5.1 KNITTED STRUCTURE & ANALYSIS

L	T	P
2	-	-

RATIONALE

A diploma holder should have competency of analyzing knitted fabric because he has to work in knitting industry where he has to develop different knits on machines. In order to perform these job responsibilities, knowledge, skills in knitting technology area are essential. Hence the subject.

DETAILED CONTENTS

1. Need of analysis of knitted fabric, and tools needed for analysis. (02 hrs)

2. Method of doing analysis of knitted fabric. (Representation through mesh structure, representation through technical notation.) (03 hrs)

3. Classification of different types of weft knitted structures. (03 hrs)

4. Classification of different types of warp knitted structures. (03 hrs)

5. Application of draft on graph paper for drafting and graphing of knitted structures. (03 hrs)

6. Important knitted structures and their technical notations with Symbolic representation-Plain, Rib, Eight Lock, Milano Rib, Purl, Tuck, Float, Stripes, Lecoste Knit, Accordian stitch, Half Cardigan, Full Cardigan, Single Pique, Roma Knit, Lace, Cable, Waffle, Swiss Double Pique . (08 hrs)

7. Yarn Parameters and properties. (04 hrs)

8. Fabric Parameters and Properties. (02 hrs)

9. Defects in Fabrics. Defects related to yarn and related to knitting. (04 hrs)

In addition, the following aspects need to be discussed

i. Practice of analysis of given knitted structures.
ii. Analysis of knitted structures and drafting on graph paper.
iii. Preparation of new pattern for applications on weft and warp knitting machines
iv. Identification of given knitted samples, analyzing it and recommendation of machines on which it can be produced.
v. Fabric analysis for determination of GSM, CPI, WPI, SL, CL.
vi. Identify and analyze the given sample of fabric for the following particulars
    a) Course and wales per cm.
    b) Loop length

c) Technical graph
d) Cam order
e) Needle order

NOTE: There will be no practical examination. The questions from practice syllabus will be asked in theory paper.

INSTRUCTIONAL STRATEGY

The teacher is expected to tell the students the applications of this subject area in various fields. Emphasis should be laid on practical examples.

RECOMMENDED BOOKS

1. Circular Knitting by Chandrasekara Iyer; Mahajan Publishers, Ahmedabad

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	02	08
2	03	12
3	03	08
4	03	08
5	03	12
6	08	24
7	04	12
8	02	08
9	04	08
Total	**32**	**100**

5.2 CIRCULAR JACQUARD MACHINE- I

L	T	P
3	-	5

RATIONALE

A diploma holder in Knitting Technology must be aware of the principles and working of power socks machine. In addition he should have a thorough knowledge of the function of different mechanisms of power operated automatic machines. Hence this subject.

DETAILED CONTENTS

1. Definition of Jacquard (02 hrs)
2. Introduction to different types of Jacquard made on Double Jersey & Single Jersey Circular Knitting machines (04 hrs)
3. Needle Selection through cam plates (02 hrs)
4. Different butt position with different set-outs and cam arrangements (03 hrs)
5. Introduction of automatic socks knitting machine and its working (04 hrs)
6. Cam Set of automatic socks knitting machine (05 hrs)
   - 6.1 With revolving cylinder
   - 6.2 With stationary cylinder
7. Controlling Chain & Drum (03 hrs)
8. Quadrant Gear (03 hrs)
9. Picker Mechanism (03 hrs)
10. Speed Gear (03 hrs)
11. Ratchet Wheel and Pawls (03 hrs)
12. Yarn delivery devices (08 hrs)
    - 12.1 Storage devices
    - 12.2 Tape delivery equipment
    - 12.3 Positive feed device
    - 12.4 Storage yarn feeder with rotating coiler
    - 12.5 Storage yarn feeder with stationary coiler
    - 12.6 Yarn furnishing wheel
    - 12.7 Taper feeding wheel

13. Fabric take down (05 hrs)

13.1 Fabric spreader

13.2 Fabric tensioning device with mechanical drive

13.3 Electrical fabric tensioning & winding device from Mayer & Cie.

LIST OF PRACTICALS (to be performed in Circular Jacquard Machine Section)

1. Demonstration and setting of different parts of different machines such as:- feeders, tension devices, yarn delivery devices, cam sets, drawing off mechanism, driving mechanism, stop motions and setting of stitch quality.
2. Demonstration of chain in power socks machine preparation and setting of chain according to length of socks on power socks machine.
3. Demonstration of power socks machine and its parts like speed gear, quadrant gear, star wheel, ratchet wheel pawls.
4. Preparation of heels and toes of different sizes.
5. Preparation of nylon socks of different sizes.
6. Preparation of terry socks of different sizes.
7. Maintenance of above machines (preventive maintenance and routine maintenance).

Note: Sample book is to be prepared in which diagrams, short explanation of experiments and small samples are to be fixed along with their explanation. Above samples should be knitted on different ganges.

INSTRUCTIONAL STRATEGY

The teacher should lay emphasis on understanding of basic concepts and various terms used in the subject. Practical exercises will reinforce various concepts. Industrial exposure must be given by organizing visits.

RECOMMENDED BOOKS

1. Knitting Technology by D.J. Spencer; Mahajan Publishers, Ahmedabad.
2. Circular Knitting by Chandrasekhar Iyer; Mahajan Publishers, Ahmedabad.
3. Knitting Technology by Ajgaonkar; Sewak Publication, Mumbai

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	02	04
2	04	08
3	02	04
4	03	06
5	04	08
6	05	12
7	03	06
8	03	06
9	03	06
10	03	06
11	03	06
12	08	16
13	05	12
Total	**48**	**100**

5.3 WARP KNITTING TECHNOLOGY-II

L	T	P
3	-	5

RATIONALE

A diploma holder in Knitting Technology is responsible for controlling the production of the knitted products. For this purpose, knowledge and skills about warp knitting machines. Their mechanism and working need to be imparted to him. Hence this subject.

DETAILED CONTENTS

1.	Principle and method of Yarn Laying	(04 hrs)
2.	Warp Knit Structures. Tricot Laps, Atlas Lap, Cord Laps, Locknit Reverse Locknit, Sharkskin, Queens cord, Satin, Velour & Velvet structure, Over pole structure.	(06 hrs)
3.	Characteristics of warp knit structures:- Angle lace, Laid in stitch, knock -off, shell stitch, cut pressure, string west, hair nets, shoe laces, thermal cloth, ribs, fall plate, plush and pile in single and two needle bar warp, needle set out and mashes.	(06 hrs)
4.	Nesting process with guide bars.	(04 hrs)
5.	Analysis of lace knitted fabrics.	(04 hrs)
6.	Laces, types of laces and their manufacturing. Types of elements in use for producing laces and types of machine in use.	(04 hrs)
7.	Introduction to Milanese Fabrics and Machines.	(04 hrs)
8.	Introduction of Simplex fabrics.	(04 hrs)
9.	Introduction to Jacquard Raschel Machine, its working and maintenance.	(03 hrs)
10.	Electronic Jacquard mechanism	(03 hrs)
11.	Technical textiles (Industrial or Technical application of warp knitted fabrics)	(03 hrs)
12.	Defects in warp knitted fabrics their causes and remedies	(03 hrs)

LIST OF PRACTICALS

1. Industrial visit for demonstration of latest machines.
2. Drafting of basic knits and preparing self designing on rib raschel machine.
3. Practice on adjusting of different mechanisms of lace Raschel machine on the quality of fabric.
4. Preparation of chains and their application on Lace Reschel machine.
5. Analysis of basic warp knitted fabric.
6. Demonstration and working of Raschel machine and crochet machine through industry visit. (on shop floor in production unit)
7. Designing and setting of fall plate fabric machine.
8. Study of knitted structure and their reproduction.

INSTRUCTIONAL STRATEGY

The teacher should lay emphasis on understanding of basic concepts and various terms used in the subject. Practical exercises will reinforce various concepts. Industrial exposure must be given by organizing visits.

RECOMMENDED BOOKS

1. Warp Knitting Technology by Prof. D.B. Ajgaonkar; Sewak Publication, Mumbai
2. Knitting Technology by D.J. Spencer; Mahajan Publishers, Ahmedabad
3. Warp Knitting Production by Dr. S.Raz; Melliand Textilberichte GmbH, Germany

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	04	08
2	06	14
3	06	14
4	04	08
5	04	08
6	04	08
7	04	08
8	04	08
9	03	06
10	03	06
11	03	06
12	03	06
Total	**48**	**100**

5.4 GARMENT MANUFACTURING TECHNOLOGY-I

L	T	P
3	-	4

RATIONALE

Knitted fabric is used in the production of various knitted garments. Knitted fabric require special handling while cutting and stitching. So students should have special knowledge of making garments. Hence the subject.

DETAILED CONTENTS

1. Equipments use in cutting and making up of knitted garments (03 hrs)
2. Stitch Geometry and different forms of stitches (03 hrs)
3. The seaming machine and chain stitch machine (03 hrs)
4. Fundamental of cutting and making up of knitted fabric garment (03 hrs)
5. Different types of human body (03 hrs)
6. Types of seams, types of darts, types of pleats and gathers (03 hrs)
7. Kind of Hems (03 hrs)
8. Method of taking ladies and gents measurements. Important points to note when taking measurements (04 hrs)
9. Classification of various types of cut underwear & outer wear garments from cotton fabric produced on interlock, sinker body and rib machines. Drafting of vests, sandow vests (R.N.), under wears, briefs and under pants (06 hrs)
10. Types of yarn, threads, run in ratios, number of stitches per unit length (04 hrs)
11. Stitch forming action and timing of stitching elements of m/c and their setting (04 hrs)
12. Types of sewing and seaming needles. no. and size of elements requirement according to the type of m/c and garments (03 hrs)
13. Maintenance and setting of machines (02 hrs)
14. Pattern, types of Pattern, advantage of Pattern (02 hrs)
15. Lay out of Pattern on cloth (02 hrs)

LIST OF PRACTICALS

1. Practice on threading up the machines, necessary precaution during operation.
2. Practice on adjustment of stitch length and stitches per units length. Tension setting on feed yarns for the setting of quality stitch work.

3. Practice on adjustment of knives of the three thread over lock machine.
4. Working of different types of machines, tools employed for sewing, seaming and stitching of knitted fabric garments.
5. Drafting and Cutting of vests, sandow vests, half sleeves, round neck, V. neck vests sports shirts, under wears full drawers with elastic, bathing trunks, bathing costumes.
6. Practice of sewing, locking, seaming and pressing processes on above said articles. with machine sewing, chain stitch, over locks with two/three/four threads, flat lock with five/ fine threads. Cutters and fold stitching, flat lock machines.
7. Preparation of size charts, gents, ladies and children and its practical application.
8. Maintenance of machines and tools, lubrication of different parts of machines, preventive routine maintenance.
9. Practice on pressing of garments using iron.

INSTRUCTIONAL STRATEGY

Use of audiovisual aids should be made to show specialized operations. Expose the students to real life problems. Stress should be given to acquaint the students with relevant industrial practices.

RECOMMENDED BOOKS

1. Knitted Clothing Technology by Bracken Berry; Blackwell Publication Ltd.
2. Introduction to Clothing Manufacture by Cooklin; Mahajan Publishers, Ahmedabad
3. Metric Pattern Cutting for Menswear by Aldrich; Mahajan Publishers, Ahmedabad
4. The Technology of Clothing Manufacture by Carr & Latham; Mahajan Publishers, Ahmedabad

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	03	06
2	03	06
3	03	06
4	03	06
5	03	06
6	03	06
7	03	06
8	04	08
9	06	14
10	04	08
11	04	08
12	03	06
13	02	05
14	02	05
15	02	04
Total	**48**	**100**

5.5 TECHNICAL TEXTILES AND ITS APPLICATIONS

L	T	P
3	-	2

RATIONALE

This subject has been introduced to familiarise the students with technical textiles and its future prospects, technical fibers, yarns and fabric structure and various application of technical textiles

DETAILED CONTENTS

1 Technical Textiles introduction Definition & Scope, Development Processes, Applications, Globalizations, Future prospects of technical textile industry (06 hrs)

2 Brief introduction to Technical fibers- Conventional and New developed fibers and their Applications (06 hrs)

3. Brief introduction to Technical yarns (04 hrs)

4. Technical Fabric Structures (14 hrs)

- Brief study of woven and knitted fabrics
- Brief study of Non woven structure –Introduction, methods of batt production, different methods of web laying, flash spinning, melt blown, different methods of bonding, Hydro entanglement process.

5. Brief introduction to Textile Reinforced – Composite material (04 hrs)

6. Finishing of Technical Textiles- Introduction, Processes, Mechanical, Heat setting and Chemical process (05 hrs)

7. Coating of Technical textiles- Introduction, methods of coating, fusible interlining and laminating (03 hrs)

8. Application of Technical Textiles – Medical textiles, Geotextiles, Defence textiles, Transport textiles, Automotive textiles and others (06 hrs)

LIST OF PRACTICALS

1. Tensile strength including grab test and strip test of Technical Textiles
2. Air-permeability test of Technical Textiles
3. Porosity test of non woven/woven fabrics of Technical Textiles
4. Water permeability test of Technical Textiles
5. Thickness test of Technical Textiles
6. Puncture Resistance of Technical Textiles

7. Shear Test of geotextile
8. Transmissivity of geotextile
9. Permeability of geotextiles

INSTRUCTIONAL STRATEGY

The teacher should lay emphasis on understanding of basic concepts and various terms used in the subject. Practical exercises will reinforce various concepts. Industrial exposure must be given by organizing visits.

RECOMMENDED BOOKS

1. The design of Textile for Industrial Application - Textile Institute
2. Weaving Machine Mechanisms & Management – Talukdar M.K, D.B. Ajgaonkar, P.K. Sriramulu, Mahajan Publishing Pvt.Ltd. Ahmedabad, 1998
3. Geotextiles Handbook - T.S. Ingold & Miller K.S.
4. Wellington Sears Handbook of Industrial Textiles - By Sabit Adanur, Technomic Publishing Co. INC, Lancaster, Basel, 1995
5. Industrial Applications of Textile- by R.S.Goy & J.A.Jenkins Textile progress-1970, March Vol. II No.1
6. Industrial Applications of Textiles- by K.L.Floyd & H.M.Taylor Textile progress - 1970, Vol.VI, No.2
7. High performance fibres, Bajaj P. and Sengupta, A.K., the Textile Institute, Manchester
8. Industrial Applications of Textiles: Textiles for Filtration and Coated Fabrics, Pushpa Bajaj and A.K.Sengupta, the Textile Institute, Textile Progress, Vol 14, No.1
9. Automotive Textiles, S. K. Mukhopadhyay and J. F. Partridge, the Textile Institute, Textile Progress, Vol 29, No.1/2
10. Textiles in sports, R.Shishoo, Woodhead Publication, the Textile Institute
11. Paper of International Conference on Non Wovens Textile Institute North India, Section, India 1992, by Prof. M.L. Gulrajani, Dept. of Text. Tech., IIT Delhi

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted (Hrs)	Marks Allotted (%)
1	06	12
2	06	12
3	04	09
4	14	30
5	04	09
6	05	10
7	03	06
8	06	12
Total	**48**	**100**

5.6 ENVIRONMENTAL EDUCATION

L	T	P
3	-	-

RATIONALE

Education about environment protection is a must for all the citizens. In addition, a diploma holder must have knowledge of different types of pollution caused by industries and construction activities so that he may help in balancing the eco system and controlling pollution by adopting pollution control measures. He should also be aware of environmental laws related to the control of pollution.

DETAILED CONTENTS

1. Definition, Scope and Importance of Environmental Education (02 hrs)

2. Basics of ecology, biodiversity, eco system and sustainable development (03 hrs)

3. Sources of pollution - natural and manmade, causes, effects and control measures of pollution (air, water, noise, soil, radioactive and nuclear) and their units of measurement (12 hrs)

4. Solid waste management – Causes, effects and control measures of urban and industrial waste (06 hrs)

5. Mining and deforestation – Causes, effects and control measures (04 hrs)

6. Environmental Legislation - Water (prevention and control of pollution) Act 1974, Air (Prevention and Control of Pollution) Act 1981 and Environmental Protection Act 1986, Role and Function of State Pollution Control Board, Environmental Impact Assessment (EIA) (10 hrs)

7. Role of Non-conventional Energy Resources (Solar Energy, Wind Energy, Bio Energy, Hydro Energy) (04 hrs)

8. Current Issues in Environmental Pollution – Global Warming, Green House Effect, Depletion of Ozone Layer, Recycling of Material, Environmental Ethics, Rain Water Harvesting, Maintenance of Groundwater, Acid Rain, Carbon Credits (07 hrs)

INSTRUCTIONAL STRATEGY

The contents will be covered through lecture cum discussion sessions. In addition, in order to have more appreciation of need for protection of environment, it is suggested that different activities pertaining to Environmental Education like video films, seminars, environmental awareness camps and expert lectures may also be organized.

RECOMMENDED BOOKS

1. Environmental Engineering and Management by Suresh K Dhameja; SK Kataria and Sons, New Delhi.
2. Environmental Science by Dr. Suresh K Dhameja; SK Kataria and Sons, New Delhi.
3. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
4. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.
5. Environmental Science by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd. Delhi.
6. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.
7. Environmental Studies by Erach Bharucha; UGC University Press.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted for Lectures (Periods)	Marks Allotted (%)
1	02	04
2	03	06
3	12	24
4	06	12
5	04	10
6	10	20
7	04	10
8	07	14
Total	**48**	**100**

5.7 EMPLOYABILITY SKILLS – I

L	T	P
-	-	2

RATIONALE

The present day world requires professionals who are not only well qualified and competent but also possess good communication skills. Our diploma students not only need to possess subject related knowledge but also soft skills to get good jobs or to rise steadily at their work place. The objective of this subject is to prepare students for employability in job market and survive in cut throat competition among professionals.

DETAILED CONTENTS

1. Writing skills (08 hrs)

   i) Official and business correspondence

   ii) Job application - covering letter and resume

   iii) Report writing - key features and kinds

2. Oral Communication Skills (20 hrs)

   i) Giving advice

   ii) Making comparisons

   iii) Agreeing and disagreeing

   iv) Taking turns in conversation

   v) Fixing and cancelling appointments

3. Generic Skills (04 hrs)

   i) Stress management

   ii) Time management

   iii) Negotiations and conflict resolution

   iv) Team work and leadership qualities

PERSONALITY DEVELOPMENT CAMP

This is to be organized at a stretch for two to three days during fifth or sixth semester. Extension Lectures by experts or teachers from the polytechnic will be delivered on the following broad topics. There will be no examination for this subject.

1. Communication Skills
2. Correspondence and job finding/applying/thanks and follow-up
3. Resume Writing
4. Interview Techniques: In-Person Interviews; Telephonic Interview; Panel interviews; Group interviews and Video Conferencing etc.
5. Presentation Techniques
6. Group Discussions Techniques
7. Aspects of Personality Development
8. Motivation
9. Leadership
10. Stress Management
11. Time Management
12. Interpersonal Relationship
13. Health and Hygiene