



ANNA UNIVERSITY
Chennai-25.
Syllabus for

B.Tech. Textile Technology

GE034 Creativity, Innovation and New Product Development 2 0 2 100

1 . INTRODUCTION **8**

The process of technological innovation - factors contributing to successful technological innovation - the need for creativity and innovation - creativity and problem solving - brain storming - different techniques.

2 . PROJECT SELECTION AND EVALUATION **8**

Collection of ideas and purpose of project - Selection criteria - screening ideas for new products (evaluation techniques).

3 . NEW PRODUCT DEVELOPMENT **7**

Research and new product development - Patents - Patent search - Patent laws - International code for patents - Intellectual property rights (IPR).

4 . NEW PRODUCT PLANNING **7**

Design of proto type - testing - quality standards - marketing research - introducing new products.

Total No of periods: 30

LABORATORY:

Creative design - Model Preparation - Testing - Cost evaluation - Patent application.

References:

1. *HARRY NYSTROM, " Creativity and innovation", John Wiley & Sons, 1979.*
2. *BRAIN TWISS, " Managing technological innovation", Pitman Publishing Ltd., 1992.*
3. *HARRY B.WATTON, " New Product Planning ", Prentice Hall Inc., 1992.*
4. *P.N.KHANDWALLA - " Fourth Eye (Excellence through Creativity) - Wheeler Publishing ", Allahabad, 1992.*
5. *I.P.R. Bulletins, TIFAC, New Delhi, 1997.*

GE037 Intellectual Property Rights (IPR)

3 0 0 100

1 . UNIT I 5

Introduction - Invention and Creativity - Intellectual Property (IP) - Importance - Protection of IPR - Basic types of property (i. Movable Property ii. Immovable Property and iii. Intellectual Property).

2 . UNIT II 10

IP - Patents - Copyrights and related rights - Trade Marks and rights arising from Trademark registration - Definitions - Industrial Designs and Integrated circuits - Protection of Geographical Indications at national and International levels - Application Procedures.

3 . UNIT III 10

International convention relating to Intellectual Property - Establishment of WIPO - Mission and Activities - History - General Agreement on Trade and Tariff (GATT).

4 . UNIT IV 10

Indian Position Vs WTO and Strategies - Indian IPR legislations - commitments to WTO-Patent Ordinance and the Bill - Draft of a national Intellectual Property Policy - Present against unfair competition.

5 . UNIT V 10

Case Studies on - Patents (Basumati rice, turmeric, Neem, etc.) - Copyright and related rights - Trade Marks - Industrial design and Integrated circuits - Geographic indications - Protection against unfair competition.

Total No of periods: 45

TEXT BOOK

1. Subbaram N.R. " Handbook of Indian Patent Law and Practice ", S. Viswanathan (Printers and Publishers) Pvt. Ltd., 1998.

REFERENCES

- 1. Eli Whitney, United States Patent Number : 72X, Cotton Gin, March 14, 1794.*
- 2. Intellectual Property Today : Volume 8, No. 5, May 2001, [www.iptoday.com].*
- 3. Using the Internet for non-patent prior art searches, Derwent IP Matters, July 2000. [www.ipmatters.net/features/000707_gibbs.html.*

1 . UNIT I 9

Historical Background - Constituent Assembly of India - Philosophical foundations of the Indian Constitution - Preamble - Fundamental Rights - Directive Principles of State Policy - Fundamental Duties - Citizenship - Constitutional Remedies for citizens.

2 . UNIT II 9

Union Government - Structures of the Union Government and Functions - President - Vice President - Prime Minister - Cabinet - Parliament - Supreme Court of India - Judicial Review.

3 . UNIT III 9

State Government - Structure and Functions - Governor - Chief Minister - Cabinet - State Legislature - Judicial System in States - High Courts and other Subordinate Courts

4 . UNIT IV 9

Indian Federal System - Center - State Relations - President's Rule - Constitutional Amendments - Constitutional Functionaries - Assessment of working of the Parliamentary System in India.

5 . UNIT V 9

Society : Nature, Meaning and definition; Indian Social Structure; Caste, Religion, Language in India; Constitutional Remedies for citizens - Political Parties and Pressure Groups; Right of Women, Children and Scheduled Castes and Scheduled Tribes and other Weaker Sections.

Total No of periods: 45

TEXT BOOKS

1. *Durga Das Basu, " Introduction to the Constitution of India ", Prentice Hall of India, New Delhi.*
2. *R.C.Agarwal, " (1997) Indian Political System ", S.Chand and Company, New Delhi.*
3. *Maciver and Page, " Society: An Introduction Analysis ", Mac Milan India Ltd., New Delhi.*
4. *K.L.Sharma, " (1997) Social Stratification in India: Issues and Themes ", Jawaharlal Nehru University, New Delhi.*

REFERENCES

1. *Sharma, Brij Kishore, " Introduction to the Constitution of India:, Prentice Hall of India, New Delhi.*
2. *U.R.Gahai, " (1998) Indian Political System ", New Academic Publishing House, Jalaendhar.*
3. *R.N. Sharma, " Indian Social Problems ", Media Promoters and Publishers Pvt. Ltd.*
4. *Yogendra Singh, " (1997) Social Stratification and Charge in India ", Manohar, New Delhi.*

1 . 9

Introduction to spreading machines and cutting machines - types and functions History of sewing machines and development. Sewing machinery - classification according to bed types, stitch types (hook or looper), material wise (extra light to heavy weight).

2 . 9

Major parts of sewing machinery and functions. Adjustment of major parts of Single needle lock stitch machine: Non-UBT: stand height, pedal, presser foot, height of needle bar, needle to hook relationship, height of feed dog, normal and reverse feed stitch length, feed timing, presser foot pressure, needle and bobbin thread tension, bobbin winding assembly, belt tension. Sewing machine safety regulations.

3 . 9

Sewing needle and sewing thread, thread consumption, thread routing. Adjustment on SNLS UBT: Needle stop position, wiper, thread timing sequence, timing of thread trimmer cam, positioning the moving knife, installation, sharpening, replacing moving knives, adjusting the floating amount of the auxiliary tension disk.

4 . 9

Parts, functions and adjustments of Over lock: Needle height, feed dog height, differential feed ratio, tilt of the feed dog, position of the upper and lower knives, sharpening of knife and loopers, trouble shooting in over lock.

5 . 9

Work-aids and attachments, functions of pullers, guides and folders compensating presser foots- left, right, double; feller, hemmer etc. Collar turning machines, folding machinery, fusing and pressing machinery. Computer controlled cutting, sewing, folding machinery.

Total No of periods: 45

References :

1. *Jacob Solinger., " Apparel Manufacturing Handbook ", VanNostrand Reinhold Company (1980).*
2. *Peyton B .Hudson., " Guide to Apparel Manufacturing ", MEDIAApparel Inc (1989) ISBN: 0 - 945116-08-X.*
3. *Carr.H, Latham. B., " The Technology of Clothing Manufacture ", Blackwell Scientific Publications (1988).*

1 . Introduction to Apparel Industry: 9

Apparel industry in India, Domestic industry, size of the industry, nature of the industry, its developments in recent years. Export industry: Size and nature of the industry.

2 . Fashion: 9

Fashion terminology, Fashion cycle, Fashion industry, factors affecting fashion, Fashion adaptation theories. Major fashion centres of the world: Brief introduction to world fashion centres- American, European, Japanese and Indian; Fashion houses and designers.

3 . Retailing: 9

Various types of retailers, Franchise retailing, private labels and others, department stores, speciality stores, chain retailers, mail order houses, shopping malls. Designer labels Vs Brands, Analysis of designers labels. Licensing and franchising.

4 . Design: 9

Elements and principles of design: Line, colour and proportion emphasis. Design process: Designers' functions - Inspiration files, sketches, how to interpret designs, story Board / Fabric story; The design studio, sampling.

5 . Fashion information services: 9

Trend forecasting and auxiliary services. Forecasting trends: Purpose of forecasting trends, how to use forecasting services. Fashion promotion and communications: Trade fairs, Fashion shows.

Total No of periods: 45

References:

1. Brockman, H.L., " *The theory of Fashion* ", John Wiley & Sons, (1965).
2. Kawashima, Masazki, " *Fundamentals of Men's Fashion Design* ", Fairchild's publications (1976).
3. Carr, H.C., " *The clothing Factory* ", The Clothing Institute, London (1972)
4. Jarnow, J.A., and Judelle B., " *Inside the Fashion Business* ", JWS (1974) 2nd edition.
5. Barton, Roger " *Advertising Handbook* ", Prentice Hall Inc (1956).
6. Swinney, John B, " *Merchandising of Fashion* ", Ronald press (1942).
7. Jacob Solinger., " *Apparel Manufacturing Handbook* ", VanNostrand Reinhold Company (1980).

1 . Basic Pattern making: 9

Measurement taking - size chart and meaning of sizes. Definition of various garment parts and positions. Methods: Bespoke method and industrial method (using blocks) - basic block construction - block preparation and correction.

2 . Dart Manipulation: 10

Pattern making by manipulation of dart - elementary and advanced dart manipulation. Manipulation as seen through existing suppression points (bust points), away from suppression points, as gathers or tucks, as multiple darts. Methods: Slash and spread method, pivot method, difference between permanent pattern (draft) working patterns and production patterns. Importance of drill hole marks in the darts; seam allowances and its importance.

Importance of notches: balance marks and grain lines.

3 . Drafting: 14

Basic principles and methodologies used to draft standard size block patterns for men, women and kids wear - viz., shirts, pants, skirts, blouses, jackets, dresses etc.,

4 . Drafting of sleeve and collar: 7

Construction of sleeve block - crown height and its relationship with the fit of garment. Introduction to Silhouettes of the sleeves. Sleeve variation - cap, regular shirtsleeve, bishop, Leg - O mutton, puff sleeve. Cuffs and sleeve opening, sleeve plackets.

Collars: Set-in collars and collar variations- band collars, Peterpan, sailor, gent's shirt collar - one piece and two-piece collar, convertible collar.

5 . Grading: 5

Principles and technology of grading. Standard size block patterns - grading techniques for half-size and full-size patterns - Computer grading.

Total No of periods: 45

References:

1. Gerry Cooklin., " *Introduction to Clothing Manufacture* ", BSP (1990).
2. Gerry Cooklin., " *Master Patterns and grading for Women's Outsizes* ", BSP (1995)
ISBN: 0-632-03915-9.
3. Gerry Cooklin., " *Master Patterns and grading for Men's Outsizes* ", Blackwell Scientific Publications, (1992).
4. Gillian Holman., " *Pattern Cutting Made Easy* ", BSP (1997), ISBN: 0-7134-8093-9.
5. Natalie Bray., " *More Dress Pattern Designing* ", BSP (1986), ISBN : 0-632-01883-6.

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| 1 . Construction of sample | 9 |
| Basic standard of professional sewing. Relationship between pattern making and the ultimate quality of finished sample. Analysis of component pieces and trimmings - planning a logical garment construction sequence. Planning a layout - Economic use of fabric yardage - maintaining grain lines - Interfacing, Lining. | |
| 2 . Use of SNLS machine | 9 |
| Introduction to needle and their sizes, tread ticket number and their construction. Relation between thread, needle and needle plate. Stitching techniques - sewing problems and their remedies. Construction techniques - cost and time effective methods with respect to men's and women-s wear. | |
| 3 . Introduction and construction techniques of garment closures: | 9 |
| Application of zippers - fly, kissing, lap; Button and buttonholes, hooks and eye snaps, Velcro. Types of seams: Plain seams / pinked seam, stitch and pinked, turn and stitch, flat and fell seam French seam - bias bound, HongKong - Overcoat / Serging. Types of stitches. | |
| 4 . Shaping devices: | 7 |
| Darts, tucks, gathers, pleats. Hemming Techniques: Machine - lock stitch finish, blind stitch finish, hand, with attachments. Necessary fitting adjustments - use of steam pressing equipment during garment construction. | |
| 5 . Types of Plackets: | 11 |
| Regular, top stitched with edge stitch, topstitched with one leg of pressure foot distance, concealed plackets, kurta placket. Sleeve placket: Faced placket, continuous, continuous diamond placket, and diamond placket. Shoulder alignment: patch, concealed. Mounting of sleeve: One piece, two piece. Types of Cuff: square shape, round shape. Types of pockets: Patch pocket, patch with lining / flap, front hip, slant, set-in seam, slash pocket with flap - single lip, double lip, velt pocket. Types of Collars: Mandarin, Convertible, tie, shawl, roll, reverse and notch collar. Waistband finishing: One piece, two-piece and tailor waistband. Elastic application. | |
| Total No of periods: 45 | |

References:

1. Carr .H, Latham .B., " *The Technology of Clothing Manufacture* ", Blackwell Scientific Publications. (1988).
2. Ruth E. Glock , Grace I. Kunz ., " *Apparel Manufacturing - Sewn Product Analysis* " , Blackwell Scientific Publications. (1983).
3. Jacob Solinger., " *Apparel Manufacturing* " , Handbook , VanNostrand Reinhold Company (1980).
4. Peggall.H., " *The Complete Dress Maker* " Marshall Caverdish, London, (1984).
5. Peggall.H., " *Introduction to Dress Making* " , Marshall Caverdish, London, (1985).

1 . INTRODUCTION 9

Control parameters, apparel production parameters, planning and lead-time. Product development: Steps from prototype to production model, Importance of pre-production activities; Introduction to timetable concepts. Product data management: Understanding and interpretation of specification sheet.

2 . OPERATION SEQUENCE DEVELOPMENT 9

Garment breakdown with machine and attachment details, development of production grid for garment construction, development of production flowchart.

3 . BUNDLE TICKETS 9

Guidelines for bundle ticket design, functions of bundle tickets, bundle ticket control. Different manufacturing systems: Make through and Assembly line manufacturing - advantages and disadvantages. Lay lot planning: Numerical exercises on lay lot planning to optimize cutting cost, bundling, ticketing and cutting room control formats.

4 . PRODUCTION PLANNING AND CONTROL 9

Capacity calculation for cutting, sewing and finishing. Determination of machine requirements for new factory. Line balancing: Determination and allocation of manpower and, machine for balanced production in existing plant for a given target.

5 . QUALITY IN PRODUCT DEVELOPMENT 9

Quality assurance during product development - methods to avoid problems during pattern making, garment construction and other areas. Inspection procedures. Work-study in garment industry - methods to control time and cost.

Total No of periods: 45

References :

1. *A.J. Chuter., " Introduction to Clothing Production Management ", Blackwell Scientific Publications*
2. *David J. Tyler., " Materials Management in Clothing Production ", Blackwell Scientific Publications Professional Books.*

GT039 Fabric and Garment Finishing**3 0 0 100****1 . GARMENT DEYING****10**

Fabric and sewing thread selection, accessories selection, dye selection, garment-dyeing machinery.

2 . WASHING**10**

Stone washing, acid washing, enzyme washing, bio polishing, emerisation, bleaching, laser fading and ozone fading.

3 . FINISHING**20**

Optical brightening, mercerisation, liquid ammonia treatment, stiffening, softening, crease resistant and crease retentive finish, anti-static finish, anti-bacterial finish, water proofing, flame proofing, soil release finish, mildew and moth proofing.

4 .**5**

Stain removal, care labels, laundering equipment and procedures.

Total No of periods: 45*References :*

1. Harrison.P (Editor), " Garment Dyeing: Ready to wear fashion from the dye house", The Textile Institute, U.K (1988) ISBN: 1870812131.
2. Noemia D, souza ., " Fabric Care" , New Age International (P) Ltd Publisher, Chennai ,1998, ISBN: 81-224-1143-6.
3. Hall , A.J., " Textile Finishing ", Elsevier Publishing Co. Ltd., 1986.
4. Marsh, J.T., " An Introduction to Textile Finishing ", Chapman and Hall Ltd., London, 1979.
5. Shenai, V.A., " Technology of Textile Finishing " , Sevak Publications, Bombay, 1995.

1 . Organization of the Apparel Business 6

Introduction to apparel industry - organization of the apparel industry types of exporters Business concepts applied to the apparel industry - International trade.

2 . Marketing 9

Functional organization of an apparel firm. Responsibilities of a marketing division - marketing objectives and strategies - Marketing research - Types of markets: Retails and wholesale strategies for merchandise distribution - retailers - sourcing flows and practices. Marketing plan. Labeling and licensing.

3 . Merchandising 10

Definition of merchandising - functions of merchandising division - Role and responsibilities of a merchandiser - different types of buyers -Communications with the buyers - awareness of current market trends - product development - line planning line presentation.

4 . Sourcing 10

Need for sourcing - sourcing materials - manufacturing resources planning - principles of MRP - Overseas sourcing - sourcing strategies.

Supply chain and demand chain analysis - Materials management for quick response - JIT technology.

5 . Documentation 10

Order confirmation, various types of export documents, Pre-shipment Post -shipment documentation, Terms of sale, payment, shipment etc.

Export incentives: Duty drawback, DEPB, I / E license - exchange control regulation - foreign exchange regulation acts - export management risk - export finance. WTO / GATT / MFA - Functions and objectives, successes and failures.

Total No of periods: 45

References:

1. *D. Sinha., - " Export Planning and Promotion ", - IIMS, Calcutta (1989).*
2. *Tuhin K. Nandi., - " Import - Export Finance ", - IIMS, Calcutta (1989).*
3. *Elaine Stone, Jean A. Samples., - " Fashion Merchandising ", McGraw Hill Book Company (1985) ISBN: 0 - 07 - 061742 - 2.*
4. *S. Shivaramu., - " Export Marketing - A practical guide to Exporters ", Wheeler Publishing (1996) ISBN: 81-7544-166-6.*
5. *J.A. Jarnow, M.Guerreiro, B.Judelle., - " Inside the Fashion Business " , Macmillan Publishing Company (1987) ISBN: 0-02-360000-4.*

1 . Introduction to computer 9

Introduction to computer - concepts of CAD / CAM. CAM in Garment Manufacturing. Complete pattern design system in preparation for grading, marker making and pattern manipulation.

2 . Computerized production pattern making 9

Computerized production pattern making - Hardware, software and system programming to produce a sample production pattern. Computer aided manipulation of pattern pieces to create individual styles. Operation of garment CAD software. Computer used for purchase, inventory control and sales, computerization in quality control and production control.

3 . Computer aided production planning in Garment Manufacturing. 12

Introduction to finite scheduling concept and fast react software. Creating product and order planning, updating. Eliminate late deliveries - General set up, allowances and matrices - Analyzing loan balancing in different departments - control mechanisms - critical path and time tables.

4 . Cam 9

Computer controlled machinery for garment manufacturing - automated layout planning by various techniques - Algorithm for computer production garment parts - intelligent systems - 3D scanning technology. Use of microcomputers for production control in garment industry. Imaging techniques for various designs. Development of robotics for CAM.

5 . Management Information System in garments Industry 6

EDI in garment technology. Concept of Enterprise Resource Planning (ERP) and computerization in exports / documentation.

Total No of periods: 45

References:

1. *Stephen Gray " CAD / CAM in clothing and Textiles ", Gower Publishing Limited, 1998, ISBN 0-566-07673X.*
2. *Compilation of papers presented at the Annual world conference Sep 26 -29, 1984 Hongkong, " Computers in the world of textiles ", The textile Institute ISBN: 0-0900739-69X.*
3. *W.Aldrich, " CAD in clothing and Textiles ", Blackwell Science 2nd edition, 1992, ISBN: 0-63 -3893 - 4*
4. *Jacob Solinger, " Apparel Manufacturing Handbooks ", Van no strand and Reinhold Company, 1980,ISBN:0-442-21904-0.*

1 . Linear Programming 10

Formulation of LP problem; Solution of LP problem by graphical method, simplex method.

2 . Transportation problem 11

Northwest corner rule, inspection method, Vogle Approximation method. Application of optimality test. Inventory Control: ABC analysis, Fixation of inventory level, EOQ (Wilson's Formula), Problems related to above theoretical aspects.

3 . PERT / CPM 12

Drawing of CPM and PERT networks, finding critical path Project cost control, determining the value of z-variate in the case of PERT networks, S. D, variances etc.

4 . Game theory 12

Rule of Saddle point determination, Rule of dominance, Mixed strategy approach, Graphical Approach, Problems related to above theoretical aspects.

Total No of periods: 45

References:

1. J. Heizer, B.Render., " Production and Operations Management ", Prentice Hall (1993)
ISBN: 0-205-14048-3.
2. Hamdy A. Taha, " Operations Research an introduction ", Maxmillan Publishing Company,
New york, Third Edition, 1982.
3. Hamdy A. Taha, " An introduction to Operations Research ", Maxmillan Publishing Company,
New york, Fifth Edition, 1996.
4. Narayan Bhat U, " Elements of Applied Stochastic processes ", John Wiley and Sons, 1972.
5. Fredrick S. Hiller and Gerald J Liberman, " Introduction to Operations Research ", McGraw-Hill,
Industrial Engineering Series, International edition, 1995.

1 . Product analysis 6

Relationship between quality and construction of a sewn product geometric principles of draping, drafting and industrial patterns product specifications.

2 . Production control and Engineering 8

Industrial engineering concepts - Development and application of standard data for pre-costing and factory scheduling - Basic production systems - production control charts. Manufacturing Information system: Systems and procedures.

3 . Production Management analysis 10

Analysis of techniques for material utilization and cutting of raw materials for all types of sewn products principles and methods of costing, evaluation of equipment for examining, spreading, cutting, marking and ticketing - solution of production problems in spreading, cutting and cost control.

4 . Plant Layout 11

Definition - Types of production layout, criteria for evaluation of a plant layout, determining minimum space requirement, calculation grid, plant size location, Basic production line layout, Government regulations for plant layout.

5 . Time and motion study 10

General approach for making a time and motion study, preliminary data for time and motion study sheet; sewing work study, Principles of work cycle timing methods, objectives of time study, statistical approaches - statistical calculation of time study- operator efficiency distributions. Evaluating motion study data - Principles for improving sewing and pressing operations.

Total No of periods: 45

References :

1. *Jacob Solinger., " Apparel Manufacturing Handbook ", VanNostrand Reinhold Company (1980).*
2. *Bethel , Tann , Atwater and Rung., " Production Control ", McGraw Hill Book Co., New York, (1948).*
3. *Biegel , John. E., " Production Control ", A Quantitative Approach " Prentice Hall Inc., (1971) 2nd edition.*
4. *Apple. J. M., " Plant Layout and Materials Handling ", The Ronald Press Co., New York (1950).*
5. *Immer , John. R., " Layout Planning Techniques ", McGraw Hill, New York, (1950).*
6. *Barnes, Ralph M., " Motion and Time Study ", John Wiley and Sons., New York., (1958) 4 th edition.*

1 . INTRODUCTION 5

Special and comparative features of German with English, Hindi and Tamil - German Alphabets, pronunciation.

2 . THEMA 10

Name, Land Wohnort - Studium, Beruf - Familie, Geschwister, Alter - Tagesablauf , termine - Einladung - Stellensuche, Berufswahl - Einkauf.

3 . GRAMMATIK 10

Personalpronomen, Verb, Wortstellung, Ort - Possessivpronomen, Verb - 'Sein' - Verb - 'Haben', Unbestimmter Artikel, Negation - 'Nicht' - 'Kein' - Zeit, Bestimmter Artikel, Starke Verben - Trennbare Verben, Imperativ - Modal Verben - Akkusativ.

4 . UEBUNGEN 10

Partner uebungen - Schriftliche Uebungen - Aussprache Uebungen - Kontrollue bungen - Text generation.

5 . DIALOGUE 5

Oral - Written.

6 . GLOSSARY 5

Technical Words.

7 . TUTORIAL 15**Total No of periods: 60**

Text Book:

1. LERNZIEL DEUTSCH (Deutsch als Fremdsprache) - Grundstufe 1 from Max Hueber varlag.

Text Book:

1. LERNZIEL DEUTSCH (Deutsch als Fremdsprache) - Grundstufe 1 from MAX Hueber Verlag.

1 . 9

Introduction to Japanese Alphabets - Hiragana, Katakana and Kanji - group 1,2,3 & 4 Syllabus - Writing Practice - Pronunciation - word Order - Greetings - Receiving a visitor and exchange of pleasantries - Kanji Practice.

2 . 9

Basic structure of sentences - classification of verbs - Polite form of verbs - irregular verbs - Particle-E - Time expressions - question sentences - Japanese numerals - Kanji practice.

3 . 9

Classification of particles - Ga, Ka, Wa, O, E, Ni etc - aural comprehension - reading comprehension - noun -1 Wa, noun -2 desu - Demonstrative pronouns - kore, sore , are and dore - kono, sono, ano and dono - kochira - sochira - achira and dochira - particle - No, kara, ni and de - question - itsu - conversational grammar - soo desu ka - Na, I adjectives perfect and imperfect - question words - Doo and ikaga - particle - To, ne and yo - Kanji practice.

4 . 9

Desu as a substitute for a verb - demonstrative pronouns sono and sore - Group 1 particles - de, O, Made and Ka - conjunction - soshite - Question words - dare, nani, doko, itsu, dore, dochira, doyatte, ikutsu, ikura - Words for degrees - gurai or kurai - Phrase - Saa - anoo - numerals - counters and numbers - humble form of desu and arimasu - Kanji practice.

5 . 9

Verbs ending in-te or de - classification of Te forms and Masu forms - verb modifiers - koo, soo, aa and doo - Set phrase - Onegaishimasu - Sumimasen - Adverbs - Mazu, sore kara and saigo ni - formation of the Te form of I adjective and desu - kanji practice.

Total No of periods: 45

Text Books:

1. *OOTSUBO et al - " A Course in Modern Japanese ", Vol.1, 1983, The University of Nagoya Press, Japan.*
2. *SHIYO SUZUKI and IKUO KAWASE - Nihongo Shoho text book with audio tapes, 1981.*
3. *YAN - SAN Serial - Video tapes, Japan.*

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| 1 . | 9 |
| Demonstrative Pronouns: Are - Interjection: Ee - Quoted Sentences - omoimsu - Non polite form of verbs - Group 1 ending in -ert or iru, group 2 verbs ending in - u - Non polite forms of - I - adjectives -non polite form of desu,deshoo,daroo - Suffic - Sugiru - expression of reason - tame (ni) - Counters: - Hon and - Do - Kanji practice. | |
| 2 . | 9 |
| Negative - Te - form of verbs -I adjectives - Permission and prohibition - te mo desuka and - te wa ikemasen ka - Na - adjectives - suki and kirai - Verbs:Itadaku - Conjunction - Nagara - Phrase - No koto na n desu ga - usage of chotto - kanji practice. | |
| 3 . | 9 |
| Noun modifiers - Quoting modifier - Suffix - Kata - sa and me - Particles - Made ni and dake - te form of verb and iru/imasu - noun - Uchi - Eba form of verbs - Kanji practice. | |
| 4 . | 9 |
| Potential sentences - group 1 verbs - group 2 verbs irregular verbs - Nouns - Tsumori and Hazu - Adverbs: Moo and Made - Form of address: moshomoshi - Expression - Ee - verbs: Naru and suru - Particles - De and ka - kanji practice. | |
| 5 . | 9 |
| Comparative sentences - no hoo ga and yori - Negative comparative sentences - Negative request - Adverbs of extent - Konna ni, sonna ni and anna ni - Te form of transitive verb and - arul - Passive sentence - neutral passive sentence - technical vocabulary related to Engineering and Technology - Preparation of technical reports. | |
| 6 . TUTORIALS | 15 |

Total No of periods: 60

Text Books:

1. *OOTSUBO ET AL - " A Course in Modern Japanese ", Vol.II, The University of Nagoya Press, Japan, 1983.*
2. *SHIYO SUZUKI and IKUO KAWASE - Nihongo Shoho text book with audio tapes, The Japan Foundation, Tokyo, Japan, 1981.*
3. *YAN - SAN Serial - Video tapes, Japan.*

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| 1 . | 9 |
| Alphabets - Pronunciation - Masculine and Feminine Genders only - Numbers - Indefinite and definite articles - plurals - Verbs to be and to have. | |
| 2 . | 9 |
| Present tense - Affirmative, interrogative and negative sentences - Adjectives - Adverbs - Prepositions - Possessive Pronoun - Personnel Pronoun - Indirect Object. | |
| 3 . | 9 |
| Group I verbs - Conjugations - Present, Past compound, Simple past and future tenses - Singular & Plural - Masculine and Feminine - adjectives and adverbs. | |
| 4 . | 9 |
| Group II Verbs - Conjugations- Present, Past compound, simple past and future tenses - Singular and Plural - Masculine and Feminine - adjectives and adverbs. | |
| 5 . | 9 |
| Pronomial verbs - Present, Past compound, Simple past and future tenses - Singular and Plural - Masculine and Feminine - adjectives - adverbs - Dialogue - Glossary. | |
| 6 . TUTORIAL | 15 |

Total No of periods: 60

Text Books:

1. MAUGER. G - *Course de Langue et de - Civilization Francaises*, HACHETTE -PARIS, 1986.
2. DOMINIQUE BERGER and REGINE MIRIEUX, *Cadences, Method de Francais Didier*, Paris, 1994.

References:

1. DENIS GIRARD, *French to English, English to French Dictionary*, Cassell - Mac Millan, 1981.

HS040 Technical French II**3 1 0 100**

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| 1 . | 9 |
| Group III Verbs - Conjugations - Adjectives - Adverbs - sentences - present - past compound - Simple past - future. | |
| 2 . | 9 |
| Comparative, superlative sentences - recent past - immediate future - grammatical analysis. | |
| 3 . | 9 |
| Translation from English to French - Translation from French to English - Texts from Physics and Chemistry. | |
| 4 . | 9 |
| Translation from English to French - Translation from French to English - Texts from Basic Engineering. | |
| 5 . | 9 |
| Report writing and translation from English to French - Translation from French to English - Letter Writing - Dialogue - Glossary. | |
| 6 . TUTORIALS | 15 |

Total No of periods: 60

Text Books:

1. MAUGER, G - *Cours de Langue et de - Civilization Francaises*, HACHETTE - PARIS, 1986.
2. DOMINIQUE BERGER and REGINE MIRIEUX, *Cadences Methods de Francais*, Didier, Paris, 1994.

References:

1. CENTRE D'ETUDES FRANCAISES, " *Functional French for Scientists and Technologists* ", Jawaharlal Nehru University, New Delhi, 1986.
2. J.O.KETTRIDGE " *Dictionary of Technical terms and phrases Vol 1 & 2* ", The Gresham Press, Surrey, Great Britain, 1980.

1 . LISTENING 7

Listening comprehension-listening for specific information-note-taking-use of charts and diagrams.

2 . SPEAKING 7

Defining-describing objects-describing uses/functions-comparing-offering suggestions-analysing problems and providing solutions-expressing opinions (agreement/disagreement) predicting-expressing possibility/certainty-framing questions-providing answers-pronunciation practice (word stress).

3 . READING 12

Skimming-scanning-detailed reading-predicting content-interpreting charts and tables-identifying stylistic features in texts - evaluating texts-understanding discourse coherence-guessing meaning from the context- note - making / transferring information.

4 . WRITING 12

Sentence definition-static description-comparison and contrast-classification of information-recommendations-highlighting problems and providing solutions-formal and informal letter writing-using flow-charts/diagrams-paragraph writing-editing.

5 . FOCUS ON LANGUAGE 7

Word formation with prefixes and suffixes-discourse markers and their functions-degrees of comparison-expressions relating to recommendations and comparisons-active and passive voice-antonyms-tense forms-gerunds-conditional sentences-modal verbs of probability and improbability-acronyms and abbreviations - compound nouns and adjectives-spelling-punctuation.

6 . PRACTICE IN LANGUAGE LAB 15

Pronunciation practice - word stress - sentence stress - Listening comprehension - discussion - interpretation of visuals.

Total No of periods: 60

Text Books:

1. "*English for Engineers and Technologists* ", Volume I. Authors : *Humanities and Social Science Department, Anna University, Published by Orient Longman Ltd., 1990.*

References:

1. *Narayanaswami, V.R. Strengthen Your Writing, Orient Longman Ltd., Chennai 1996 (Revised Edition)*
2. *Pickett and Laster, Technical English, Writing, Reading and Speaking, New York Harper and Row Publications.*
3. *Swan, Michael, Basic English Usage, Oxford University Press, 1984.*

1 . LISTENING 7

Listening comprehension - listening for specific information - note-taking and using non-verbal devices.

2 . SPEAKING 7

Describing processes-stating purpose-offering opinions, suggestions and recommendations-summarizing-reporting-free discussion of chosen topics-pronunciation practice (word stress, consonant clusters-homonyms)

3 . READING 12

Skimming-scanning-note -making-understanding the organisation of texts discourse cohesion-predicting and evaluating content-evaluating style-inferring meaning-study reading-interpreting tables, flow-charts.

4 . WRITING 12

Extended definition-process description-cause and effect analysis-stating choice and justifying it -safety instructions-check list-letter of application-data sheet/resume.

5 . FOCUS ON LANGUAGE 7

Word formation-synonyms-prepositions-adverbs-passive voice-sequence words/discourse markers-connective adverbs-numerical expressions-expansion of abbreviations-rules for writing SI units-language of instructions, check-lists, causes and effects, purpose and means-indefinite adjectives of number and quantity-spelling and punctuation.

6 . PRACTICE IN LANGUAGE LABORATORY

Pronunciation practice - listening comprehension - discussion - interpreting and reporting from visual inputs.

7 . TUTORIAL 15**Total No of periods: 60**

Text Books:

1. *" English for Engineers and Technologists ", Volume II, AUTHORS :Humanities and Social Science Department, Anna University, Published by Orient Longman Ltd.,1990.*

References:

1. *Swales, John.M. and Christine B Feak, "Academic Writing for graduates students", The University of Michigan Press, USA, 1994.*
2. *Goddard, Ken - " Informative Writing - Your Practical Guide to Effective Communication ", Cassell Publication U.K. 1998.*
3. *Cutts, Martin " The Plain English guide-How to write clearly and Communicate Better ", Oxford University Press, New Delhi, 1995.*

1 . UNIT I 22

ORAL COMMUNICATION - Practical use of language in simulated real - life situations through role playing - social skills - interaction with employers, peers and subordinates - Group dynamics - Listening techniques - Phonological aspects of language use - pronunciation, stress and intonation.

Introducing oneself and others, narrating events - Making telephonic conversation - Making requests, Asking questions, Making recommendations using modal verbs, Expressing causal relations with suitable discourse markers, Giving instructions using imperatives, Expressing purposes and functions, obligation and preferences, Accepting offers and Counselling, Interpreting advertisements, Describing processes using sequential expressions. (Lecture:8, Practicals 14)

2 . UNIT II 12

Presenting one's ideas at meetings and conferences, Making extempore talks, Public speaking, Body language, Strategic competence, Use of audio - visual aids and multimedia presentations. (Lecture : 6, Practical 6)

3 . UNIT III 8

Technical Writing - the structure of organised writing - paragraph writing, coherence, cohesion (use of Discourse Markers) and punctuation, Use of titles, nonverbal devices - Layout - Revision strategies - Reading techniques.

Letter Writing: - Personal/Informal letters: Letters to family members and friends Business / Formal letters: Letters thanking the recipients, announcing functions, extending invitations, congratulating associates on important occasions, letters of application (Resumes), apology and complaint, letters to the editor. (Lecture:8, Practical : 0)

4 . UNIT IV 8

Report Writing: - persuasive, explanatory, argumentative and informative, Writing agenda, minutes, memos, project proposals and checklists.

(Lecture : 8, Practical 0)

5 . UNIT V 10

Grammar - study of grammatical items in contexts. Nouns, pronouns, adjectives, comparative adjectives, adverbs, gerund, prepositions, voice, tenses, 'if clauses, direct and indirect speech (reporting verbs), concord Vocabulary - Synonyms, antonyms, homonyms, homophones, hyponyms, affixes, reference words, phrasal verbs and prepositional phrases. (Lecture:10, Practical : 0)

Total No of periods: 60

Text Books:

1. *Doff, Adrian and Jones, Christopher, Language in Use: Classroom Book (Intermediate level). Cambridge: CUP. 1994 (2 audio cassettes).*
2. *Dr.V.Chellammal, Learning to Communicate - a resource book for Engineers and Technologists. Coimbatore: Kamakhya Publications 2002 (1 audio cassette)*

References:

1. *Sung, Abraham. 330 more Model Letters for all occasions Malaysia-Minerva Publications. 2002.*
2. *Bentley, T.J. Report Writing in Business: The Effective Communication of Information. New Delhi: Viva Books Pvt.Ltd., 2001*
3. *Vivanilam, J.V. More Effective Communication: A Manual for Professionals. New Delhi: Response Books. 2000*
4. *Michael, V.P.Communication and Research for Management. Mumbai: Himalaya Publishing House 2001.*
5. *Nauheim, Ferd. How to Write Business Letters. New Delhi; Crest Publishing House 2000.*
6. *Mohan, Krishna, Meera Banerji. Developing Communication Skills. New Delhi: Macmillan 1991.*
7. *Denny, Richard. Communicate to Win. New Delhi: Kogan Page 2002.*

TT034 Fibre and Textile Composites

3 0 0 100

1 . 9

Origins of development -Resins-Additives to Resins-Reinforcements-Properties of composite materials-
Comparison of structural materials

2 . 9

Techniques for manufacturing composites-open mould-closed mould and continuous processes-3D structures-fiber
volume fraction.

3 . 9

Anisotropy of stress elasticity-thermal conductivity

4 . 9

Quality control in composites-material-preparing-mould-operating control in manufacturing-control of finished
products.

5 . 9

Manufacture of high performance fibres.

Total No of periods: 45

Reference :

1. Pipes, R.B., *Composite Material Series, Vol, 1 to 3, Elsevier, 1986.*
2. Ken Ashbee, *Fundamental principles of fibre reinforced composites. Technomic Publishing Co., Inc., Pennsylvania, USA, 1989.*
3. Leonard Hollaway, *Handbook of Polymer composite for Engineers, Woodhead Publishing Ltd., Cambridge, England, 1994.*
4. Geier, M.H., *Quality Handbook for Composite Materials, Chapman and Hall, London, U.K., 1994.*
5. Gill, R.M., *Carbon fibres in composite materials, Butterworth Group, 1992.*
6. De.S.K and White, J.R., *Short fibre polymer composites Wood head, Manchester, 1996, ISBN:1855732203*

| | |
|--|--------------------------------|
| 1 . | 5 |
| Need for bulking of synthetic fibres-texturing - basic definition and classifications - Development in high speed spinning - poy. | |
| 2 . | 8 |
| Heat setting - need-factors involved-types of setting - effects on fibre morphology and mechanical properties-fundamentals of thermo-mechanical texturing-Helanca process. | |
| 3 . | 20 |
| Basics of false-twist texturing-texturability of various fibres-process parameters-time, temperature, twist, tension-suitability of poy and udy for FT texturing - Draw texturing - simultaneous and sequential draw texturing - twisting devices-testing of textured yarns. | |
| 4 . | 7 |
| Basics of air jet texturing - types of yarns produced - feed material structure and properties of air-jet texturing machines, nozzles, evaluation of air-jet textured yarn Vs spun, and filament false twist textured yarns. | |
| 5 . | 5 |
| Stuffer box and edge crimping methods-principles, limitations, and applications-knit-de-knit and gear crimping methods. Bicomponent filament texturing - texturing of polypropylene and jute fibres - Chemo - mechanical and thermo-mechanical texturing. | |
| | Total No of periods: 45 |

Text Books:

1. *Hes L. Ursiny P, " Yarn Texturing Technology ", Eurotex, U.K. 1994.*
2. *Behery H.M and Demir A., " Synthetic filament yarn texturing technology ", Prentice Hall, 1996, ISBN 0134400259.*

References:

1. *Annual symposium of texturing: Edited by M.L Guirajani, I.I.T Delhi-1977 Wilson D.K and Kollu T., " Production of textured yarns by the false twist technique ", Textile progress Vol 21, No.3 Textile Institute, Manchester U.K 1991.*
2. *Winter school on Man-made fibers-production, processing, structure, properties and applications Vol 1, 1988 Edited by V.B. Guptha.*
3. *Wilson D.K. Kollu T, " Production of textured yarns by methods other than false twist technique ", TP Vol 16, No.3. Textile Institute 1981.*
4. *Workshop on Texturisation Books of papers Anna University Textile dept. Dec' 81.*
5. *Synthetic Yarn Production, By Demir & H ei-BEHERY Prentice Hall Inc 1996.*

1 . FIBRE INDIVIDUALIZATION 8

The necessity of fibre individualization in the fibre opening processes; effect of fibre-group size on yarn uniformity; minimum requirements to achieve fibre individualization; basic approach for fibre individualization in the opening machines.

2 . PRINCIPLE OF FIBRE OPENING IN BLOWROOM 12

The principle of fibre opening in the blowroom machines; calculation of tuft size reduction in openers based on machine and processing parameters; limitation of fibre opening in blowroom machinery; control tuft size variation and fibre rupture during opening.

3 . ROLE OF CARDING MACHINE 12

The function of licker-in-in-card; degree of opening in licker-in ; the mechanics of fibre opening in the carding area; study of effect of fundamental factors like wire point design and density, speeds; setting and transfer coefficient on fibre individualization; calculation of useful parameters to assess the carding performance; card grinding on carding efficiency.

4 . CARDING PRODUCTIVITY 8

Relationship between carding productivity and degree of fibre individualization; limiting factors of carding productivity; new concepts to improve carding productivity.

5 . CLEANING 5

Role of fibre opening on fibre cleaning; the factors affecting fibre cleaning in the blowroom and carding machines; control of air suction for efficient cleaning.

Total No of periods: 45

Reference :

1. Klein W, *A Practical Guide to Opening and Carding, The Textile Institute, Manchester, 1999.*
2. Grosberg P and Iype C, *Yarn Production: Theoretical Aspects, The Textile Institute, Manchester, 1999.*
3. Salhotra K.R., and Chattopadhyay, R., *Book of papers on Blowroom and Card. Indian Institute of Technology, Delhi, 1998.*
4. Lord P.R., *Yarn Production; Science, Technology and Economics , The Textile Institute, Manchester, 1999.*

1 . IDEAL DRAFTING 6

Defintion of ideal drafting; conditions required to achieve ideal drafting in a roller drafting system; deviations from ideal drafting situation duration actual drafting conditions.

2 . DRAFTING WAVE 12

Defintion of drafting wave; condition for drafting wave formation during roller drafting ; estimation of the magnitude of the irregularity caused by the occurence of the drafting wave; forces acting on a fibre during drafting at different positions in a drafting zone; methods to avoid drafting wave formation ; role of apron in controlling drafting wave formation.

3 . ROLLER SLIP 10

Definition of roller slip; conditions for the formation of forward and backward slips in the roller drafting systems; measures to avoid roller slip occurrence.

4 . OTHER DRAFTING IRREGULARITIES 7

The causes for roller nip movement and roller speed variation during drafting and their effect on products irregularity; control of the irregularity formed from these sources.

5 . COMPARISON 10

Camparison of roller drafting system with wire point drafting system application of wire point drafting in card and rotor spinning machine; comparison of roller drafting in drawframe, comber preparatory, comber speedframe, ringframe, ringcan spinning, condensed yarn spinning and in air-jet spinning machine; influence of draft on spinning triangle size and the subsequent effect on machine performance and product quality.

Total No of periods: 45

Reference :

1. *Foster G.A.R, The Principles of Roller Drafting and the Irregularity of Drafted Materials, The Textile Institute, Manchester, 1958.*
2. *Klein W. A Practical Guide to Combing, Drawing and the Roving Frame, The Textile Institute, Manchester, 1999.*
- 3 *Lord P.R., Roller Drafting, Textile Progress, The Textile Institute, Manchester, 1993.*
4. *Groberg P and Iype C. Yarn Production: Theoretical Aspects, The Textile Institute, Manchester, 1999.*
5. *Lord P.R., Yarn Production; Science, Technology and Economics, The Textile Institute, Manchester, 1999.*

1 . FUNDAMENTALS OF TWISTING 8

Mechanics of imparting strength to a staple-fibre strand by twisting meaning of twist multiplier and the basis of selection of required twist; principles of false twisting; fundamental requirements to create real twist in the strand.

2 . TWISTING IN RING SPINNING 10

Principle of twist insertion in ring spinning; limitation of ring twisting; mechanics of balloon formed during twisting; influence of twisting on spinning triangle size and the subsequent effect on yarn quality and spinning performance. design features of rings and travellers used for twisting different types of yarns.

3 . TWISTING IN OPEN-END SPINNING 10

Principle of twist insertion in open-end spinning; application of this principle in rotor spinning and friction spinning machines; advantages of this method of twisting over ring twisting method; comparison of yarn tension developed during twisting in these two machines.

4 . TWISTING IN AIR-JET SPINNING 7

Principle of twist formation in air-jet spinning; advantage of using two air nozzles; the merits and demerits of this method of twisting; application of this method of twisting in PLYfil yarn production.

5 . TWO-FOR-ONE TWISTING 5

Principle of two-for-one twisting; the advantages of this method of twisting working of two for one twister.

6 . OTHER TWISTING METHODS 5

Twisting of yarns in double-rove fed spinning machines; operating principle involved in the twisting of wrap-spun yarns; technological and economic interrelationships in these methods of twisting; role of twisting in fancy yarn production.

Total No of periods: 45

Reference :

1. *De Barr A.E and Catling H., "The Principle and Theory of Ring Spinning , The Textile Institute, Manchester, 1965.*
2. *Usenko V., Processing of Man-made Fibres, Mir Publishers, Moscow, 1979.*
3. *Klein W., New Spinning Systems, The Textile Institute, Manchester, 1993.*
4. *Grosberg P and Iype C. Yarn Production; Theoretical Aspects, The Textile Institute, Manchester, 1999.*
5. *Lord P.R., Yarn Production: Science, Technology and Economics, The Textile Institute, Manchester, 1999.*

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| 1 . FIBRE CLEANING AND BLENDING | 7 |
| Impurities in the long-stable fibre like wool and their removal; methods adopted to process raw flax and jute; blending methods followed for long stable fibres. | |
| 2 . FIBRE INDIVIDUALISATION | 8 |
| Fibre individualisation in the carding machine; working principle and details of different type of carding machine-worsted carding, semi -worsted carding, wollen carding, flax carding and jute carding ; card clothing and its maintenance; carding performance. | |
| 3 . COMBING | 8 |
| Objective of combing; basic principles of combing; details of wool combing preparation and combing operation; worsted top finishing. | |
| 4 . DRAWING | 7 |
| Principle of long-stable drafting; effect of doubling; drafting irregularities; working details of worsted, semi-worsted, jute and flax drawing; operating principle of roving machine. | |
| 5 . YARN SPINNING | 15 |
| Mule spinning-drafting, twisting, backing-off, winding on; description of centrifugal spinning; Flyer spinning , Ring spinning twisting , rings and travellers; condenser yarn spinning cap spinning; open end spinning -general features of rotor and friction spinning as applicable to long-stable fibres; Self twist spinning system. | |
| Total No of periods: | 45 |

Reference :

1. *Oxtoby E, Spun Yarn Technology, Butterworths, London, 1987.*
2. *Happey F., Contemporary Textile Engineering, Academic Press, London, 1983.*
3. *Lord P.R., Yarn Production: Science, Technology and Economics, The Textile Institute, Manchester, 1999.*
4. *Ross D.A., Carnaby G.A and Lappage J., Woollen Yarn Manufacture, Textile Progress, The Textile Institute, Manchester, 1986.*
5. *Richards R.T.D and Sykes A.B., Wollen Yarn Manufacture, The Textile Institute, Manchester, 1994.*
6. *Henshaw D.E., Worsted Spinning, Textile Progress, The Textile Institute, Manchester, 1981.*

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|--|-----------|
| 1 . YARN GEOMETRY | 14 |
| The idealized helical yarn structure; yarn count and twist factors; twist contraction, packing of fibres in yarns; measurement of yarn diameter; ideal migration; tracer fibre technique; characterisation of migration behaviour; migration in blended yarns; mechanisms of migration; effect of various parameters on migration behaviour. | |
| 2 . MECHANICS OF CONTINUOUS FILAMENT YARNS | 8 |
| Analysis of tensile behaviour; prediction of breakage; analysis of yarn mechanics by energy method; observed extension and breakage of continuous filament yarns; mechanics of torque in filament yarns. | |
| 3 . MECHANICS OF STAPLE FIBRE YARNS | 6 |
| Theoretical analysis; fibre obliquity and slippage ; influence of fibre length, fineness and friction ; strength of blended yarns-Hamburger's model. | |
| 4 . WOVEN FABRIC GEOMETRY AND DEFORMATION | 12 |
| Elements of woven fabric geometry; Pierce and Olofsson models jamming of threads; cover factor; crimp interchange in woven fabrics; modification to Piece model-race track, saw tooth and bilinear models, form factor; degree of set; extension behaviour of woven fabric; prediction of modulus; tensile properties in bias direction; other fabric deformation-shear, buckling, bending and compression; fabric handle; use of finite element analysis. | |
| 5 . NONWOVENS AND KNITTED STRUCTURES | 5 |
| Geometry of plain knitted structure; mechanics of nonwoven fabrics | |

Total No of periods: 45

Reference :

1. *Hearle J.W.S., Grosberg P and Backer S., Structural Mechanics of Fibres, Yarns and Fabrics, Wiley-Interscience, New York, 1969.*
2. *Goswami B.C., Martindale J and Scandio, Textile Yarns Technology, Structure and Application, Wiley Interscience New york, 1977.*
3. *Hearle J.W.S., Thwaites J.J and Amirbayat, Mechanics of Flexible Fibre Assemblies, Marryland, 1980.*
4. *Postle R., De Jong S and Carnaby G.A., The Mechanics of Wool Structures, Ellis Horwood, 1988.*

TT042 Mechanics of Textile Machinery**3 0 0 100****1 . MACHINE DESIGN 9**

Design of cams, gear trains, clutches and brakes. Practical application in textile machines.

2 . ROTARY MOTION 10

Equations of rotary motion. Power transmitted by rope and belt drives. Energy stored in rotating masses. Balancing of rotating masses.

3 . SPINNING MACHINES 12

Auto levellers, differentials and variable speed drives, traveller and balloon dynamics, design of machine components.

4 . PREPARATORY MACHINES 2

Yarn winding calculation.

5 . WEAVING MACHINES 12

Kinematics of shedding, picking and beat up. Let off and take up mechanisms.

Total No of periods: 45

Reference :

- 1.Booth, J.E., Textile Mathematics, Vol.1,2&3, The Textile Institute, Manchester, 1987.*
- 2.Slater, K., Textile Mechanics, Vol.1 & 2. The Textile Institute, Manchester, 1987.*

TT043 Process Control in Weaving

3 0 0 100

1 . INTRODUCTION 3

Scope of process control in weaving and preparation to weaving.

2 . WINDING 10

Quality of joints. Fault removal. Winding performance. Productivity. Maintenance, Quality control, Material handling.

3 . WARPING 5

End breaks, Quality of warpers beam, hard waste, Norms, Productivity, Maintenance, Quality control, Material handling, Beam count.

4 . SIZING 12

Choice of size recipe and pick up, Size preparation and storage. Control of size pick up, yarn stretch and moisture. Quality of sized beam. Dead loss. Hard waste. Norms. Productivity. Maintenance. Quality Control. Material Handling. Migration, Missing ends.

5 . DRAWING-IN & KNOTTING 3

Selection and care of reeds, healds and drop pins. Control of cross ends and extra ends.

6 . WEAVING 12

Control of loom speed efficiency, Stops, Hard waste, Norms, Productivity, Maintenance, Quality control, Material handling.

Total No of periods: 45

Text Books:

1. *M.C.Paliwal and P.D.Kimothi., " Process control in weaving ", ATIRA publications, Ahmedabad, 1983.*

References:

1. *Loom shed, BTRA PUBLICATIONS, Mumbai, 1986.*
2. *Warping and Sizing, BTRA publications, Mumbai, 1983.*
3. *Winding, BTRA publication, Mumbai, 1986.*

TT044 Advanced in Fabric Preparation**3 0 0 100****1 . 8**

Heat setting, temporary set, permanent set, Effect of heat on synthetic fibres-POY, FOY and textured yarns.

2 . 11

Development in grey preparation

3 . 10

Recent developments in mercerisation of cotton textiles.

4 . 11

Development in grey preparation machines.

5 . 5

Energy saving in preparatory process.

Total No of periods: 45

Reference :

- 1. Advances in Textile Chemical Processing, IIT, Delhi, 1981.*
- 2. Vigo, T.L., "Textile Processing and Properties , Preparation, Dyeing, finishing and performance ", Elsevier, 1994.*

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|--|-----------|
| 1 . INTRODUCTION | 5 |
| Definitions and classification of bonded fabrics. Historical development. Fibres used . Production and sales. | |
| 2 . WEB FORMING | 15 |
| Making the spun fibre web dry method and by wet method. Web laying. Webs manufacture from filaments. Uniformity of web. | |
| 3 . BONDING | 20 |
| Bonded fabric production by needling, stitching, water jet consolidatioin, thermal and chemical methods. Production of bonded fabrics by spun bonding and melt blown process. Structure property relationship in bonded fabrics. Effect of process parameters. | |
| 4 . END USES | 5 |
| Various end uses of bonded fabrics | |

Total No of periods: 45

Reference :

1. J. Lunenschloss, W.Albrecht and David Sharp., *Non-woven Bonded Fabrics*, Ellis Horwood Ltd, New York. 1985, ISBN: 0-85312-636-4.
2. Gulrajani.M.L., *Non wovens, textile Inst. Publication, Manchester, 1992.*
3. Mrstina.V and Feigl.F., *Needle punching Textile Technology, Elsevier, New York, 1990.*
4. Dharmadhikary,R.K., Gilmore, T.F., Davis,H.A., and Batra, S.K., *Thermal bonding of nonwoven fabrics, Textile Progress, Vol.26 No.2, Textile Inst.Publication, Manchester, 1995, ISBN: 1870812786*

TT046 Chemistry and Physics of Dyes**3 0 0 100**

| | |
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| 1 . | 18 |
| Chemistry of direct, vat, azoic, reactive, basic, acid and disperse dyes. | |
| 2 . | 8 |
| Chemistry of pigments | |
| 3 . | 7 |
| Definition of colour, perception of colour mixing laws, metamerism. | |
| 4 . | 7 |
| Colour order systems, colour difference measurements, colour assessment in textiles, optical theory for colour matching. | |
| 5 . | 5 |
| Effect of dye particle size on light scattering | |

Total No of periods: 45

References:

1. *Peters, A.T. and Freeman, H.S. (Eds), " Analytical chemistry of synthetic colorants ", Blackie, 1994.*
2. *Volz, H.G. " Industrial colour testing - Fundamental and Techniques ", VCH 1994.*
3. *Peters, A.T. and Freeman, H.S. " Physico-chemical principles of colour chemistry ", Blackie, 1995.*

TT047 Theory of Dyeing**3 0 0 100****1 . 10**

Physical chemistry, essential to dyeing theory

2 . 10

Thermodynamics of dye sorption.

3 . 13

Influence of fibre structure on dye up take.

4 . 5

Diffusion and rates of dyeing .

5 . 7

Dye-fibre bonds.

Total No of periods: 45

References:

1. *Bird C.L. and Boston W.S. (Editors), " The theory of colouration of textiles ", Dyers Company Publications Trust, 1975.*
2. *Shore, J., " Cellulosics Dyeing ", Society of Dyers and Colourists, 1995.*

TT048 Synthetic Fibre Colouration**3 0 0 100****1 . 10**

Mechanism of dyeing synthetic fibres; effect of fibre structure on dye up-take. Dyeing of PET polyester, nylon, polyacrylonitrile and polypropylene.

2 . 10

Mass colouration

3 . 8

Dyeing of polyester blends

4 . 6

Developments in synthetic fibre fabric dyeing machine applied on synthetic fibres.

5 . 11

Fastness properties of dyes applied on synthetic fibres. Auxiliaries used for dyeing synthetic fibres.

Total No of periods: 45

References:

1. *Gulrajani M.L., " Dyeing Polyester and its blends ", IIT, Delhi, 1987.*
2. *Burkinshaw, S.M., " Dyeing of synthetic fibres ", Blackie, 1995.*
3. *Shore J., " Blends dyeing ", SDC, U.K, 1998. ISBN: 090195446740*

TT049 Eco-Friendly Dyes and Chemicals**3 0 0 100****1 . 12**

Constitution of dyes and finishing agents -German legislation - list of banned dyes - azo dyes - benzidine dyes - pentachlorophenol.

2 . 12

Alternative dyes and chemical - structure - identification by chromatographic techniques.

3 . 9

Finishes - banned items - allowable dosages - alternatives to finishes.

4 . 12

Dry cleaning agents - pigments - bleaching agents - solvents - guidelines to dyestuff manufactures.

Total No of periods: 45*References:*

- 1. Are Textiles Finishing the environment?, " Textile Inst. ", Manchester, 1990.*
- 2. Finishers and the environment - solutions, " Textile Inst. ", Manchester, 1993.*
- 3. Reife A and Freeman H.S., " Environmental Chemistry of dyes and pigments ", Wiley, 1996, ISBN : 0471589276.*

1 . 12

Method study, procedure process chart, Flow and handling of materials, movements of workers, string diagram, method and movement in the work place.

2 . 18

Principles of motion economy: SIMO chart work measurement procedures; time study-equipment and forms - Job breaking down into units.

3 . 15

Rating, Scales, Factors, human Factor; Working condition - allowances-use of time standards-estimating - standardisation.

Total No of periods: 45*References:*

1. " *Introduction to work study* ", ILO Geneva 1989.
2. " *Industrial engineering manual for textile industry* ", Wiley industry (p) Ltd New Delhi 1988.
3. Enrick N.L. " *Time study manual for Textile industry* ", Wiley Eastern (p) Ltd 1989.
4. Chuter A.J. " *Introduction to clothing production management* " Black well science 1995.

TT051 Energy Management in Textile Industry

3 0 0 100

1 . 6

Source of energy; limitations of natural sources.

2 . 10

New technologies for energy; unexploited energy resources and problems in their exploitation.

3 . 10

Total energy concept energy consumption in spinning, weaving and processing; conservation of energy in such processes.

4 . 10

Techniques of energy saving; modification of technology or techniques towards saving in energy.

5 . 9

Scope of utilisation of by products for energy production captive power generation and its economics.

Total No of periods: 45

References:

1. " *Heat economy in Textile mills* ", ATIRA, Ahmedabad, 1984.
2. " *Energy conservation in Textile Industry* ", SITRA, Coimbatore, 1979.
3. Viallier. P., " *Energy uses in the Textile finishing industry* " Eurotex, 1990.
4. Sang Yang Kim, Grady, P.L. and Hersh, S.P. " *Energy consumption and conservation in the fibre producing and textile industry* ", T.P., Vol. 13, No.3, Textile Inst., 1983.

TT052 Costing**3 0 0 100****1 . 14**

Principles and objects of costing; different methods of costing; job costing, marginal costing; standard costing.

2 . 11

Costing and budget controls; material cost control; labour cost control and overhead control.

3 . 6

Despriciation on land, buildings and machines; methods of computing depreciation.

4 . 9

Cost accounting; profit and loss account; Balance sheets, ratio analysis; costing of yarn and fabrics.

5 . 5

Methods of calculating pay back period, return on investment discounted cash flow.

Total No of periods: 45

References:

- 1. Cost accounting for textile mills, ATIRA, Ahmedabad, 1974.*
- 2. Kantwala, D.N. Costing and cost control - A marginal approach for textile industry, Texcons, Bombay - 400 019, 1974.*

TT053 Textile Mill Planning and Management 3 0 0 100

1 . PRINCIPLES OF MANAGEMENT 4

planning, organisation, coordination, directing, controlling.

2 . PROJECT REPORT 8

Preparation of projects, location layout; selection of site for textile mills, Building structure; balancing of machinery for spinning and weaving.

3 . MAINTENANCE OF MACHINERIES 4

Schedule for maintenance, lubricants; type and characteristics of lubricants.

4 . LIGHTING, VENTILATION AND AIR CONDITIONING 18

Lighting requirements for textile mills - space for lighting humidification and ventilation - R.H. requirements- Air conditioning - various systems of air conditioning and humidification-motors electrical power and drives of various textile machinery.

5 . MATERIAL AND MAN MANAGEMENT 6

Material handling in textile mills: selection and training of operatives workload of operatives.

6 . FINANCIAL MANAGEMENT 5

Preparation of financial statement; Reading and preparation of Balance sheet and profit and loss account. Determination of the cost of yarn and fabrics.

Total No of periods: 45

References:

1. *Shukla M.C. " Business Organisation and Management ", sultan chand and sons 1975.*
2. *" Management in the textile industries: Textile Institute Manchester ", Longmans, London, 1988.*
3. *Dudeja D.V. " Management of textile industries ", Textile press, Ahmedabad 1981.*
4. *Jaganathan V. " Textile mill Technical Data Book ", Mahajan brothers, Ahmedabad 1976.*
5. *Ormerod A, " Textile Project Management ", Textile Institute Manchester, 1992.*

TT054 CAD and CAM in Textile Manufacture

3 0 0 100

1 . BASIC CONCEPTS

9

Overview of CAD and CAM - their application in various fields of textiles.

2 . COMPUTER HARDWARE

9

Centralised vs distributed computer systems, CPUs and memory - video terminals - graphic work stations - digitisers and scanners - 24 bit colour technology - storage devices - printers and plotters.

3 . DESIGN SOFTWARE

9

Autocad and its emulators - specific programmes for textile applications - The CIE colour system and the true colour representation - concepts of image processing.

4 . DESIGN FUNDAMENTALS

9

Weave patterns, their generation on computer monitors - printable designs screen and printer display - software.

5 . COMPUTER AIDED MANUFACTURING

9

Pattern generation and cutting in tailoring - shade tolerance testing computer controlled machines - stock control, statistical quality control, process costing.

Total No of periods: 45

References:

1. *Phiroz Dastoor, " Application of CAD in the Industrial Fabrics", Journal of the Textile Institute Part - 111, Manchester, 1993.*
2. *Groover, M.P. and Zinirnmers, E.W. " CAD/CAM Computer, Aided Design and Manufacture ", Prentice Hall India, 1984.*
3. *Vesant, C.E., " Computer adied design and manufature ", Ellis Harwood, England - 1983.*
4. *Aldrich, W. (Ed.), " CAD in clothing and textiles : A collection of experts view ", Blackwell Science, 2nd Edition, U.K., 1994.*
5. *Jayaraman, S, " Computer Science and Textile Science ", T.P. Vol.26 No.3, Textile Inst., Manchester, 1995.*
6. *Sigmon D.M. Grady, P.L. and Winchester S.C. " Computer integarated manufacturing and total quality management ", Textile Progress Vol 27, No 4, Textile Institute, Manchester, 1998. ISBN: 1870372166.*
7. *Gray S., " CAD/CAM in clothing and textiles ", Gower, U.K, 1998, ISBN: 056607673X.*
8. *" Instrumentation in the textile industry ", Instrument society of America, 11997, ISBN: 1556175973.*

TT055 Quality Assurance in Garment Industry**3 0 0 100**

| | |
|--|-----------|
| 1 . | 4 |
| Design satisfaction tests. | |
| 2 . | 5 |
| Fabric specification - cloth defects - four point system - shrinkage potential. | |
| 3 . | 10 |
| Garment specification - manufacturing specification - name of operation and associated details in respect of sewing, dyeing and washing of garments. | |
| 4 . | 7 |
| Style features - trims specification - stitch specification - size scale - garment dimensions and tolerances. | |
| 5 . | 4 |
| Quality of trims and accessories. | |
| 6 . | 5 |
| Defects in garments and their remedies - A, B and C zones in a garment with respect to defects. | |
| 7 . | 6 |
| Quality management concepts - quality control and inspections - S.Q.C. - acceptance sampling - T.Q.M. - I.S.O. | |
| 8 . | 4 |
| Laboratory testing for quality and performance. | |

Total No of periods: 45

References:

1. Mehta V., " *Managing quality in the apparel industry* ", New Age International, Chennai, 1998.
2. Sigmon, D.M., Grady P.L., and Winchester S.C., " *Computer Integrated Manufacturing and Total Quality Management* ", Textile Progress, The Textile Institute, Manchester, 1998.
3. Laing, R.M. and Webster J., " *Stitches and Seams* ", The Textile Institute, Manchester, 1998.
4. Glock R.E. and Kunz G.I., " *Apparel Manufacturing: Sewn Product Analysis* ", Prentice Hall, 1995.
5. Mehta P.V. " *An Introduction to Quality Control for the Apparel Industry* ", Marcel Dekker, 1992.
6. Cooklin G., " *Garment Technology for Fashion Designers* ", Blackwell Science, 1997.