STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA

TEACHING AND EVALUATION SCHEME FOR 6th Semester (Textile Tech./Engg)(wef 2020-21)

Subject Number	Subject Code	Subject	Periods/week			Evaluation Scheme			
			L	T	P	Internal Assessment/ Sessional	End Sem Exams	Exams (Hours)	Total
		Theory							
Th.1		Textile Testing-II	4		-	20	80	3	100
Th.2		Automation and Control system in Textile	4		-	20	80	3	100
Th.3		Garment manufacture Technology	4		-	20	80	3	100
Th.4		Elective Subject- a) Technical Textile b)Textile Mill planning & Management. c) Advance Textile Manufacture.	4			20	80	3	100
		Total	*16*			*80*	*320*	-	*400*
		Practical							
Pr.1		Textile Testing-II lab	-	-	4	25	50	3	75
Pr.2		Garment manufacture Technology Lab	-	-	4	25	25	3	50
Pr.3		Automation and Control system Lab			4	25	25	3	50
Pr.4		Project Work			6	50	100	3	150
Pr5		Life Skill			2	25	-	-	
		Student Centred Activities(SCA)		-	3	-	-	-	-
		Total	-	-	*23*	*150*	*200*	-	*350*
		Grand Total	**16**		**23**	**230**	**570**	**-**	**750**

Abbreviations: L-Lecturer, T-Tutorial, P-Practical . Each class is of minimum 55 minutes duration

Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% and in Aggregate is 40%

SCA shall comprise of Extension Lectures/ Personality Development/ Environmental issues /Quiz /Hobbies/ Field visits/ cultural activities/Library studies/Classes on MOOCS/SWAYAM/Idea Tinkering and Innovation Lab Practice etc. ,Seminar and SCA shall be conducted in a section.

There shall be 1 Internal Assessment done for each of the Theory Subject. Sessional Marks shall be total of the performance of individual different jobs/ experiments in a subject throughout the semester

Th-1. Textile Testing-II

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**TH-1**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Theory Periods:	**4P/Week**	**Internal Assessment:**	**20**
Maximum Marks:	**100**	**End Semester Examination**	**80**

A. Rationale : The main intention for Textile testing is to minimize risk & protect the interests of brands, retailers, suppliers & consumers. The comprehensive testing services enable you to assure quality and safety with precision. In this subject student will know about the basic of yarn & fabric testing and its parameters.

B. Objective : After completion of this subject the students will able to

1. assess quality measures with accepting or rejecting a sample.

2 converge on statistical analysis for its acceptance or rejection of samples.

4. develop concepts and principles in:
   - **a.** Different testing of yarns and fabrics
   - **b.** Quality control of yarns & fabrics

C. Topic wise distribution of periods

Sl. No	Topics	Period
01	Yarn twist	10
02	Yarn strength	15
03	Yarn evenness	15
04	Fabric Properties	15
05	Fabric Strength testing	05
	Total:	**45**

D. Course Contents:

1. Yarn twist

1.1 State the importance of twist in single and ply yarns.
1.2 Explain twist factor and its relation to yarn structure & strength.
1.3 Mathematical relationship between TPI and TM / TF.
1.4 Mathematical calculation of yarn diameter .

2. Yarn strength

2.1 State & Explain the factors affecting yarn strength.
2.2 Describe measurement of single yarn strength and Lea strength.
2.3 Brief idea on principles - CRL, CRE & CRT .
2.4 State & Explain different principles of Textile Testing: Pendulum lever , I.P. tester and Strain gauge.

3. Yarn evenness

3.1 Brief idea on random & periodic variation and discuss Short term, long term and medium term Periodic variation.
3.2 Define limit irregularity ,Index of irregularity, addition of irregularity & effect of doubling on Irregularity.
3.3 Explain methods of assessing yarn irregularity by Visual cutting and weighting , photoelectric and capacitance methods.
3.4 Define Yarn Hairiness.
3.5 Explain ASTM Yarn grading.
3.6 Classimat yarn faults.

4. Fabric Properties

4.1 Explain measurement of Dimensions and Physical Properties of fabrics like Thickness, weight, Shrinkage, crimp.

4.2 Air permeability & water permeability.

4.3 Stiffness and crease recovery, drape, fabric handle, fabric cover.

5. Fabric Strength testing

5.1 Brief idea on tensile strength (Strip & Grab test).

5.2 Brief idea on Tearing Strength, Bursting Strength of cloth.

5.3 Brief idea on abrasion resistance and pilling.

Syllabus to be covered upto IA

Chater 1,2,3

Learning Resources:			
Sl No	**Title of the Book**	**Name of Authors**	**Name of Publisher**
01	Principles of Textile Testing	J.E.Booth	Butter worth & W. london
02	Handbook of Textile Testing & Quality control	Elliot and Hamby	Wiley easfern-New delhi
03	Textile Testing	James Lomax	Long mars-London
04	Statistical method	S P Gupta.	S. Chand & Company Ltd- New Delhi
05	Textile Testing	P.Angappan & R. Gopalakrishnan	SSM ITT staff & students' Co-op. Stores Ltd, Tamilnadu
06	Physical Testing & Quality Control	K. Slater	Textile Institute, Manchester

Th-2. Automation and Control System in Textile

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**TH-2**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Theory Periods:	**4P/Week**	**Internal Assessment:**	**20**
Maximum Marks:	**100**	**End Semester Examination**	**80**

A. Rationale : Interdisciplinary approach on Electronics& control system is highly needed for diploma holder those who will work in modern automated Textile Industries. Further, in modern Textile machineries are made up different sensor / micro processor/ PLC based computer interfaced system . Therefore this course has been kept looking into the modern trend of Textile field..

B. Objective : After completion of this subject the students will able to
1.know about various electronics components, devices, sensors ,transducers and electronics controllers and data processing system.
2. measure physical parameters in terms of electrical and electronics form ,so that it can process online by digital computer.
3.know about advanced automatic control system using advance controller by PLC, microcontroller and micro processor..

Sl. No	Topics	Topic wise distribution of periods
01	Active & Passive components	06
02	Classification of materials& semi conductor Devices	10
03	Sensors , Actuators& measurement of physical quantity	10
04	Control system & PLC	14
TOTAL		60

D. Course Contents:

1. Active & Passive components
1.1 Resistors - principle, specifications, types, color coding , property, specifications, rating.
1.2 Inductor - principle, specifications, types, property, specifications, rating.
1.3 Capacitors - principle, specifications, types, color coding , property, specifications, rating.

2. Classification of materials& semi conductor Devices
2.1 Classification of material- conductors, semiconductors, insulators Semiconductor types- intrinsic, extrinsic- P & N type PN junction diode- unbiased, forward & reverse bias, VI characteristics of diode, application- half wave ,full wave & bridge rectifiers.
2.2 Transistor- construction, types- PNP & NPN, working Operating regions- active, cut off, saturation; application- amplifier, transistor as a switch.
2.3 Introduction to Op-amp, block diagram, 741 pin out diagram, Applications- inverting, non-inverting amplifier using Op-amp. Introduction to instrumentation amplifier using Op-amp.

3. Sensors , Actuators& measurement of physical quantity
3.1 Optical sensors- LDR, photodiode, phototransistor, LED, optocoupler
3.2 Displacement sensor- LVDT, capacitive sensor- level measurement
3.3 Force & weight measurement- strain gauge,
3.4 Temperature sensors- RTD, thermister, thermocouple, humidity sensors
3.5 Pressure sensor- bourdon tubes, bellows
3.6 Actuators- relays, contactors, solenoids, electric & pneumatic Signal conditioning- principle, need of bridges, data converters

4. Control system & PLC
4.1 Control systems : Introduction, Classification of different types of control system - open loop & closed loop control system.
4.2 Digital Electronics, Logic gates

4.3 Difference between analog and digital electronics Binary number system, digital gates, flip flops- RS, D & JK flip flop ,Counter – synchronous, asynchronous up and down counter Memory - ROM & RAM (basic concept only)

4.4 Introduction to Microcontroller, block diagram, features & Architecture of 8051 [programming, instruction set not included]

4.5 Programmable Logic Controller- introduction, block diagram ,Explain basic structure and operation of PLC, Describe simple ladder logic, Write simple ladder programme (implementing only OR, AND, NOR , NAND, Ex-OR, Ex-NOR logic , Timer Operation..

4.6 Automatic Textile control system - multiloop control system .

Syllabus to be covered upto IA

Chater 1,2

Learning Resources:			
Sl No	**Title of the Book**	**Name of Authors**	**Name of Publisher**
01	A Text Book of Applied Electronics	R. S. Sedha	S. Chand & Company
02	Semiconductor Devices and Circuits	V K Meheta	S. Chand & Company
03	Electrical & Electronics measurements & instrumentation	S.K.Singh	
04	Electronic controls in textile machines	Hiren Joshi, Gauri Joshi	NCUTE training program
05	Feed Back Control System	Benzamin Kue	
06	Solid state electronic devices	D K Bhattacharya	
07	Principle of semiconductor devices	SimaDimitrejev	

Th-3. Garment Manufacturing Technology

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**TH-3**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Theory Periods:	**4P/Week**	**Internal Assessment:**	**20**
Maximum Marks:	**100**	**End Semester Examination**	**80**

A. Rationale : In the twenty-first century, clothes become a fashion product rather than a basic need. Our consumption of clothing has increased compared to the last decades of the 20th Century. The demand for clothing products are growing rapidly. Apparel companies are scaling up quickly to supply the clothing needs of the domestic and global markets. So, in this subject students will learn the basic process of garment manufacturing techniques.

Objective : After completion of this subject the students will able to
1.acquire deep knowledge on processes involved in Garment manufacturing.

2.develop an idea about classification, preparation procedure, costing, as well as merchandising of garments.

3. develop concept ,principle, production and quality aspects of garments.

C. Topic wise distribution of periods		
Sl. No	**Topics**	**Period**
01	Garments & Measurements	04
02	Patterning & Grading	10
03	Spreading, Cutting & Sorting	12
04	Sewing Technology	12
05	Fusing, Pressing & Packing	10
06	Marketing & Merchandising	12
	Total:	**60**

D. Course Contents:

1. Garments & Measurements

1.1 Classify Garments for Men and Women.
1.2 State different Fabric selection for Garments and Properties
1.3 Eight Head Theory of Human Anatomy.
1.4 Explain Measurements and its importance.
1.5 Describe method of Taking important body measurements for gents and ladies garment.

2. Patterning & Grading

2.1 State Patterning Importance of paper patterns.
2.2 Explain Types & methods of paper patterns.
2.3 Explain Principles of pattern drafting,
2.4 Study of pattern making of Top and Bottom Garments
2.5 State Grading – Study of Grading of various components of Top and Bottom Garments, Marker Planning.
2.6 Explain Computer Aided Pattern Making and Grading System.

3. Spreading, Cutting & Sorting

3.1 Define Spreading.
3.2 Explain the purposes and methods of Spreading
3.3 Describe Cutting – Hand Shear and different types of cutting machines such as straight knife, Bend knife, circular knife, computer controller cutting knife, etc. and assorting, stickering, bunding.

4. Sewing Technology

4.1 Define & classify stitch, seam

4.2 Classify different types of seams sewing aids / tools,

4.3 Describe parts of sewing machine.

4.4 Elaborate Various types of sewing machines such as Lock stitch, chain stitch, over lock, flat lock, button holing, buttoning and computer controlled sewing machines, State timing diagram for lock stitch.

4.5 Explain Trimmings, Selection of Needle and sewing thread.

4.6 Explain Construction of Top and Bottom and Garments, Individual and Group production systems.

5. Fusing, Pressing & Packing

5.1 Explain Fusing, Base cloth, Resins coating systems, Temperature, time, pressure. Peel strength,

5.2 Pressing, types of pressing, basic components of under pressing,

5.3 Describe Machinery and Equipment Pressing, Top Pressing Controls, Handling Systems.

5.4 Elaborate Packing, Different types of packing, Packing materials, labels and tags.

6. Marketing & Merchandising

6.1 Define Marketing, sales, Merchandising, customers / buyers, product / costing, Lead time.

6.2 Explain Time Planning and Scheduling, raw materials and accessories sources.

6.3 State structure of Garment manufacturing unit, contractors & subcontractors,

6.4 Elaborate packaging.

6.5 Distribution / delivery, market research promotion, State Garment organization & export.

Syllabus to be covered upto IA

Chater 1,2,3

Learning Resources:			
Sl No	**Title of the Book**	**Name of Authors**	**Name of Publisher**
01	*The Technology of Clothing Manufacture*	Carr H and Lantham B	Om Book Service, Delhi
02	*Managing Quality in apparel industry*	Mehta P V and Bhardwaj S K	Om Book Service, New Delhi
03	*Metric Pattern Cutting*	Aldrich W	OM Book Service, New Delhi (1998)
04	*Garment Technology for Fashion Designers*	Cooklin Gerry	OM Book Service, New Delhi (1997).
05	*Clothing Construction*", 2nd Ed	Eveleyn M and Ucas	Hughton Mifflin Co, Boston (1974)

Th-4a. Technical Textiles

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**TH-4a**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Theory Periods:	**4P/Week**	**Internal Assessment:**	**20**
Maximum Marks:	**100**	**End Semester Examination**	**80**

A. Rationale : A Technical Textile is a textile product manufactured for non-aesthetic purposes, where function is the primary criterion. Technical textiles include textiles for automotive applications, medical textiles (e.g., implants), geotextiles (reinforcement of embankments), agrotextiles (textiles for crop protection), and protective clothing (e.g., heat and radiation protection for fire fighter clothing, molten metal protection for welders, stab protection and bulletproof vests, and spacesuits). The sector is large, growing, and supports a vast array of other industries. The global growth rate of technical textiles is about 4% per year, which is greater than the growth rate of home and apparel textiles, which are growing at a rate of 1% per year. In this subject student will know about the basic of fibres, yarns & fabrics used for Technical textile field .

B. Objective : After completion of this subject the students will able to

1. acquaint with Industrial, space, medical, geological as well as military textiles.

2. develop concepts and principle in: different aspects and applications of house hold textiles, furnishing textiles, industrial textiles etc.

C. Topic wise distribution of periods		
Sl. No	**Topics**	**Period**
01	Introduction to Technical Textile	20
02	Filtration & Geo-Textile	10
03	Protective & Medical Textile	15
04	Sports, Automotive & Agro Textile	15
	Total:	**60**

D. Course Contents:

1. Introduction to Technical Textile

1.1 Definition and scope for technical textiles, present status and future of technical textile.
1.2 Brief idea about technical fibres like- Carbon fibres, Aramid and related fibres, Glass etc.

2. Filtration & Geo-Textile

2.1 Definition of filtration parameters, wet & dry filtration, filtration requirements, concept of pore size and particle size, role of fibre, fabric construction.
2.2 Brief idea about geo-synthetics and their uses, essential properties of geotextiles, application.

3. Protective & Medical Textile

3.1 Classification of medical textiles. Surgical Textiles and Sutures, Hollow fibres.
3.2 Hospital Textiles- operating and post operating clothing, disposable drapes.
3.3 Textiles for sanitary applications..
3.4 Brief idea about different type of protective clothing.
3.5 Functional requirement of textiles in defence including ballistic protection materials and parachute cloth, temperature and flame retardant clothing.
3.6 chemical protective clothing & water proof breathable fabrics.

4. Sports, Automotive & Agro Textile

4.1 Functional requirement of different types of product and their construction for sports textiles.

4.2 Brief idea about the important properties and requirements in automotive textiles, textiles components in tyre, tyre structure and design.

4.3 Textiles in agriculture, electronics, power transmission belting, hoses, canvas covers and tarpaulins.

Syllabus to be covered upto IA

Chater 1,2

Learning Resources:			
Sl No	**Title of the Book**	**Name of Authors**	**Name of Publisher**
01	*Handbook of Technical Textiles*	A R Horrocks and S C Anand	Woodhead Publication Ltd., Cambridge (2000)
02	*Engineering with Geosynthetics*	G V Rao and G V S Raju	Tata McGraw Hill Publishing Co. Ltd., New Delhi (1990)
03	*Industrial Textile*	J Svedova	Elsevier, New York (1990).
04	*Automotive Textiles*	Mukhopadhyay S K and Partridge J F	Vol. 29, No. ½, The Textile Institute (1999).
05	Industrial Application of Textiles for Filteration and Coated fabrics	Pushpa, B., and Sengupta, A.K	Textile Progress Vol.14, 1992

Th-4b. Textile Mill Planning & Management

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**TH-4b**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Theory Periods:	**4P/Week**	**Internal Assessment:**	**20**
Maximum Marks:	**100**	**End Semester Examination**	**80**

A. Rationale : This course will provide the knowledge which deals with various important issues facing to manage the Textile Industry. The content related with Man, Machine, Material, and Money will help Textile students to manage the resources effectively. The planning of machine specification and its implementation will help students to arrange plant layout in detail. The managerial aspects like Man power requirement, Productivity management content will help to take effective decision. The objective of this course is to take effective decision and manage the textile industry effectively by textile students.

B.Objective : After completion of this subject the students will able to

1. understand ,principle and application management in brief..
2. know the basic elements management man, machine, method, material & money.
3 accommodate themselves in the Industrial environment with managerial capability in Textile Industries.
5. develop concepts and principles in
   (a) Different managerial aspects of a textile mill.
   (b) Organization of a textile mill.
   (c) Costing and cost calculation of the products.

Sl. No	Topics	Topic wise distribution of periods
01	Principles of Management and Organization Behaviour	10
02	Human needs, Relation , Behavioural Dynamic and Supervisors Role in H.R.D	15
03	Productivity, Costing and Quality Norms	20
04	Humidification in Textile Mill	10
05	Material Handling	05
	TOTAL	60

1. Principles of Management and Organization Behaviour
1.1 Define principle of Management
1.2 State the Organizational Structure in Textile Mill, Spinning mill for Ring spun carded and Combed Yarn, open end Yarn, Power Unit, process house.

2. Human needs, Relation , Behavioural Dynamic and Supervisors Role in H.R.D
2.1 Explain Need and importance of H.R. Maslow's Hierarchy Theory, Describe Human Values, Inter personal behaviour, leadership, attitude.
2.2 State the needs , importance and types of training, Motivation, counseling , Daily master report.

3. Productivity, Costing and Quality Norms
3.1 Define and classify productivity
3.2 State its importance in context of quality, cost.
3.3 Explain factors affecting productivity
3.4 How to improve productivity in a Textile Mill.
3.5 Describe production of planning, product mix, loom programme, yarn requirement, spin plan.
3.6 Calculate yarn cost/K.g of yarn, fabric cost/K.g
3.7 State quality standards for different yarn & fabric, Calculate productivity, yarn realization, state the means of Waste minimization.

4.Humidification in Textile Mill

4.1 State the purpose of humidification in Textile mills

4.2 Explain different Types of Humidification plant and their working .

5. Material Handling

Discuss different methods used to handle the material in a textile mill.

Syllabus to be covered upto IA

Chater 1,2

Learning Resources:			
Sl No	**Title of the Book**	**Name of Authors**	**Name of Publisher**
01	*Management of Textile Industry*	Dudeja V D	Textile Trade Press, Ahmedabad
02	*Textile Project Management*	Ormerod A	The Textile Institute, Manchester UK
03	*Weaving – Machine,Mechanism and Management*	Talukdar M K, Srirammulu P K and Ajgaokar D B	Mahajan Publisher Private Ltd., Ahmedabad, India (1998)
04	*Process Control in Spinning*	Garde A R and Subramanian T A	3rd Ed., ATIRA Ahmedabad, (1987).
05	*Handbook of Maintenance Management*	Higgins	Prentice Hall New York
06	Organisational Behaviour	Keith Davis	McGraw-Hill
07	Organisational Behaviour	K.Aswathappa	Himalaya Publishing House

Th-4c. Advance Textile Manufacture

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**TH-4c**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Theory Periods:	**4P/Week**	**Internal Assessment:**	**20**
Maximum Marks:	**100**	**End Semester Examination**	**80**

A. Rationale : The conventional machines & equipments have limitations with respect to quality and production capacity. In the present era of globalization in our country, the age of competition is being witnessed. Now, it is becoming imperative to use advanced machines &equipments. These machines should be capable of giving very high production and high quality products in weaving. In India, the trend is towards scrapping the old machinery and introducing state of art technology to have competitive edge in the international market. Many textile mills have already incorporated the advanced machines and equipments. These equipments being highly capital intensive, it should be used to its highest potential, for this the students should be equipped with the knowledge and information about the construction, working, process control and maintenance of these advanced machines. Simultaneously the advanced machines adopt automation of functions and lot of electronic monitoring system to achieve the targets with respect to quality and production. This course imparts knowledge and skills to the diploma students in modern shuttle less looms.

B.Objective : After completion of this subject the students will able to

1. explore the mechanism used globally to produce state-of-art fabrics.

2. aquaint with modern fabic production mechanism and techniques

3..develop concepts and principle in: different aspects of non-conventional looms like projectile loom, rapier loom, air jet loom and water jet loom.

Sl. No	Topics	Topic wise distribution of periods
01	Introduction to Shuttle- less loom	10
02	Projectile Loom	10
03	Rapier Loom	15
04	Air-jet Loom	15
05	Water-jet Loom	10
TOTAL		60

1. Introduction to Shuttle- less loom

1.1 Differences between Shuttle & Shuttle-less loom
1.2 Importance of Shuttle less loom in Textile Industries
1.3 Describe different aspects of Rapier Looms, Gripper loom, Air-jet, Water-jet looms & Multiphase.

2. Projectile Loom

2.1 Discuss Weft package
2.2 Weft insertion mechanism
2.3 Match-Cam beating
2.4 Selvedge formation in projectile loom
2.5 Modern development of this loom.

3. Rapier Loom

3.1 Classification of rapier
3.2 Weft insertion mechanism of rigid, flexible, single & double rapier loom
3.3 Selvedge formation
3.4 Modern development of this loom.

4. Air- Jet Loom

4.1 Describe Weft measuring devices
4.2 Confusers, Profile reed, Weft insertion in air-jet loom
4.3 Modern development of this loom.

5. Water- Jet Loom

5.1 Describe Weft measuring devices
5.2 Confusers, Profile reed, Weft insertion in air-jet loom
5.3 Modern development of this loom.

Syllabus to be covered upto IA

Chater 1,2

Learning Resources:			
Sl No	**Title of the Book**	**Name of Authors**	**Name of Publisher**
01	Principle of Weaving	R. Marks and Robbinson	Textile Institute, manchester
02	Cotton Weaving	V. Goordev	MIR Publication- Moscow
03	*Weaving – Machine,Mechanism and Management*	Talukdar M K, Srirammulu P K and Ajgaokar D B	Mahajan Publisher Private Ltd., Ahmedabad, India (1998)
04	Weaving Mechanism	N.N. Banerjee	T. Banerjee, Berhampore, W.B
05	Weaving Calculation	Sengupta	D.B. Taraporerala Sons & Co-Bombay
06	Weaving: Conversion from yarn to Fabric	P. R. Lord & Mohamad	Woodhead Publication Ltd-Cambridge England
07	Weaving Tablets	TAI	TAI

Pr-1. Textile Testing-II (Lab.)

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**Pr-1**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Lab. Periods:	**4P/Week**	**Sessional:**	**25**
Maximum Marks:	**75**	**End Semester Examination**	**50**

A. Rationale : This subject intends to equip students with the concepts, principles and methods of testing of various textile fiber and yarns, and fabric which is helpful in selection of raw materials, process control, process optimization, quality assurance and research purpose. Since textile is system of mass production and contains lots of variations, lot of experimentation is required. Results obtained from specific number of observations are to be analyzed, interpreted and used for best outcomes. Therefore, students are equipped with the methods to analyze the testing results statistically.

Objective : After completion of this subject the students will able to
1. deal with the concept of Textile Testing & it related equipments.
2. directly work with Textile Testing equipments to find out different yarn and fabric parameters.

Experiment No	Topics	Topic wise distribution of periods in hours
01	Determination of single yarn and double yarn TPI by using single / double yarn twist tester	5
02	Determination of single yarn and double yarn twist tester by Electronic twist tester	5
03	Determination of CSP value of the given yarn by using Warp Reel, Knowl's Balance and Lea Strength Tester.	10
04	Determination of CSP value of the given yarn by using Lea Multi Tester	10
05	Determination of yarn tenacity by using single yarn strength tester .	5
06	Determination of U – Percentage, thick, thin and neps present in the given yarn by using star evenness tester and to find no. of hairs present in the yarn by star hairiness tester.	5
07	Determination of Tensile Strength of Fabric (Both reveled and un-revelled) by vertical fabric strength tester.	10
08	Determination of Tearing Strength of the given fabric by using Fabric Tearing Strength Tester	10
09	Determination of Fabric Bending Length Flexural Rigidity by using Fabric Stiffness Tester and to find crease recovery angle of the same Fabric by crease recovery tester.	10
10	Determination of following particulars of the given fabric: (1) Ends/inch (2) Pick/inch (3) Warp Count (4) Weft count (5) Warp and Weft contraction % (6) Grams/Sq. mt. (7) Size pick up (8) Fabric cover.	10
11	Determination of Bursting Strength and abrasion Resistant of Fabric by bursting strength tester and abrasion resistant ester.	10
TOTAL		90

Pr-2. Garment Manufacturing Technology (Lab.)

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**Pr-2**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Lab. Periods:	**4P/Week**	**Sessional:**	**25**
Maximum Marks:	**50**	**End Semester Examination**	**25**

A. Rationale : Clothing since ages is one of the basic necessities of methods. To make oneself and surrounding more attractive human being saw a great potential in textile fabrics, the creating demand of fashion fabric. Garment industry is one of the major industry for the Indian government, which brings in foreign exchange to the tune more than 20,000 crore Rupees per annum. Student will learn different sequential procedures for making garment in details like standard body measurements, pattern making, pattern drafting, stitching the fabric to form garment.

B. Objective : After completion of this subject the students will able to

1. deal with the concept of garment manufacturing & it's related machinery.

2. directly work with different sewing M/c and other garment manufacturing related M/C as well as equipments.

Experiment No	Topics	Topic wise distribution of periods in hours
01	Flat pattern techniques – developing paper patterns : Basic blocks of upper & lower garments	40
02	Adaptation of the body blocks into stylized garments – patterns with different kinds of sleeves, collars etc	30
03	Pattern grading	20
TOTAL		90

Pr-3. Automation and Control system (Lab.)

Name of the Course: Diploma in Textile Technology /Engineering			
Course Code:	**Pr-3**	**Semester:**	**6th**
Total Period:	**60**	**Examination:**	**3hours**
Lab. Periods:	**4P/Week**	**Sessional:**	**25**
Maximum Marks:	**50**	**End Semester Examination**	**25**

A. Rationale : The state of art of Textile machines require a precision control over their speed, change in speed temperature, to & fro motions levels. So most of the textile machineries equipped with electronic sensors & limit switches. A little malfunctioning of these electronic sensors may lead to deliver a futile situation and result in worthless products. Hence it has become essential to acquire basic knowledge about all these electronic control system. This paper will enlighten the students of diploma about the principles, working & uses of electronic sensors & devices.

Objective : After completion of this students will able to able to develop practical understanding and uses of

1. Special semiconductor devices
2. Opto-electronic devices & different sensors.
3. Regulated power supply
4. Principles of digital electronics
5. Sensors and transducers
6. Microcontoller
7. PLC
8. Automatic Control

Experiment No	Topics	Topic wise distribution of periods in hours
01	Study of different types of thermometer, RTD & Thermocouples	4
02	Study of different types of pressure Gauge, (Boudern tube)	2
03	Study about DC regulated power supply	4
04	Implementation of AND , OR , NAND , NOR , XOR, NOT gates and verification of truth table.	4
05	Verification of R- S flip – flop and J-K flip – flops	4
06	Verification of performance of Mod-10 Counter & up- and –down counter	4
07	Study about PLC trainer	4
08	Write down simple ladder programme implementing OR, AND, NOR, NAND, EX-OR, EX-NOR logic gates	6
09	Study about time operation of a Electrical device using PLC for Textile Machinery.	6
10	Study about Electronic On-Off Temperature controller using different sensor in Textile machineries.	4
11	Study about automatic liquid level controller using microcontroller in Textile processing field	6
12	Study about automatic Pressure controller using microcontroller in Textile field	6
13	Study about automatic Temperature controller using microcontroller in Textile field	6
TOTAL		60

Pr4. PROJECT Phase - II

Name of the Course: Diploma in Textile Tech/ Engineering			
Course code:		Semester	6th
Total Period:	90	Examination	3 hrs
Lab. periods:	6 P / week	Sessional	50
Maximum marks:	150	End Sem Examination	100

RATIONALE

Students' Project Work aims at developing innovative skills in the students whereby they apply the knowledge and skills gained through the course covered in many subjects and Labs, by undertaking a project. The prime emphasis of the project work is to understand and apply the basic knowledge of the principles of Textile engineering and practices in real life situations, so as to participate and manage a large Textile engineering projects, in future. Entire Project spreads over 5th and 6th Semester. Part of the Project covered in 5th Semester was named as *Project Phase-I* and balance portion to be covered in 6th Semester shall be named as *Project Phase-II*.

OBJECTIVES

After undergoing the Project Work, the student will be able to:

- Implement the theoretical and practical knowledge and skills gained through various subjects/courses into an application suitable for a real practical working environment, preferably in an industrial environment.
- Develop software packages or applications and implement these for the actual needs of the community/industry.
- Identify and contrast gap between the technological knowledge acquired through curriculum and the actual industrial need and to compensate it by acquiring additional knowledge as required.
- Carry out cooperative learning through synchronous guided discussions within the class in key areas, asynchronous document sharing and discussions, as well as prepare collaborative edition of the final project report.
- To achieve real life experience in Project design.
- To develop the skill of writing Project Report

Project Phase-I and Phase-II

The Project work duration covers 2 semesters(5th and 6th sem). The Grouping of students, selection of Project, assignment of Project Guide to the Group was done in the beginning of 5th semester under Project Phase-I. The students were allowed to study literature, any existing system and then define the Problem/objective of the Project. Preliminary work and Design of the system also have to be complete in Phase-I. Development may also begin in this phase. Project Milestones are to be set so that progress can be tracked .

In Phase-II Development, Testing, Documentation and Implementation have to be complete. Project Report have to be prepared and complete in Phase-II. All Project reports should be organized uniformly in proper order, irrespective of group. Teacher Guides can make suitable alteration in the components of Task and schedule.

At the end of Project Phase-II in 6th semester there shall be one presentation by each group on whole Project work undertaken by them.

A suggestive criterion for assessing student performance by the external (preferably person from industry) and internal (teacher) examiner is given in table below:

Sl. No.	Performance Criteria
1.	Selection of project assignment
2.	Planning and execution of considerations
3.	Quality of performance
4.	Providing solution of the problems or production of final product
5.	Sense of responsibility
6.	Self expression/ communication/ Presentation skills
7.	Interpersonal skills/human relations
8.	Report writing skills
9	Viva voce

The teachers are free to evolve other criteria of assessment, depending upon the type of project work.
It is proposed that the institute may organize an annual exhibition of the project work done by the students and invite leading Industrial organisations to such an exhibition.

The Project Report need to be prepared as per standard format and following is the indicative format. The Teacher Guide may make minor alteration keeping the sense in tact.

Organization of Project Report

1. Cover page:
   It should contain the following (in order)
   (i) Title of the Project
   (ii) "Submitted in partial fulfillment of the requirements for the Diploma in <Branch Name>"
   (iii) By Name of the Student(s)
   (iv) Logo of the Institution
   (v) Branch Name/Depart Name and Institution Name with Address
   (vi) Academic Year
2. 1st Inner page
   Certificate:
   It should contain he following
   "This is to certify that the work in this Project Report entitled <Project Title> by <Name of student(s)> has been carried out under my supervision in partial fulfillment of the requirements for the Diploma in <Branch Name>" during session <session > in <Branch /Department Name> of <Institute name> and this work is the original work of the above student(s).

   Seal and signature of the Supervisor/Guide with date
3. 2nd Inner Page
   Acknowledgement by the Student(s)
4. Contents.
5. Chapter wise arrangement of Reports
6. Last Chapter: Conclusion
   It should contain
   (i) Conclusion
   (ii) Limitations
   (iii) Scope for further Improvement
7. References

Pr-5 LIFE SKILL

(Common to All Branches)

Practical	**2 Periods per week**	**Sessional**	**25 Marks**
Total Periods	**30 Periods**	**Total Marks**	**25 Marks**

Objective: After completion of this course the student will be able to**:**

- Develop team spirit i.e. concept of working in team
- Apply problem solving skills for a given situation
- Use effective presentation techniques
- Apply task management techniques for given projects
- Enhance leadership traits
- Resolve conflict by appropriate method
- Survive self in today's competitive world
- Face interview without fear

DETAIL CONTENTS:

1. SOCIAL SKILL

Society, Social Structure, Develop Sympathy and Empathy
Swot Analysis – Concept, How to make use of SWOT
Inter personal Relation**:** Sources of conflict, Resolution of conflict ,
Ways to enhance interpersonal relation

2. PROBLEM SOLVING

Steps of Problem solving**:**

- Identify and clarify the problem,
- Information gathering related to problem,
- Evaluate the evidence,
- Consider alternative solutions and their implications,
- Choose and implement the best alternative,
- Review
- Problem solving techniques:

1) Trial and error, 2) Brain storming, 3) Lateral (Out of Box) thinking

3. PRESENTATION SKILL

Body language , Dress like the audience
Posture, Gestures, Eye contact and facial expression. STAGE FRIGHT,
Voice and language – Volume, Pitch, Inflection, Speed, Pause
Pronunciation, Articulation, Language, Practice of speech.
Use of AV aids such as Laptop with LCD projector, white board etc.

4. GROUP DISCUSSION AND INTERVIEW TECHNIQUES

Group Discussion:
Introduction to group discussion, Ways to carry out group discussion,
Parameters— Contact, body language, analytical and logical thinking,
decision making
Interview Technique :
Dress, Posture, Gestures, facial expression, Approach
Tips for handling common questions.

5. WORKING IN TEAM

Understand and work within the dynamics of a groups.
Tips to work effectively in teams,
Establish good rapport, interest with others and work effectively with them
to meet common objectives,
Tips to provide and accept feedback in a constructive and considerate way ,
Leadership in teams, Handling frustrations in group.

6. TASK MANAGEMENT

Introduction, Task identification, Task planning ,
organizing and execution, Closing the task

PRACTICAL

List of Assignment: *(Any Five to be performed including Mock Interview)*

a. SWOT analysis:-

Analyse yourself with respect to your strength and weaknesses, opportunities and threats. Following points will be useful for doing SWOT.

a) Your past experiences,
b) Achievements,
c) Failures,
d) Feedback from others etc.

b. Solve the True life problem assigned by the Teacher.

3. Working in a Team

Form a group of 5-10 students and do a work for social cause e.g. tree plantation, blood donation, environment protection, camps on awareness like importance of cleanliness in slum area, social activities like giving cloths to poor etc.(One activity per group where Team work shall be exhibited)

4. Mock Interview

5. Discuss a topic in a group and prepare minutes of discussion.

6. Deliver a seminar for 5 minutes using presentation aids on the topic given by your teacher.

7. Task Management

Decide any task to be completed in a stipulated time with the help of teacher. Write a report considering various steps in task management (with Break up into sub tasks and their interdependencies and Time)

Note: -1. Please note that these are the suggested assignments on given contents/topic. These assignments are the guide lines to the subject teachers. However the subject teachers are free to design any assignment relevant to the topic.

Note: -2. The following Topics may be considered for Seminar/GD in addition to other Topics at the discretion of the Teacher.

(Comparison with developed countries, Occupational Safety, Health Hazard, Accident & Safety, First-Aid, Traffic Rules, Global Warming, Pollution, Environment, Labour Welfare Legislation, Labour Welfare Acts, Child Labour Issues, Gender Sensitisation ,Harassment of Women at Workplace)

METHODOLOGY:

The Teacher is to explain the concepts prescribed in the contents of the syllabus and then assign different Exercises under Practical to the students to perform.

Books Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the Publisher
01	E.H. Mc Grath , S.J	Basic Managerial Skills for All	PHI
02	Lowe and Phil	Creativity and problem solving	Kogan Page (I) P Ltd
03	Adair, J	Decision making & Problem Solving	Orient Longman
04	Bishop , Sue	Develop Your Assertiveness	Kogan Page India
05	Allen Pease	Body Language	Sudha Publications Pvt. Ltd.

LIST OF MAJOR EQUIPMENT / MACHINERY FOR PRACTICAL CLASSES

Sl No	Name of Machineries /Equipments	Required No
01	Single Yarn Twist Tester	01no
02	Double Yarn Twist Tester	01no
03	Electronics Twist tester	01no
04	Beesley Balance	01no
05	Lea strength tester	01nos
06	Single yarn strength tester	01nos
07	Evenness test	01 no
08	Fabric strength Tester	01no
09	Fabric stiffness tester	01no
10	Crease recovery tester	01 no
11	Bursting tester	01no
12	Fabric Tearing Strength Tester	01no
13	Pattern making tools	Lump sum
14	Cutting M/c	01no
15	Motorised sewing M/C	01no