and vegetation. • Remedies to control the air pollution. • Plume behavior.	06	12
Topic 4: Noise Pollution: **Specific objectives:** ➢ Describe effect of Textile Processing on Noise pollution and its impact on human life and working. **Contents:** • Sources of noise in textile industry and effect on human health and efficiency • Methods of reducing noise in textile industry	05	08
Topic 5: Effluent Treatment **Specific objectives:** ➢ Describe various steps involved in ETP and concepts of CETP. **Contents:** • Basic concepts and design of effluent treatment plant in textile industry.	07	16

• Modern methods of Effluent Treatment Plant like R.O, Multi evaporators. • Concept of Common effluent treatment plant		
Topic 6: Testing of Effluent **Specific objectives:** ➢ State the Testing of various Effluent Parameters. **Contents:** • Definition and Testing of BOD, COD, TDS, TSS and their Norms as per the pollution control board.	04	08
Topic 7: Hazards in Textile Industry **Specific objectives:** ➢ State factors responsible for fire and accidents and its remedies **Contents:** • Factors responsible for various accidents and methods to control them. • Fire and accidents in Textile industry, remedies to overcome the same.	04	10
Topic 8: Safety in chemical processing industry **Specific objectives:** ➢ Describe various safety parameters like electric and chemical safeties. **Contents:** • Electrical safety, use of safety aids and tools • Different chemicals used in wet processing and their safety norms. • Occupational health and safety management in textile industry	04	10
Total	**48**	**100**

Learning Resources:

Sr. No.	Author	Title	Publisher
1	Edited by Y Wang	Recycling in Textiles	Wood head Publishing Series in Textiles No. 50
2	Textile Committee	Eco friendly Textile challenges to textile industry	Textile committee
3	V. A. Shenai	Ecology and Textiles	Sevak Publishing company
4	Samiya Ahmed	Health and Safety in the Textile Dyeing Industry	Stockholm Environment Institute
5	Ms. Ilse Hendrickx	A report on Pollution prevention studies in the Textile wet processing industry	Department of environmental quality Office of pollution prevention, Virginia 23240
6	Textile Committee	Occupational safety and health in Textile Industry	Textile Committee
7	Prof. S. Udhayamarthandan	Water, Effluent Treatments & Pollution Control	SSMITT Co-op Stores Publications.
8	Prof. S. Udhayamarthandan	Eco Friendly Processing	SSMITT Co-op Stores Publications.

Course Name : Diploma in Textile Technology

Course Code : TC

Semester : Fifth

Subject Title : Testing of Dyes and Chemicals

Subject Code : 17687

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
02	--	03	02	50	50#	--	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:

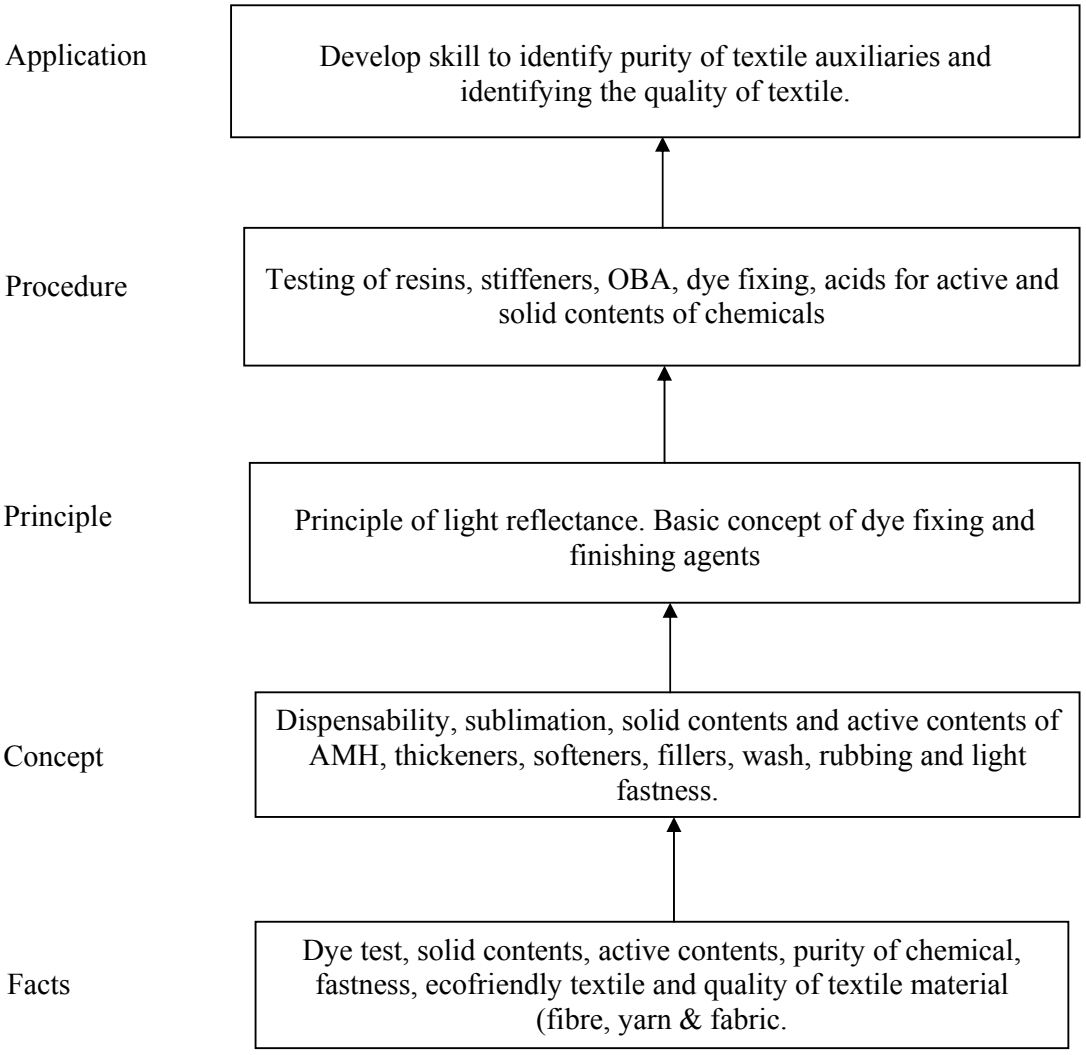
Like any other textile manufacturing processes chemical treatment of textiles involves the use of raw material, men, money and machine with lot of other things. As such, the processes in the chemical processing must be managed to give the best performance with respect to production, quality, and the cost of production. In today's competitive world it is very essential to achieve very high standards of quality of the finished product. Therefore the testing of raw material (textiles and chemicals), intermediate products and the final product becomes important aspect of the process. This subject intends to impart the knowledge and skill to the students in this area.

General Objectives:

The students will be able to:

1. Understand various tests of dyes
2. Understand various tests of auxiliaries (Used for pretreatment, dyeing, printing and finishing)
3. Understand testing of textile after processing.
4. Understand quality control norms.

Learning Structure:



Contents: Theory

Topic and Contents	Hours	Marks
Topic 1: Testing of Dyes Specific Objectives: ➢ State importance of testing ➢ Describe testing procedures for various qualities of dyes Contents: • Importance of testing, • Dye-stuff performance tests: migration test, critical temperature test, levelling test, dispersibility test, • Stripping of various types of dyes.	08	12
Topics 2: Testing of Chemicals Specific Objectives: ➢ Describe procedures for testing chemicals Contents: **Chemicals** • Quantitative estimation of acetic acid, caustic soda, hydrogen peroxide, sodium hydrosulphite, **Softeners & Binders** • Performance by application method, • Evaluation of synthetic stiffeners – performance test. • Description of evaluation of binder for determination of stability & pH	10	14
Topics 3: Testing of Textile Auxiliaries Specific Objectives: ➢ Describe procedures for testing auxiliaries Contents: **Pretreatment and colouration Auxiliaries** • Detection of nature & type (ionic, non-ionic, amphoteric) of auxiliaries. • Testing of sequestering agents for determination of chelating value. • Testing of wetting agent (performance). • Testing of cationic dye-fixing agents by application methods. • Testing of carriers for performance by dyeing method. • Testing of dispersing agent. • Testing OBA by titration and spectrophotometric techniques. **Finishing Textile Auxiliaries** • Testing of auxiliaries for determination of solid content. • Testing of resin for free formaldehyde, total formaldehyde content & Performance test. • Qualitative & quantitative analysis of thickeners (appearance, moisture content, pH, free alkali, ash content, viscosity).	14	24
Total	**32**	**50**

Practical:
Skills to be developed:

Intellectual Skills:

1) Identify dyes on fibre.
2) Analyse pure chemicals.
3) Analyse textile auxiliaries

Motor Skills:

1) Washing, light, sublimation, rubbing & perspiration fastness.
2) Titration method to analyze pure chemicals.

List of Practicals:

1) Determination of washing fastness.
2) Determination of Light fastness.
3) Determination of perspiration fastness
4) Determination of rubbing fastness.
5) Determination of sublimation fastness.
6) Identification of Dyes (Direct, Reactive, Sulphur)
7) Identification of Dyes (Vat, Azoic, Basic)
8) Identification of Dyes on fibres.
9) Determination of relative strength of dye using computer colour matching.
10) Determination of percent purity of H2O2.
11) Evaluation of wetting agent by performance test
12) Evaluation of levelling agent by performance test

Learning Resources:
Books:

Sr. No.	Author	Title	Publisher
1	Girish Lithra & Bapu Deshpande	Process House Laboratory - A Hand Book	Mantra, Surat
2	Dr. V.A. Shenai	Chemistry of Organic Textile Auxiliaries Vol. V	Sevak Publications
3	Dr. N. F. Desai	Profiles In Analysis Of Chemicals	Colour Publications Pvt. Ltd.
4	Dr. V. A. Shenai & R.H. Mehra	Evaluation of Textile Chemicals	Sevak Publication
5	W. Cramer	Textile Laboratory Manual	Lond Heywood Books
6	S. R. Trotman	Textile Analysis	Charles Goriffin And Company Ltd.

Course Name : Diploma in Textile Technology

Course Code : TC

Semester : Sixth

Subject Title : Textile Process Planning & Management

Subject Code : 17688

Teaching & Examination Scheme:

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

NOTE:

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

Rationale:

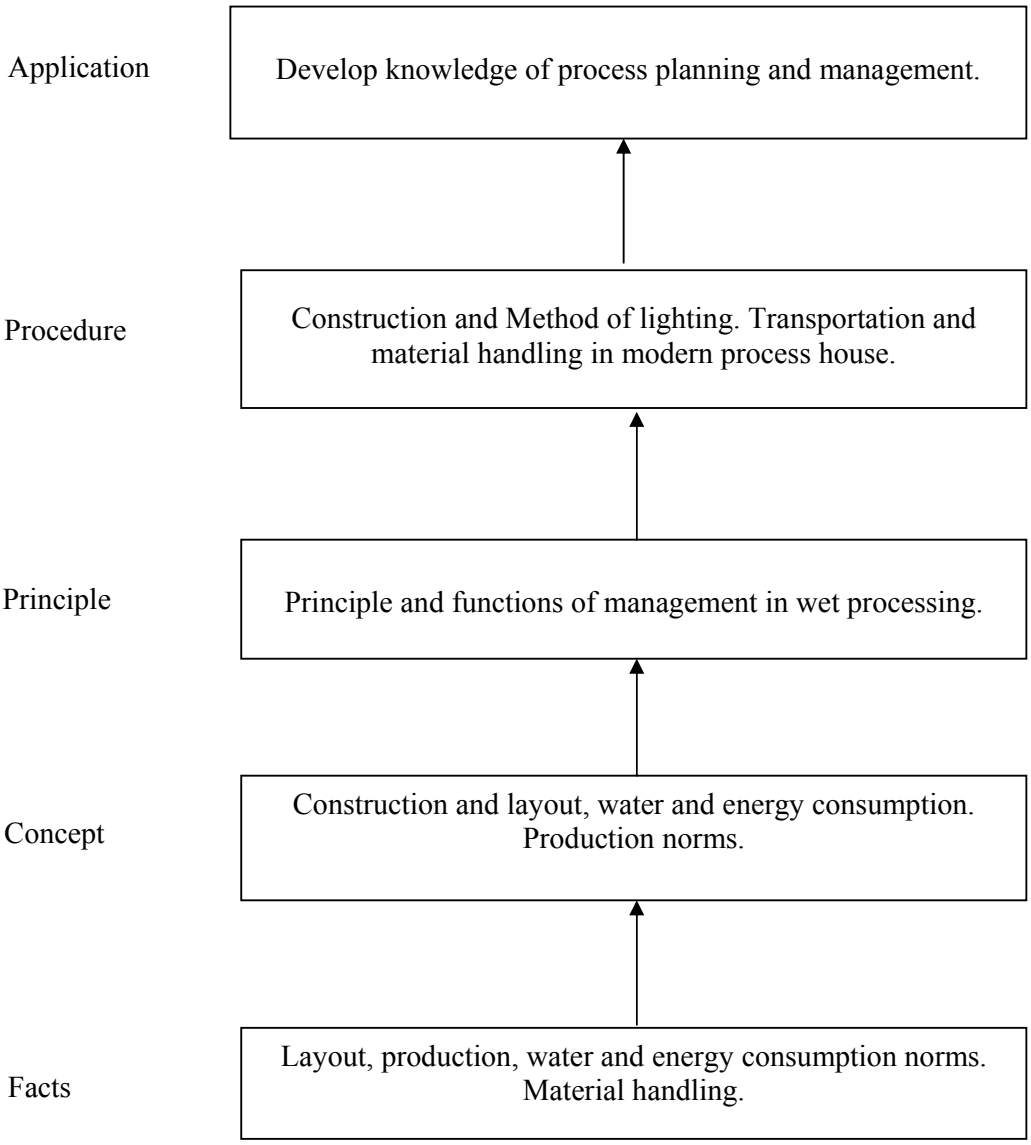
The chemical processing of textiles is a part of textile manufacturing process, which has various types of machines, which treat the fabric in stages to give desired properties or finishes suitable for particular use. To get optimum performance of various machines in the section, planned layout of machine is very important. The flow of material and the fluids or chemicals are important, which depends on good layout of machines and other ancillaries. The material handling is one of the important aspects of manufacturing process. The processing technologist should have knowledge of these aspects too.

General Objectives:

The students will be able to:

1. Understand of construction and planning of dye house.
2. State production norms for varies stages of processing.
3. Describe material handling and safety in textile industry.

Learning Structure:



Contents: Theory

Topic and Contents	Hours	Marks
Topic 1: Construction, Planning and Lay Out of Dye House: Specific Objectives: ➢ Draw layout of machinery ➢ Describe different construction types ➢ Analyse parameters to be considered for selection of location Contents: • Plan for setting up of a modern process house. • Construction and layout of modern process house. • Selection of location and site for modern process house.	07	16
Topics 2: Machine Production Norms Specific Objectives: ➢ State production norms of conventional and modern machines ➢ Calculate working efficiency and machine efficiency ➢ Calculate production of processing machines Contents: • Production norms/machine/shift. • Production norms for singeing, scouring, bleaching and mercerization machine. • Norms of production on jigger, jet, soft flow and continuous dyeing machine. • Production norms for flat bed and rotary printing machine. • Production norms for stenter, drying ranges and decatising	10	20
Topics 3: Water Consumption Specific Objectives: ➢ Calculate water consumption norms per machine ➢ Describe steps to minimize consumption of water ➢ Calculate water consumption per machine and process Contents: • Consumption of water in pretreatment. • Consumption of water in dyeing. • Consumption of water in printing and finishing. • Measures to conserve and reuse water in process house.	10	20
Topics 4: Energy Consumption Specific Objectives: ➢ Calculate energy consumption norms per machine ➢ Describe steps to minimize consumption of energy ➢ Calculate energy consumption per machine and process Contents: • Various fuels used in dye house. • Consumption of energy in pretreatment. • Consumption of energy in dyeing. • Consumption of energy in printing. • Consumption of energy in finishing. • Measures to conserve energy in process house.	09	18

Topics 5: Lighting Requirements Specific Objectives: ➢ Describe lighting requirement in different department ➢ State types of lighting and requirements Contents: ➢ Norms of lighting at work place ➢ Position of lighting.	04	08
Topics 6: Material Handling & Industrial Safety Specific Objectives: ➢ State methods of material handling ➢ Describe effect of different construction aspect on safety ➢ Describe methods of chemical storage and internal transportation Contents: ➢ Material handling equipments & methods. ➢ Accidents and their causes in textile industry. ➢ Aspects of flooring, machinery, lighting drainage & maintenance for safety. ➢ Awareness of safety. ➢ Storage, transportation, and handling of different chemical used in wet processing and their safety measures.	08	18
Total	**48**	**100**

Practical:
Skills to be developed:

Intellectual Skills:

1. Analyzing the requirements of wet processing.
2. Understanding needs of material handling.

Motor Skills:

1. Drawing of different layouts.
2. Writing records of different utilities from processing unit.
3. Calculating amount of utilities used in processing.

List of Practicals:

1. Preparation of machine layout for package dyeing unit.
2. Preparation of machine layout for fabric processing unit.
3. Prepare ideal layout of modern processing unit.
4. Determine water consumption at shop floor for dyeing machines.
5. Determine electrical energy consumption for stenter machine.
6. Identify material handling equipments in wet processing with neat sketch.
7. Identify department-wise needs and consumption of lighting in wet processing.

8. Finding consumption and types of fuels in textile wet processing.
9. Determine need and present status of safety equipments used in wet processing.
10. Determine production cost for variety of qualities from wet processing.

Learning Resources:
Books:

Sr. No.	Author	Title	Publisher
1	James Park and John Shore	Dye House Management Manual	Multi-Tech Publishing Co. Mumbai-77
2	Fred E Meyers	Plant Layout and Material Handling	--
3	--	Norms for the Textile Industry Part-III	ATIRA, Ahmedabad
4	--	Norms in Textile Industry	ATRIA, BTRA, SITRA, NITRA

Course Name : Diploma in Textile Technology

Course Code : TC

Semester : Sixth

Subject Title : Processing of Specialty Fabrics & Garments

Subject Code : 17689

Teaching & Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS.	TH	PR	OR	TW	TOTAL
03	--	03	03	100	50#	--	25@	175

NOTE:

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

Rationale:

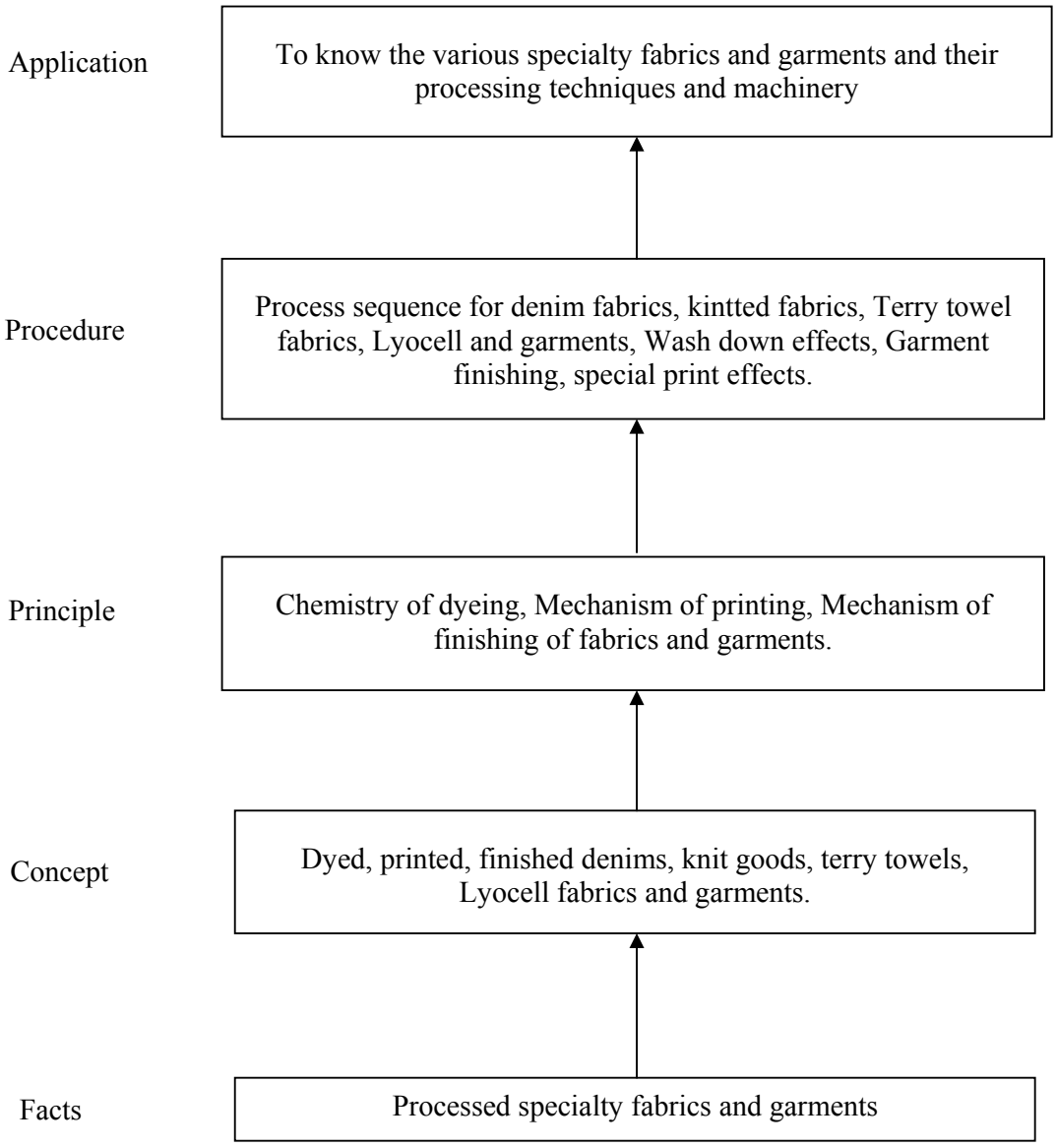
This subject deals with processing of speciality fabrics such as denims, knit goods, terry towels and garments. It also covers the processing of furnishing fabrics. It mainly deals with chemistry and processes of dyeing, Students will study process sequences, pretreatments, and finishing.

General Objectives:

Student will be able to:

1. Study and identify various types of specially fabrics
2. Understand the processing of various speciality fabrics
3. Know the chemistry and processes of dying

Learning Structure:



Contents: Theory

Topic and Contents	Hours	Marks
Topic 1: Processing of Denim **Specific objective:** ➢ Describe denims and types of denim fabrics ➢ Describe dyeing and finishing of denim fabric and garment **Contents:** • Introduction to denim, • Types of Denim fabrics, • Chemistry and process of warp dyeing with indigo, • Indigo dyeing equipments - sheet and rope form, • Dyeing with mixture of indigo and other dyes, • Finishing of Denim Fabrics and Garments: stone wash, enzyme wash, acid wash, Antique wash, sand blast wash	10	24
Topic 2: Processing of knit goods Specific objective: ➢ State concept of warp knits and weft knits ➢ Describe processing of knitted goods **Content:** • Process sequences in tubular and open width form, • Pretreatments - singeing, scouring, bleaching and mercerization on soft flow machine and winch • Dyeing with direct, reactive dyes • Chemical and mechanical finishing.	12	24
Topic 3: Processing of Terry Towel Specific objective: ➢ Describe structure and requirements of terry towel ➢ Describe process sequence and machinery for processing of terry towel **Contents:** • Structure and essential properties of terry towel fabrics like pile properties, water absorbancy • Process sequence and machines used for terry towel processing.	08	16
Topic 4: Garment Processing Specific objective: ➢ Describe working of garment processing machinery ➢ State application of various finishes and print effects on garments **Contents:** • Concept of pre-garment stage and garment stage processing • Pedal dyeing machine, Winch dyeing machine, Tumble dryer, Relax dryer, • Garment finishing: Mud wash, Ion wash, Chalk wash, Antimicrobial finish, Cool finish, Thermocat finish, Wrinkle free finish, Bio polishing • Various printing effects: Khadi printing, Flock printing, Plastisol printing, Pearl printing, Puff printing, Fluorescent printing.	10	24

Topic 5: Processing of Furnishing fabrics Specific objective: ➢ State properties of furnishing fabrics ➢ Describe processing of furnishing fabrics **Contents:** • General properties and uses of furnishing fabrics, • Pretreatment, dyeing and finishing of furnishing fabrics; • Defects in processing of furnishing fabrics - causes and remedies.	08	12
Total	**48**	**100**

Skills to be developed

Intellectual Skills:

1. Interpret type of finishing
2. Calculate recipe formulation

Motor Skills:

1. Measure the chemicals
2. Prepare solutions

List of Practicals:

1. Application of stone wash on denim fabric/ garment.
2. Application of acid wash on denim fabric/ garment.
3. Application of enzyme wash on denim fabric/ garment.
4. Dyeing of terry towel with reactive dye
5. Application of mud wash on cotton fabric or garment.
6. Application of chalk wash on cotton fabric or garment.
7. Application of ion wash on cotton fabric or garment.
8. Application of wrinkle free finish on cotton fabric or garment.
9. Floc printing on cotton fabric or garment
10. Fluorescent printing on cotton fabric or garment.

Learning Resources:

Books:

Author	Title	Year of Publication	Place of Publication & Publisher
J. T. Marsh	Textile Finishing	1986	B.I. Publications, Delhi,
Nalankilli	Textile Finishing	1998	Digital Impressions, 288-N, Salem, Main Road , Komarapalayam, 638183 (T.N.)
AATCC	Challenges & opportunities in garment processing.	1998	AATCC.
L.W.C. Miles	Textile Printing	1981	The Dyer Company Publication Trust

Course Name : All Branches of Diploma in Engineering & Technology

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

Semester : Fifth for EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ME/PG/PT/AE/CE/CS/CR/ CO/CM/IF/EE/EP/CH/CT/PS/TX/TC/DC and Sixth for CD/MH/IU/CV/FE/ FG/MI/DC/TC/TX

Subject Title : Behavioural Science

Subject Code : 17075

Teaching and Examination Scheme:

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

Rationale:

With increased globalization and rapid changing business expectations, employers are looking for wide cluster of skills to cater to the changing demand. Personality traits and soft skills are playing a key role in a student's career in this changing scenario. Corporate houses look for soft skills that supplement hard skills.

Addition of behavioural science in curriculum is intended to enhance the efficiency of a person so that he can contribute to overall growth of organisation. It aims at developing insight into leadership, team building, motivation, interpersonal relationship, problem solving, decision making and aspects of personality in a technician's profile. Addition of the topic of organizational culture will further mould him/ her in the organisational role.

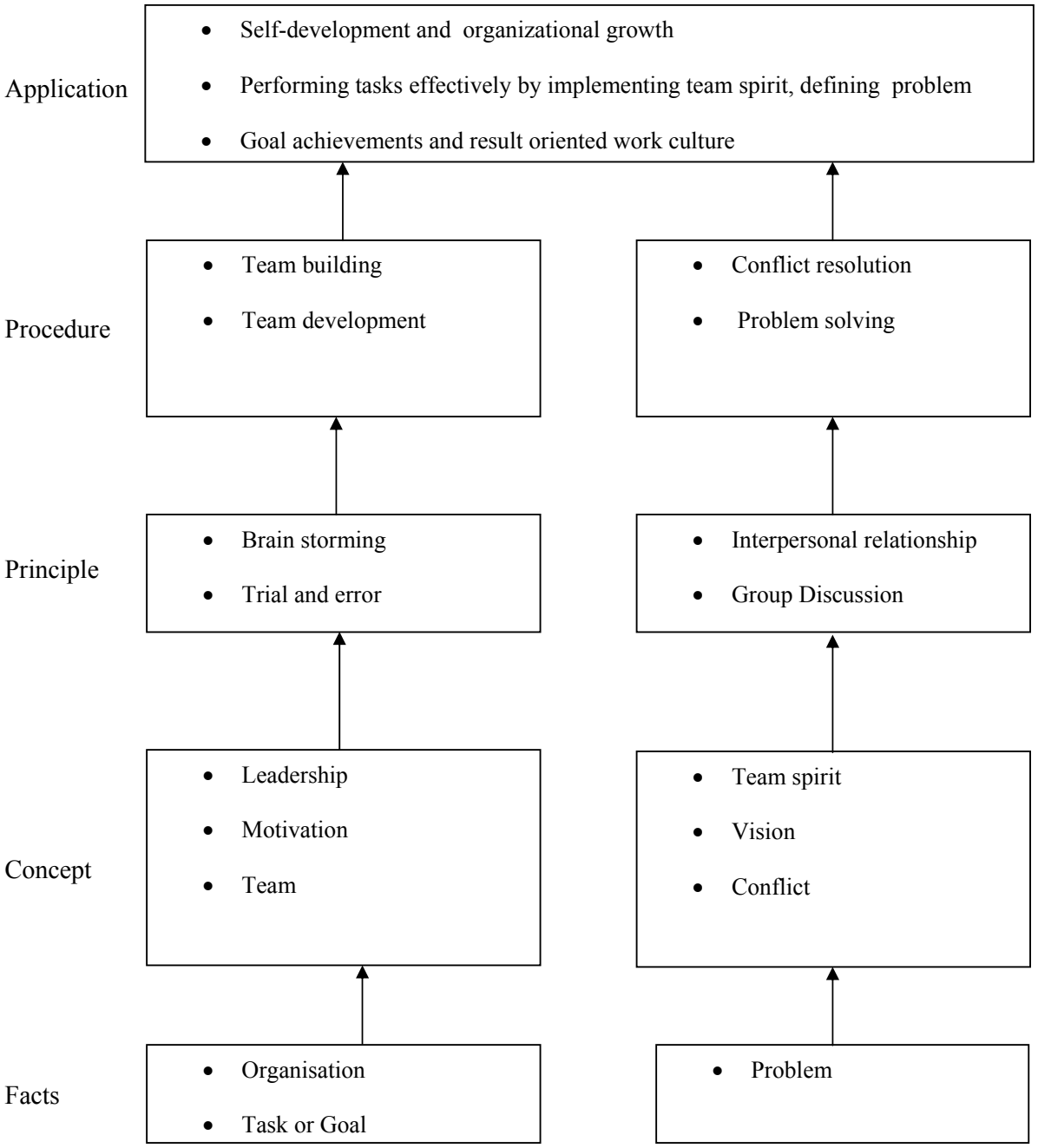
This subject of 'Behavioural Science' provides a broad base in which a technician can develop a successful career in the world of work.

General Objectives:

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

1. Develop him/her as Team leader.
2. Use self-motivation and motivate others.
3. Build a team and develop team spirit among the team members.
4. Improve the interpersonal relationship skills.
5. Learn Problem solving and decision making skills.
6. Discuss a particular topic in a group and face the interview.

Learning Structure:



Theory:

Topic and Contents	Hours
TOPIC 1: LEADERSHIP Contents: 1.1 Introduction – Importance, examples of different types of leaders. 1.2 Meaning and Definition of Leadership. 1.3 Leadership qualities – Confidence, Vision, Communication Skills, influencing people etc. 1.4 Types of Leadership styles, their advantages and disadvantages – Autocratic, Democratic, Delegative, Bureaucratic and Laizze Fairie.	02
TOPIC 2: MOTIVATION Contents: 2.1 Meaning and Definition of motivation. 2.2 Types of motivation. 2.3 Maslow's Motivation theory. 2.4 Job characteristic model to enhance motivation.	03
TOPIC 3: TEAM BUILDING Contents: 3.1 Definition of Team. 3.2 Difference between Group and Team. 3.3 Need for formation of good team (vision, trust, cooperation, initiative, etc.) 3.4 Approach to Team building (Personality based, activity based, skill based, problem solving based, etc.)	02
TOPIC 4: CONFLICT RESOLUTION Contents: 4.1 Definition of Conflict. 4.2 Types of Conflict – Functional and Dysfunctional 4.3 Sources of Conflict – Ego, Authority, Frustration etc. 4.4 Positive and Negative effects of conflicts. 4.5 Methods of Conflict resolution – Compromising, withdrawal, forcing.	04
TOPIC 5: PROBLEM SOLVING AND DECISION MAKING Contents: 5.1 Steps in Problem Solving. 5.2 Methods used for solving problems – trial and error method, brain storming, lateral thinking method. 5.3 Techniques used for Decision making- Decision tree, Decision Matrix, Mind Mapping etc.	03
TOPIC 6: GROUP DISCUSSION AND INTERVIEW TECHNIQUES Contents: 6.1 GROUP DISCUSSION • Objectives of Group Discussion (ability to work in team, speaking and listening skills, leadership, creativity) • Does and Don'ts of Group Discussion. • How to conclude Group Discussion. 6.2 INTERVIEW TECHNIQUES	02

• Types of Interviews. (patterned, stress, behavioural) • Dress Code, Body Language and Communication Skill. • Probable questions for Interview. • Telephonic or Video Interview.	
Total	**16**

Practical:
Skills to be developed:

Intellectual Skills:

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

Motor Skills:

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

List of Practicals / activities:

1. Form a group of 4 or 5 students and discuss the topic 'Qualities of an effective leader'. Each group will prepare its list with justification to the entire class and write an assignment under the guidance of subject teacher.
2. Form a pair of student and each one from pair will ask each other questionnaire on motivation, self-motivation, experiences that motivated him or other which him for success in the past and write an assignment under the guidance of subject teacher based on discussion.
3. Form a group of 4 or 5 students and assign them a group activity such as 'making a shape from match stick (50 to 100 match sticks) without guidance and without group discussion.
4. The group as in activity 3 will now perform the same activity. After group discussion and under guidance of subject teacher, each student from a group will write an assignment for both the activities and write their inferences with reference to group discussion, team development, team building, etc.
5. Form a group of 8 to 10 student and arrange a group activity such as;
    - Industrial visit.
    - Visit to any historical place/fort/museum, etc
    - Housekeeping and cleaning of any laboratory/seminar hall for any function.

    After the execution of activity student will write an assignment under guidance of teacher keeping in mind individual role, purpose of activity, inter dependency of work or task, coordination of person and task involved and final performance.
6. Write an assignment on interpersonal relationship and conflict management with student's personal experience of solving conflicts.
7. Form a group of 20 students and ask them to prepare a list of 8 to 10 problems affecting the institute. Subject teacher should analyze one such problem on black board using 'Fish bone technique' with the participation of students. Students will write an assignment consisting;
    - Apparent problem statement.
    - Analysis of the causes.
    - Definition of real problem.

8. The subject teacher starts the session with 'Statement of the problem' written on the black board. After ensuring that all the participants are at the same level of understanding the statement of problem, he initiates NGT (Normal Group Technique) to arrive at maximum possible number of creative solutions.
   Based on ranking matrix the group will arrive at feasible solutions and students will write an assignment consisting of;
   - Problem Statement.
   - Model of problem solving.
   - List of creative solution suggested by participants.
   - Write the most feasible solution based on given criteria.

9. Form a group of 4 to 5 students and give them a topic for GD for 10 to 15 minutes. Teacher should analyse GD on certain parameters and students will write an assignment on aspects of GD and prepare a format (suggested or designed by teacher) which gives details of GD carried out.
10. Arrange a guest lecture of H.R. Person from industry/expert in interview technique and conduct mock interview of each student. Student should write a report on this activity.
11. Arrange a visit to industry and gather information about organisation, product, turnover, work culture, vision/mission statement, quality policy, Corporate social responsibility etc and write a report on it.

Note - Subject teacher shall guide the students in completing the assignments based on above practicals.

Learning Resources:
Books:

Sr. No.	Author	Name of Book	Publication
1	Subject Experts-MSBTE	Handbook and assignment book on Development of Life Skills-II	MSBTE
2	Dr. Kumkum Mukherjee	Principles of management and organizational behaviour	Tata McGraw Hill Education Pvt Ltd.
3	Dr.T.Kalyana Chakravarti Dr.T.Latha Chakravarti	Soft Skills for Managers	Biztantra
4	Barun K Mitra	Personality Development and soft skills	Oxford University Press
5	Priyadarshini Patnaik	Group discussion and interview skills	Foundation Books

Course Name : Diploma in Textile Technology

Course Code : TC

Semester : Sixth

Subject Title : Project & Seminar

Subject Code : 17814

Teaching and Examination Scheme

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

General Description

Seminar / Project is the most action oriented teaching methods which demand a great measure of independence from the students - covering actual working situation; covering the interests of all participants; self organization and responsibility and developing practical results. Every student will meet for an hour or so every week in the seminar period for a full term of an academic semester. By project /seminar the students will learn to understand complex and working situations of textile and related industry and to realize and interpret them.

Learning Objectives:

Intention is that the students gain the following skills through the process of seminar / project

1. Skills of Group Interaction.
2. Skills of Integrative Discussion.
3. Skills of critical evaluation.
4. Skills of exploring literature.

Nature or the project:

Project should be based on any one of the following areas and related to any one specific textile processes (spinning, weaving, chemical processing, knitting & garment manufacturing).

1. Manufacturing
2. Innovations
3. Effect of change in parameters on quality and performance.

Expected outcomes of the Project / Seminar:

1. Shy or reserved students get confidence for oral communication.
2. Students experience diverse views on a topic.
3. Discussion helps to clarify students' own views.
4. Students gain a clearer understanding of the topic.
5. Students are highly motivated to research and prepare for discussion / presentations.
6. Group sharing provides a more in depth understanding of the material.
7. Asking questions and forming opinions for seminar leads students to a discovery of who they are.
8. Smaller group discussion allows exploration of topic that might not occur in classroom.
9. Students are put at ease because seminars put each participant on even ground

Planning:

Preparation phase:

Setting dates, selection of topics in consultation with Guide, overall setting of topics, finding related topics, integrating subjects, setting time limits, setting the way of presentation, examining organizational questions.

Main Phase:

Method of individual project phases.

Group work, individual work, working in the class, giving out tasks.

During the main phase, fixed points should be set in regular interval.

Participants should sit together and report their work in the following fashion to date and their plans for the next stage.

Topic:

Material:

Task Completed:

Final Phase: Going through the whole presentation with all participants.