

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Process Control in Spinning and Weaving
Subject Code : 136TM61

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Term work		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
4	-	3	3	80	32	20	100	40	50	20	-	-	25	10	175

Rationale:

It covers process control in various stages of spinning and weaving department. Process control in spinning covers blowroom, carding, drawframe, comber, comber preparatory, flyframe and ringframe department. Process control in weaving covers process control in winding, warping, sizing, pirn winding and loomshed department.

Objectives:

Familiarize the students to the various process control practices in the mills.
 Familiarize the students to the various process control practices in the mills.

Syllabus

Part I:- Theory

Sr No	Topic	Contents	L	M
Section I				
1	Introduction to process control	Role and scope of process control. Establishing norms and standards. Collection and interpretation of data for process control.	10	12
2	Process control for spinning preparatory and spinning	Control of waste and cleaning in Blowroom and card. Control of comber waste. Process control in roving frames. Implementation of process control in cotton spinning. Control of yarn realization. Defects in ring spun yarns and package defects, their causes and remedies.	11	14
3	Productivity and machinery Audit	Causes of end-breaks and their control in ring spinning. Control of yarn count, strength, unevenness and imperfections. Measurement, analysis and means to improve productivity. Machinery audit and the test instruments for machinery audit.	11	14
Section II				
5	Process Control- Introduction	5.1 Introduction to process control and its approach 5.2 Scope of process control and its approach. 5.3 Loom productivity 5.4 Methodology of direct control, Setting Norms and Schedule of Checks 5.5 Machinery Audit.	03	04
6	Productivity in	6.1 Introduction	05	05

	winding	6.2 Control in winding 6.3 Scope and approach 6.4 Optimizing quality of preparation 6.5 Control of Productivity 6.6 Package defects in winding 6.7 Control of Hard waste 6.8 Calculations		
7	Process Control in warping	7.1 Scope and approach 7.2 Minimising End Breaks in Warping 7.3 Performance of Warping 7.4 Quality of Warping Beams 7.5 Control of Productivity 7.6 Package defects in warping 7.7 Control of Hard waste 7.8 Calculations	04	05
8	Process control in sizing	8.1 Introduction 8.2 Scope and approach to process control 8.3 Choice of size recipe and size pick up. 8.4 Control of Size pick up, Control of yarn stretch, Control of Moisture in Sized yarns 8.5 Quality of Sized Beams 8.6 Devices for Improving weavability of Sized yarn 8.7 Control of Productivity and Control of Size Losses 8.8 Package defects in sizing 8.9 Control of Hard waste 8.10 Calculations	07	09
9	Process control in pirn winding	9.1 Process Control in Pirn Winding: Introduction 9.2 Scope and approach, 9.3 Minimising End Breaks 9.4 Productivity 9.5 Package defects in pirn winding 9.6 Control of Hard waste	03	04
10	Drawing in	10.1 Drawing–in and Warp tying: 10.2 Scope and approach 10.3 precautions to be taken during drawing and tying 10.4 Productivity. 10.5 Control of Hard waste	02	04
11	Productivity in loom shed	11.1 Control of Productivity in Loomshed: 11.2 Scope and approach 11.3 Control of Loom speed, Control of Loom efficiency, Control of Loom Stops 11.4 Control of Loss of Efficiency by snap reading, 11.5 Expected loom efficiency on automatic and non automatic loom 11.6 Fabric defects and its remedies 11.7 Control of Hard waste	08	09
		Total	64	80

Part II: - Practicals

List of Workshop Experiments:

1. Spinning of cotton/blended yarn.

2. Testing of cotton/blended yarn.
3. Manufacturing of fabric on the loom.
4. Loom running practice – Starting & stopping of loom – one pick Two pick – attending warp and weft breaks.

Learning Resources:-

Text Books:

1. Process Control in spinning by A. R. Garde and T A Subramanian, Published by ATIRA , First Edition 1974
2. Process control in weaving, ATIRA, Paliwal and Khimothi, Published by ATIRA, 1974.

References:

1. Weaving- Mechanism and Management- Talukdar, Sriramulu and Ajgaonkar
2. Principles Weaving Mechanisms – Marks and Robinson , The Textile Institute, Manchester, 1976

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Textile Mill Planning, organization and costing
Subject Code : 136TM62

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		Practical		Oral		Term work		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
4	-	-	3	80	32	20	100	40	-	-	-	-	-	-	100

Rationale:

The subject covers the calculations regarding production and machinery allocation in spinning and weaving and knitting. These calculations are important in day today working plan for a textile mill. This subject also covers selection of site for new industry, Material handling, Building and construction requirement for Textile Mill, It also covers the categories of labour required in textile mills. Costing covers basic conceptual understanding of subject and its application in various methods. In this subject the topic project management will help to develop skill in the students to prepare project.

Syllabus

No	Topic	Contents	Lecture Hours	Marks
Section I				
1	Machinery Specification, Selection & Calculation for No. of Machines	2.1 Selection of machines & machinery specifications required for the product in spinning, weaving, knitting. 2.2 Calculation for no. of machines in spinning /spin plan. 2.2.1 Preparation of organization for ring spinning mill and preparatory departments based on ring spindle capacity and production of ring spun yarn (Carded, Combed, Blended, Folded). 2.2.2 Preparing organization of rotor spinning mill. 2.3 Calculation regarding efficiency, waste, draft, twist, production rates, amount of raw material required and no. of machinery required at different stages of spinning process. 2.4 Calculation for no. of machines in weaving / weave plan - Preparation of organization for shuttle & shuttleless weaving mill and preparatory departments based on number of weaving machines & production of different cloths. 2.4.1 Calculation regarding efficiency, waste, crimp, production rates, raw material and no. of machinery required at different weaving processes.	14	18
2	Plant & Machinery Layout -	3.1 Introduction 3.2 Objectives of good plant layout 3.2 Principles of layouts, 3.3 Types of layouts and their advantages and disadvantages	10	10

		3.4 Flow pattern, work station design, tools and devices of making layouts 3.6 Storage space requirements 3.7 Plant layout procedure 3.8 Factors influencing layouts 3.9 Selection of layout 3.10 Effect of automation on plant layout 3.11 Symptoms of bad layout. 3.12 Layout aspects of spinning, weaving, knitting and composite mills.		
3	Site Selection	4.1 Introduction 4.2 Selection of site for textile mills 4.2.1 General location 4.2.2 Actual selection of specific site 4.3 Factors influencing site selection 4.3.1 Climatic considerations, 4.3.2 geo-technical report, bearing pressure etc.	04	06
4	Labour compliment	8.1 Types of labour required 8.2 Labour compliment, labour and staff required for spinning and weaving based on workload consideration. 8.3 Use of mathematics for number of operations in deciding the workload.	04	06

Section II

5	Civil/Building Construction	5.1 Consideration in building design, size, shape and configuration of building. 5.2 Architectural & structural aspects of textile mill building 5.3 General principles of building construction & building functions 5.4 Types of factory buildings 5.5 Types of building construction 5.6 Material for construction with special reference to walls, roofs, floors, false ceilings, fire resistance, sound proof, etc. 5.7 Colour schemes for buildings, interior & machinery in textile mills.	10	10
6	Materials Handling	6.1 Introduction, Definition and functions 6.2 Principles of materials handling 6.3 Material handling methods, engineering and economic factors, relationship to plant layout 6.4 Selection and types of material handling equipments 6.5 Study of different types of equipments used for materials handling in spinning, weaving, knitting mills.	06	08
7	Costing	7.1 Introduction, definition, classification. 7.2 Classification of costing methods 7.3 Marginal costing and Break even analysis 7.3.1 Classification of costs 7.3.2 Assumptions of break even analysis 7.3.3 Break even chart, Break even point, Margin of safety and angle of incident 7.3.4 Marginal cost, Contribution, 7.3.5 P/V ratio and its significance 7.3.6 Methods to improve P/V ratio	16	22

		7.3.7 Problems based on break even analysis and marginal costing 7.4 Standard costing 7.4.1 Classification of Standard cost 7.4.2 Methods to determine standard costing 7.4.3 Advantages and limitations of standard Costing 7.4.4 Types of variances 7.4.5 Significance of Revision Variance 7.4.6 Problems based on standard costing 7.5 Depreciation 7.5.1 Introduction 7.5.2 Methods of depreciation 7.5.3 Problems based on depreciation		
		Total	64	80

Reference Books

- 1) Textile Project Management by A. Ormerod, The Textile Institute Publication.
- 2) Project, Planning Analysis, Selection Implementation & Review by Prasanna Chandra, Tata McGraw Hill Publishing Co. Ltd.
- 3) Plant location, Layout & Maintenance by Ruddele Reed.
- 4) Industrial Organisation & Engg. Economics T.R. Banga & S.C. Sharma, Khanna Publishers, Delhi. 20
- 5) Norms for Process Parameters, Productivity etc. ATIRA, BTRA, SITRA, NITRA.

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Man-made fibre production and processing
Subject Code : 136TM63

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		Pract.		Oral		Term work		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
4	-	-	3	80	32	20	100	40		-	-	-	-	-	100

Rationale:

This subject covers Polymer their classification, raw material used for man-made fibre production, properties and their applications, Spin finishes, texturing, blending and application oriented properties of some High performance fibres.

Objectives:

Learn in detail classification of polymers the man-made fibre their manufacturing processes, properties and application. Spin finishes importance in manmade spinning and their types Texturing of filaments.

Syllabus

Part I:- Theory

No	Topic	Contents	L	M
Section I				
1	Classification & synthesis of various polymers Polymerization	Types & reactions, chain growth, step growth, condensation, addition, free radical, anionic, cationic polymerization.	04	6
2	Raw Material in Manmade Fibre production.	Commercial routes to produce Man-made Fibre raw materials e.g. Hexamethylene diamine, caprolactum, TPA, MEG, ACN	04	6
3	Synthetic fibre-Production techniques	Detail discussion Techniques – melt, dry and wet spinning techniques of manufacturing of man made fibres.	06	8
4	Synthetic fibre-Production	I) Polyamide: Nylon 6 & Nylon 66 fibres: Production (Melt spinning), Production flow chart, Physical & chemical properties, And applications. II) Polyester (Polyethylene Terephthalate) fibre: Production (DMT & TPA Route), Production flow chart , Physical & chemical properties, applications. III) Polypropylene fibre: Production (Suspension), Physical & chemical properties, applications. IV) Polyacrylonitrile Fibre: Acrylic fibres: Production (Dry spinning Method), Production flow chart , Physical & chemical properties, applications. Modacrylic fibre: Physical & chemical properties, applications	10	20

		Section II		
1	Regenerated Fibres	i) Viscose rayon: Raw Material, Production (Wet spinning Method), Physical & chemical properties, applications, ii) Introduction to Acetate & Triacetate fibres, Lyocell fibres.	06	10
2	Spin Finishes in manmade fibre production	Chemical constitution, Desirable properties, Functions, Method of Application of Spin finishes. Spin finishes for Staple fibre, Tow to top conversion. Blending- Purpose and process outline. Concept of blend evenness and measurement.	06	12
3	Properties and application of High Performance fibres	Carbon fibre, Glass fibre Poly Tetra Fluoro Ethylene (PTFE), Sulphur Fibre, Poly Methyl Mehta Acrylate(PMMA) , Polybenzimidazole fibre,	04	6
4	Texturing	Textured yarns – Types, special features, Uses and properties. False twist texturing process – process, feed material characteristics and machines. Draw texturing. Comparison between pin spindle and friction disc. New developments in friction texturing. Air Jet texturing – Process variables and yarn properties. Study of gear crimping, stuffer box, Knife edge crimping, Knit-de knit processes.	08	12
Total			48	80

Text Books:

1. Manufactured fibre technology– V. B. Gupta and V. K. Kothari, Chapman & Hall Publications, 1997.
2. Production of Synthetic Fibres by A. A. Vaidya, PHI Pub 2003
3. Textile Yarns by B. C. Goswami, J. G. Martindale & Seardino.
4. Man-made Fibres and their Processing-Volume 6, by Werner Klein, Published by The Textile Institute, First edition 1994.
5. Polyamides, Polyesters, Polyolefins and Acrylics, Woodhead Publishing Ltd.

Reference Books:

1. A Text Book of Man-made Fibre Science & Technology– Mishra S.P., New Age International Publishers
2. Texturing Technology, Woodhead Publishing Ltd.
3. Guide to texturing and crimping – by R.S.Gandhi

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Technical Textiles
Subject Code : 136TM64

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
3	1	0	3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale:

This subject covers technical textiles like geotextiles, industrial fabrics like filtration fabrics, coated fabrics and other miscellaneous functional textiles. The subject deals with differential equations of first order and first degree and statistics. These topics are essential for the students to understand the sciences and technology in a better way.

Objectives:

- Introduce the students to the unconventional uses of textiles in medical, sports and the fields of agriculture.
- Learn in detail the various finishing requirements of these textiles to be used as technical textiles.

Syllabus

No	Topic	Contents	Lecture Hours	Marks
Section I				
1	Introduction to technical textiles	Definition, Significance Difference between technical textiles and apparel textiles. Classification of technical textiles, their attributes, functional values and manufacturing techniques.	02	06
2	Hi Tech Fibres	Speciality/High performance fibres: Ultra fine, micro fibres, nano fibers, Hollow fibers, Aramid fibers, Carbon fibers, glass fibers	04	6
3	Textile Composites	Reinforcement materials, Matrix materials, Classification of textile reinforcement structures , Preforms, Prepregs. Manufacturing methods: Hand and Machine lay-up, Vacuum bag and pressure bag moulding, Injection moulding, Autoclave, Pultrusion, Compression moulding, Resin Transfer moulding Composite Testing- Compression test, Flexural test, Impact toughness test	06	8
4	Fabric finishing, coating and lamination	Finishes: Flame retardant finishes, Water and soil repellent finishes and antimicrobial finishes. Coating: Coating techniques such as knife coating, Calendar coating, roller, nip, dip and cast coating, Extrusion coating, spray coating, Foam coating, Powder coating	08	12

		Laminates: Classification – Rigid, Flexible Fabric & Waterproof breathable laminates Types of laminates – Sheet stock, Post formed, Tubes and Rods, Molded laminated Plastics, Honeycomb laminates		
5	Agrotextiles, Industrial textiles	Shade nets: Classification, manufacturing methods and end uses. Tarpaulins, conveyors belts.	04	08

		Section II	Lecture Hours	Marks
6	Geotextiles	Types of geotextiles: Geogrids, geomembranes and woven and nonwoven geotextiles Function of geotextiles- separation, filtration, reinforcement, drainage and protection. Geotextile properties- physical, mechanical, hydraulic, environmental. Application of geotextiles- roadwork, railway works, erosion control, drainage systems.	05	8
7	Medical textiles	Fibers used: Commodity and Specialty fibers Characteristics of materials used, classification- Surgical textiles- Textiles for implant: Sutures, Soft tissue, Hard tissue, Vascular, Biomaterials for ophthalmology, Dental Biomaterials Non-implantable textiles and extracorporeal devices, Healthcare and hygiene products such as bandages, dressings, surgical gowns, cloths, wipes, etc.	05	8
8	Filtration fabrics	Definition, objective, Mechanism of dry filtration – Interception, Inertial deposition, Random diffusion, Electrostatic deposition, Gravitational forces Mechanism of wet filtration – Screening, Depth filtration, Cake filtration Filtration Equipments – Filter bags, Rotary drum filters, Rotary disk filters, filter press, Belt filters Dry filtration – Dust Filters – Filters in air conditioning e.g. HVAC, HEPA and ULPA Wet filtration – Solid-liquid separation, e.g. bolting cloth. Filter design for dry and wet filtration –Filtration requirements, cost	04	8
9	Automotive and Defense textiles	Automotive Textiles: Seat belts, air bags, seat covers, Conveyor and transmission belt fabrics, Tyre cord fabrics (tyre cord yarn) Defense Textiles: Parachute fabrics, tent fabrics, Protective clothing: Ballastic Protection- principle, Fibers and Fabrics used, Chemical and Biological Protection, Nuclear Protection, Environment Protection, Camouflage bulletproof fabrics, flame retardant fabrics.	06	8
10	Sportech and Packaging textiles	Nets, balls, sports surfaces - manufacturing methods and textile packaging materials	04	08
		Total	48	80

Learning Resources:-

Text Books:

- 1 Wellington Sear Handbook of Industrial Textiles – Technomic Publishing Co. Inc.

References :

- 1 Industrial Textiles- Jarmila Seclova (Editor).
- 2 Hand book of Technical Textiles, Edited by A R Horrocks and S C Anand, University of Bolton, UK, Woodhead Textiles Series No. 12, October 2000
- 3 Technical Textiles: Technology, Developments and Applications – Dr. V. K. Kothari, IAFL Publications, Progress in Textiles: Science and Technology, Volume 3

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Apparel Merchandising
Subject Code : 136TM65E1

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
3	1	0	3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale:

The latest trend in textiles is high demand for fashion oriented, value added readymade garments both locally and globally. The subject deals with apparel merchandising and apparel export merchandising, apparel retailing merchandising and visual merchandising of garments. In this subject export documentation and shipment procedure will help the student to understand the export related procedures.

Syllabus

No	Topic	Contents	Lecture Hours	Marks
Section I				
1	Merchandising	Introduction to Merchandising Significance of Merchandising in Apparel industry Categories of Apparel Merchandising Process flow of Apparel Merchandising	02	04
2	Apparel Fashion Merchandising	Concept of fashion Principles of fashion Fashion cycle Fashion cycle leadership theories Organization for fashion merchandising Terminologies of fashion merchandising Fashion apparel categories Apparel fashion merchandising process Fashion forecasting Fashion shows	11	16
3	Apparel Export Merchandising	Introduction and principles Process flow – Buying sourcing, Buying communication, Enquiry and sampling, Pre-costing and reply, Order confirm, Master Planning Scheduling or critical path, Programming Samples and its types, Accessories sourcing and purchase, Inspection, Testing, Cutting, Approvals	10	16
Section II				
4	Apparel Merchandiser	Functions of Merchandiser Traits of a Merchandiser	02	04
5	Final Inspection	Types of final inspections Method of sample selection for inspection AQL, Defects, Inspection procedure	05	07

6	Shipment	Shipment flow, Container details, Leasing methods Document negotiation process, Functions of forwarding agents, Port and shipping lines	05	07
7	Export Documentation	Introduction to export documentation, Commercial Documents, Regulatory documents, Documents related to goods, Documents related to shipment Documents related to payments, Documents related to Inspection, Documents related to excisable goods	05	07
8	Visual Merchandising	Introduction to visual merchandising Functions of visual merchandising Elements of visual merchandising Visual merchandising techniques	04	08
9	Apparel retail merchandising	Introduction, Functions, Types of retailing Apparel retail merchandising process, Consumer Vs retailing, Prospects of apparel retailing in India	04	07
		Total	48	80

Learning Resources:-

Text Books:

- 1 Apparel Merchandising, An Integrated Approach, M. Krishnakumar, Abhishek Publications, Chandigarh, First Edition, 2010.

References :

- 1 Marketing Textiles, From Fiber to Retail, Allen C. Cohen, Fairchild Publication, New York, 1989

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Textile Industrial Engineering
Subject Code : 136TM65E2

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	1	0	3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale:

To know / learn the basic concepts of Industrial Engineering.
 To learn productivity, work-study, work measurement.
 To understand job evaluation and merit rating.
 To import knowledge of Network Analysis, CPM & its application.
 To know inventory control techniques, different types of control charts, operation research & tools of Operational Research.

Syllabus

No	Topic	Contents	Lecture Hours	Marks
Section I				
1	Productivity	Introduction to Industrial Engineering Definition of productivity Reasons for low productivity Techniques for improving productivity	02	04
2	Work study	2.1 Introduction 2.2 Definition of work study and its significance 2.3 Comparison between Method study and Work Measurement 2.4 Procedure of Work study 2.5 Method study – definition 2.6 Objective of Method study 2.7 Procedure of Method study 2.8 Recording Methods 2.9 Introduction to work Measurement 2.10 Definition of work measurement 2.11 Objectives of work measurement 2.12 Work measurement techniques 2.13 Time study 2.14 Job evaluation and merit rating	10	12
3	Network Analysis	3.1- Critical path method 3.2 PERT 3.3 CPM 3.4 Comparison between PERT and CPM and its application 3.5 Problems based on PERT and CPM Network	06	14
4	Inventory Control	4.1 Introduction 4.2 Economic Order Quantity	06	10

		4.3 ABC analysis 4.4 Study of EOQ Model		
		Section II		
5	Statistical Quality Control	5.1 Introduction to Statistical Quality Control (SQC) 5.2 Objectives of Quality control 5.3 Principles of quality control 5.4 Advantages of quality control 5.5 Advantages of Statistical quality control 5.6 Sampling method, Destructive and non-destructive testing	08	12
6	Control Charts	6.1 Introduction 6.2 Types of control chart - X, R, p, np and C chart 6.3 Advantages and limitation. 6.4 Purpose of control charts 6.5 Comparison between x R chart and p chart 6.6 Problem based on control charts	08	14
7	Operational Research	7.1 Introduction to Operation Research (O.R.) 7.2 Tools of O.R. 7.3 Formulation of LP problem 7.4 Solving LP problem using graphical and simplex method	08	14
		Total	48	80

Reference Books

1. Introduction to work study by ILO
2. Industrial Engineering by Dr. B. Kumar.
3. A text book of Industrial Engg. and Management system by Dr. S. Dalela and Mansoor Ali

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Maintenance Management
Subject Code : 136TM65E3

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
3	1	0	3	80	32	20	100	40	-	-	-	-	25	100	125

Rationale:

The subject is designed to give the information of maintenance management. This subject will help the student to understand requirement of maintenance and its significance in brief.

Objectives:

- To relate the importance and objectives of maintenance management
- To understand the pattern in which failures occur.
- To realize the existence of different systems of maintenance.
- To realize the need for letting unplanned emergency maintenance
- To realize that formal costing and budgeting to encourage prediction and pre- planning of maintenance activities.
- To comprehend the efforts involved in maintenance planning and control.
- To make students understand the concepts of maintenance and safety and their importance in the industry.
- To deal with the planning and control of various maintenance engineering
- To learn the basic and recent trends in maintenance management.
- To deal effectively with the various types of hazards in industry and related safety issues.

Concept domain -

- Understanding of different type of maintenance system and its application.
- understanding of maintenance procedure of plant, maintenance cost, failure cost and its impact on profitability

Knowledge domain –

- Understanding of relation between production, quality, machine life, failure prevention cost and overall profitability with maintenance.

Syllabus

No	Topic	Contents	L	M
Section I				
1	Introduction	Introduction, objectives, importance of maintenance management. Functions and responsibilities of maintenance department.	03	05
2	Types of Maintenance	Types of maintenance systems Corrective (or) breakdown maintenance. Scheduled maintenance Preventive maintenance Predictive maintenance Condition Based Management System Proactive Maintenance	10	16

		Risk based maintenance Design-out maintenance		
3	PQRM	Productivity, Quality, reliability & maintainability (PQRM): Productivity, Maintenance productivity, Quality, Quality Circle, Reliability and its importance, Difference between reliability, reliability by redundancy, mean time between failure and Concepts of availability, maintainability	06	10
4	Maintenance planning, scheduling	Maintenance planning, scheduling and control: Planning, Steps in planning, Planning techniques, Scheduling, scheduling principles, schedule types and techniques, Gantt Chart, Bar chart, PERT and CPM, Short term and long term planning.	05	08

Section II				
4	Maintenance Effectiveness, Performance Evaluation and audit	Maintenance performance indices Maintenance effectiveness and performance evaluation/audit. Use of concepts like kaizen and quality circles Defect list generation and defect failure analysis	06	10
5	Total Productive Maintenance	Total productive maintenance: Introduction, definition, applications, basic concepts, evolution, Pillars of TPM, Comparison between TPM and TQM, Increase in productivity through TPM, Steps in TPM implementation	10	16
6	Maintenance budgeting, costing and cost control	Introduction, Classification of Maintenance cost, Maintenance cost components, Maintenance cost analysis, Purpose of cost control, Maintenance budget.	05	08
7	TERO Technology	TERO technology – latest concepts Training (HRD) of maintenance personnel Safety assessment, work environment, fire prevention and control, management of emergencies.	03	06
		Total	48	80

Learning Resources:-

Text Books:

1. Maintenance Engineering by Sushilkumar Srivastava, S. Chand publishers, edition 2010.

Reference Books:

- 1 Maintenance Engineering and Management by R. C. Mishra and K. Pathak, Published by Prentice- Hall of India Pvt. Ltd., 2004.
- 2 Reliability engineering - by S.Srinath, East west press, 3rd edition
- 3 Industrial Maintenance Management by Sushil Kumar srivastava, S. Chand & company, new Delhi, 1998

Course name : Diploma in textile manufacture
Course code : DTM
Semester : Sixth
Subject title : Textronics
Subject code : 136tm65E4

Teaching Scheme			Paper Hours	Examination scheme										Total Marks	
L	T	P		Theory		Test	Total		Practical		Oral		Term work		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
3	1	-	3	80	32	20	100	40	-	-	-	-	25	10	125

Rationale:

The modern Textile mill is fully automised and different types of motors and other types of electronic devices are used. A student should have a good background in electronics.

Objectives:

This course gives the student an insight into Microprocessor, Sensors, PLC, Diodes, Triodes, Semiconductors, Triac, Diac and logic gates.

Syllabus

No	Topic	Contents	Lecture hours	Marks
Section I				
1	Microprocessor and Microcontroller	Introduction, 8085 & 8051 features. Basic 8085 and 8051 architecture and its functional blocks. 8085 microprocessor IC pin outs and signals, address, data and control buses and 8051 microprocessor IC pin outs and ports 8085 & 8051 features.	8	10
2	Servo motors	Introduction, Construction and working principle. Applications in textile.	4	10
3	Sensors	Introduction, Speed sensors variable reluctance sensor, chemical sensor, moisture sensor, temperature sensor. Sensors in stop motions and Metal detectors	10	15
4	PLC	PLC and its applications	2	5
Section II				
5	Semiconductor devices	Diodes, PN Junction diode, Transistors, FET, UJT, BJT, Biasing of transistors, special semiconductor devices, SCR, Triac, Diac	10	15
6	Digital electronics	Logic gates, fundamentals of binary number systems. Conversion of number systems	4	10
7	Automation in textile	Fault detection in yarn & fabric ,auto doffing, transportation in mill ,ware house autolevellers, microswitches	10	15
Total			48	80

Reference books:

1. Mazidi & Mazidi, The 8085 microcontroller & embedded system, using assembly and C, 2nd edi, pearson edu.

2. Microprocessor and interfacing 8085, Douglas V Hall, Tata Mc Gram Hill.
3. Microprocessor-Architecture, programming and application with 8085, gaonkar, penram International.
4. Electronics By V. K. Mehta, S. Chand & Company, 2007
5. Electronic Controls for Textile Machinery- NCUTE By Hiren Joshi, Gouri Joshi, A. K. Gupta
6. "Understanding Smart Sensors" by Randy Frank

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Project-II
Subject Code : 136TM66

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme											Total Marks
L	T	P		Theory		Test	Total		Pract.		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max	Min	
-	-	6	-	-	-	-	-	-	-	-	50	20	50	20	100

Rationale:

The students are expected to take up any subject related to textiles and study it in detail and make a presentation on their plan of action.

In the next semester provision is made for the students to conduct a study or fabricate the elements if necessary and present them as a continuation of their project.

Objectives:

The students must be able to independently choose a certain topic, collect materials related to it and present a project report.

Syllabus

1. Creating awareness about various research magazine and periodicals.
2. Study how to do the reference work for the further reading.
3. Doing the reference work.
4. Presentation of project work.
5. Submission of project thesis.

Course Name : Diploma in Textile Manufacture
Course Code : DTM
Semester : Sixth
Subject Title : Entrepreneurship Development
Subject Code : 136HM67

Teaching and Examination Scheme:–

Teaching Scheme			Paper Hours	Examination Scheme										Total Marks	
L	T	P		Theory		Test	Total		Practical		Oral		Termwork		
				Max	Min		Max	Min	Max	Min	Max	Min	Max		Min
2	-	-	-	-	-	-	-	-	-	-	-	-	25	10	25

Rationale:

Engineers can play very important role in economic development of the nation and wealth creation by innovation and entrepreneurship. This course aims to develop among the engineering student awareness and abilities to be entrepreneurs.

Objectives:

1. To prepare a ground where the students view entrepreneurship as a desirable and feasible career option.
2. To build the necessary competencies and motivation for a career in entrepreneurship.

Syllabus

No	Topic	Contents	L
1	Introduction	Concept, characteristics, functions, entrepreneurial competencies.	2
2	Entrepreneurial challenges	Live examples of challenges faced by entrepreneurs	2
3	Business idea/opportunity recognition and selection.	Idea generation, Project identification, selection, formulation and appraisal	4
4	People: Making a team.	Selection and training.	2
5	Evaluating markets and customers.	Market evaluation and marketing strategies	4
6	Business plan	Writing a business plan	8
7	Financing the business	Sources of finance, venture capitalist, Institutional finance. Writing a business plan	4
8	Incorporating a company.	Private limited and public limited company	4
9	Evaluating the value of enterprise	Valuation of the business	2
		Total	32

Assignments: Individual and group assignments

- on 1 Idea generation
- 2 Business plan
- 3 Project appraisal
- 4 Marketing
- 5 Venture capitalist
- 6 Visit to an enterprise
- 7 Case studies

Text book:

Entrepreneurial Development: S.S.Khanka (S.Chand)

Reference book:

The successful Entrepreneur's Guidebook: Colin Barrow, Robert Brown and Liz Clarke (Kogan Page India)