

## Semester wise pattern of the M.Sc.-Textile Processing Course

### Semester I

Course No.	Title	Hr/Week	Credits	Marks
TXT 21001	Chemistry of Dyes & Pigments and their Applications	2	2	50
TXT 2103	Chemistry of Natural Fibres	2	2	50
TXT 2104	Chemistry of Man Made Fibres	2	2	50
TXT 2206	Chemistry of Textile Auxiliaries	2	2	50
TXT 2207	Pretreatment of Textiles	2	2	50
TXT 2105	Manufacture of Yarn and Fabric	2	2	50
	<b>Total</b>			<b>300</b>
TXP 2018	Textile chemicals and fibres analysis	4	2	50
TXP 2019	Synthesis and Analysis of Dyes & Intermediates	4	2	50
TXP 2008	Pretreatment Laboratory	4	2	50
TXP 2020	Project I (Literature survey, project plan and proof of concept)	4	2	50
	<b>Total</b>			<b>200</b>
	<b>Grand Total</b>		<b>20</b>	<b>500</b>

### Semester II

Course No.	Title	Hr/Week	Credits	Marks
TXT 2208	Dyeing of Natural Fibres	2	2	50
TXT 2209	Dyeing of Manmade Fibres	2	2	50
TXT 2210	Technology of Wet Processing Machinery	2	2	50
TXT 2302	Instrumental Methods of Analysis	2	2	50
TXT 2402	Processing of Garments	2	2	50
	<b>Total</b>			<b>250</b>
TXP 2009	Dyeing of Natural Fibres	4	2	50
TXP 2010	Dyeing of Manmade Fibres	4	2	50

TXP 2011	Testing & Application of Auxiliaries	4	2	50
TXP 2021	Computer applications in shade matching and colour Evaluation	4	2	50
TXP 2022	Project II	4	2	50
	<b>Total</b>			<b>250</b>
	<b>Grand Total</b>		<b>20</b>	<b>500</b>

### Semester III

Course No.	Title	Hr/Week	Credits	Marks
TXT 2211	Printing of Textiles	2	2	50
TXT 2212	Finishing of Textiles	2	2	50
TXT 2304	Evaluation of Processed Textiles	2	2	50
TXT 2806	Sustainability Aspects of Textile Processing	2	2	50
TXT 2213	Continuous Processing of Textiles	2	2	50
	<b>Total</b>			<b>250</b>
TXP 2012	Seminar	4	2	50
TXP 2013	Printing Lab	4	2	50
TXP 2014	Finishing Lab	4	2	50
TXP 2015	Fastness Lab	4	2	50
TXP 2023	Project III	4	2	50
	<b>Total</b>			<b>250</b>
	<b>Grand Total</b>		<b>20</b>	<b>500</b>

### Semester IV

Course No.	Title	Weeks	Credits	Marks
TXP 2016	Factory /Laboratory Training	15	8	200
TXP 2024	Project Presentation & Training Report	01	4	100
	<b>Grand Total</b>		<b>12</b>	<b>300</b>

**M.Sc. Grand Total: Credits- 72      Marks- 1800**

## Syllabus for the M. Sc. (Textile Processing) Two Year (4 Semesters) Course

### SEMESTER I

<b>Code &amp; Title of the Course</b>	<b>TXT 21001</b> <b>Chemistry of Dyes &amp; Pigments and It's Application</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M. Sc. (Textile Processing)	
<b>Semester</b>	I	
	<b>Course Contents (Topics and subtopics)</b>	<b>Reqd. hours</b>
1	Introduction of Dyes & Pigments, Colour Index Generic Names of colorants, Colour Constitution Number, Polymorphism Properties required in dye and pigment for textile coloration, Pigment dispersion basics, extenders, toners and lakes, Standardisation of dyes, diluents, toning compound etc.	4
2	Theory of color formation in organic compounds, effect of auxiliary groups on the shade and hue of the pigment (Bathochromic and hyper chromic shift) Practices and requirement of Pigments	4
3	Azo dyes: Diazotisation and coupling reactions, azoic colours, acid dyes, mono azo dye; diasazo, nitro, diphenylamine and anthraquinone dyes; acid mordant dyes, azo metal complex dyes, direct dyes	12
4	Introduction to classes of pigments, copper phthalocyanine and other colorants based on phthalocyanine. Organic pigments - Antraquinone, Benzimidazolonedioxazines, Diazo lakes	8
5	Basic dyes: Diphenylmethane and triphenylmethane dyes and heterocyclic analogues thereof, triphenodioxazine dyes. Disperse dyes: azo, anthraquinone, dinitrophenylamine, methine dyes; properties in relation to constitution	10
6	Vat dyes: Indigoid, anthraquinonoid and polycyclic quinonoid dyes; solubilised vat dyes. Sulphur dyes and sulphurised vat dyes	4
7	Reactive dyes: Chlorotriazine and other halo heterocyclic compounds, vinyl sulphone based dyes, high fixation, highly substantive, neutral fixing bifunctional	6
8	Smart Dyes: Introduction to Chromism, Types of Chromism, Classification, properties, synthesis and applications of Photochromic dyes/compounds.	6
9	Litholrubones, Monoazo lakes, Napthol AS lakes, Napthol AS, Perylenes, Phthalocyanines, Quinacridones effect pigments	6
<b>List of Text Books/ Reference Books</b>		

1	Color Chemistry, 3rd Edition, Heinrich Zollinger, Wiley – VCH 2003
2	Colorants and Auxiliaries: Colorants v. 1: Organic Chemistry and Application Properties, John Shore, Society of Dyers & Colourists; 2nd edition edition (Jan. 2002)
3	The Chemistry of Synthetic dyes, K. Venkataraman, Academic Press (1 January 1971)
4	Industrial Inorganic Pigments, Gunter Buxbaum, Wiley-VCH; 1 edition (March 11, 2005)
5.	Industrial Organic Pigments: Production, Properties, Applications, 3 <sup>rd</sup> , Completely Revised Edition by Herbst, Klaus Hunger Willy March 2006
6.	Application Properties of Pigments By A.Karnik, First Edition Thane1999
<b>Course Outcomes (students will be ....)</b>	
1	Able to understand fundamental knowledge on basics of chemistry involved in the colorants. (K2, A2)
2	Able to describe the types of pigments and their applications (K2, A2)
3	Able to understand and explain the physical properties of Pigments and dyes (K2, A2, S1)
4	Able to explain the synthetic methods used for azo dyes and their properties. (K2, A2, S1)
5	Able to explain the types of dyes on the basis of application, properties. . (K2, A3, S1)

<b>Code &amp; Title of the Course</b>	<b>TXT 2103</b> <b>Chemistry of Natural Fibres</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	I	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Classification of fibers ; Occurrence of polymeric materials; Fibre forming characteristics of polymers	4
2.	Natural fibres of commercial and rural importance such as cotton, Organic Cotton, wool, silk, ramie, jute, linen, pineapple, Natural Bamboo fibers (not by rayon route),etc	8
3.	Their occurrence, properties and uses.	6
4.	Morphology and chemical constitution.	6

5.	Action of various chemicals, micro-organisms, heat, radiations, etc.	6
----	--	---

**TEXT/REFERENCE BOOKS:**

1. Textile Fibres, Shenai V.A., Vol-1, Sevak Publications, Bombay, 3rd edition, 1991.
2. Joseph's Introductory Textile Science, Joseph, M.L., Hudson P.B., Clapp A. C., Fortworth: Harcourt Brace Jovanovich College Publication, 6th edition, 1993.
3. Modern Textile Characterization Methods, Raheel, M. Marcel Dekker Inc., New York, 1996.
4. Microscopy of Textile Fibres, Greaves, P.H., Saville B.P.Oxford : BIOS Scientific Publishers Ltd., 1995.
5. Handbook of Fibre Chemistry, Lewin Menachem, Eli M. Pearce, Marcel Dekker Inc., New York, 2nd edition, 1998.
6. Textile Fibres-I, Mathews, J.M, 4th edition, 1924.
7. Wool Handbook, Bergon W.V., Interscience Publishers, New York, 3rd edition, 1970.
8. Textile Chemistry, Peters R.H, Vol-1, Elsevier Publishing Company, London, 1963.

<b>Code &amp; Title of the Course</b>	<b>TXT 2104 Chemistry of Man Made Fibres</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	I	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Regenerated fibres such as viscose, cuprammonium, acetate, Tencel, etc.	2
2.	Raw materials, manufacture, properties and their uses; Chemical constitution.	4
3.	Synthetic & Semi Synthetic Fibre Spinning techniques; Action of various chemicals, micro-organisms, heat, radiations, etc.	4
4.	Synthetic fibres such as polyester, and differentially dyeable polyester, polyamides, acrylic, polypropylene, polyvinyl alcohol, polyurethane.	4
5.	Microfibres, Raw materials, synthesis, manufacture, properties and uses; chemical constitution; Action of various chemicals, micro-organisms, heat, radiations, etc.,	4

6.	Various modified forms of Synthetic fibres like antistatic, antipilling, etc.	4
7.	Spin Draw Process; Concept of LOY, MOY, POY and FOY.	4
8.	Introduction to drawing and heat setting in thermoplastic fibres. Role of spin finish and fibre crimp in processing.	4

### Text/reference books

1. Textile Fibres, Shenai V.A., Vol-1, Sevak Publications, Bombay, 3rd edition, 1991.
2. Joseph's Introductory Textile Science, Joseph, M.L., Hudson P.B., Clapp A. C., Fortworth: Harcourt Brace Jovanovich College Publication, 6th edition, 1993.
3. Modern Textile Characterization Methods, Raheel, M. Marcel Dekker Inc., New York, 1996.
4. Microscopy of Textile Fibres, Greaves, P.H., Saville B.P.Oxford : BIOS Scientific Publishers Ltd., 1995.
5. Handbook of Fibre Chemistry, Lewin Menachem, Eli M. Pearce, Marcel Dekker Inc., New York, 2nd edition, 1998.
6. Textile Fibres-I, Mathews, J.M, 4th edition, 1924..
7. Man-made Fibres, Moncriff, R.W., Butterworth Science, London, 6th edition, 1975.
8. Textile Chemistry, Peters R.H, Vol-1, Elsevier Publishing Company, London, 1963.
9. Production of Synthetic Fibres, Vaidya A.A., Prentice Hall of India Pvt. Ltd., New Delhi, 1988.
10. Manufactured Fibre Technology by V C Gupta and V K Kothari

<b>Code &amp; Title of the Course</b>	<b>TXT 2206</b> <b>Chemistry of Textile Auxiliaries</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	I	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Nomenclature, functions and classification of textile auxiliaries	4
2.	Surfactants their chemistry and applications. Surface activity	8
3.	Chemistry, Properties & uses of anionic, Cationic, Non-ionic surfactants.	8
4.	Qualitative and quantitative evaluation of auxiliaries; Testing of surfactants	6

5.	Biodegradability of surfactants	2
6.	Recent developments in textile auxiliaries	2

### Text/reference books

1. Colourants and Auxiliaries: Organic Chemistry and Application Properties, Shore, J., SDC, Bradford, 1990.
2. Laundry Detergents, Smulders, E., Wiley VCH, Weinheim, 2002.
3. Chemistry and Textile Auxiliaries, Shenai V.A., Vol. 65, Sevak Publication, Bombay, 2nd edition, 2002.
4. Textile Auxiliaries, Batty, J.W., Dergamon Press, Oxford, 1967.
5. Textile Chemicals and Auxiliaries, Speel H.C., Reinhold Processing Corporation, New York, 1952.

<b>Code &amp; Title of the Course</b>	<b>TXT 2207</b> <b>Pretreatment of Textiles</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	I	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Sizing, Sizing Chemicals; Various pretreatment sequences for different varieties of textiles.	3
2.	Shearing and Cropping; Singeing, latest technologies in singeing, Desizing of cotton; different desizing methods.	3
3.	Techniques for scouring and bleaching of cotton; Machinery used for these preparatory processes Mercerization, caustic recovery plant and its efficiency.	3
4.	Ammonia mercerization, its significance, additional benefits, technical specifications of machinery for ammonia mercerization, Heat setting, Silk degumming and bleaching;	3
5.	Scouring and bleaching of wool; Bioscouring, Carbonization of wool.	3
6.	Scouring and bleaching of synthetics and their blends with natural fibres.	3

7.	Bleaching and various auxiliaries in bleaching.	3
8.	Washing principles and methods used different types of continuous washers for textiles.	2
9.	Concept of conservation of chemicals, energy and water, Raw materials like water, chemicals and auxiliaries.	3
10.	Pretreatment of Knit goods; Mercerization of Knits.	2
11.	Pretreatment of Yarn and cone dyed yarns.	2

### Text/reference books

1. Technology of Bleaching and Mercerizing, Shenai V.A., Sevak Publication, Bombay, Vol. - 3, 3rd edition, 2003.
2. Textile Bleaching, Steven A.B., Pitman and Sons, London.
3. Technology of Scouring and Bleaching, Trotman E.R., Griffin, London, 1968.
4. Technology of Bleaching and Dyeing, Chakraverty, R.R., Trivedi S.S., Vol. 1, Mahajan Publishers Private Ltd., Ahmedabad, 1979.
5. Textile Chemistry, Peters R.H, Vol-2, Elsevier Publishing Company, London, 1967.
6. Sizing by D.B.Ajgaonkar, M.K.Talukdar and V.R.Wadekar
7. Mercerizing by J.T.Marsh
8. Chemical Technology in the Pre-treatment Processes of Textiles by S.R.Karmakar

<b>Code &amp; Title of the Course</b>	<b>TXT 2105</b> <b>Manufacture of Yarn and Fabric</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M.Sc. (Textile Processing)	
<b>Semester</b>	I	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Grading of natural and synthetic fibres; Fibre properties and their measurements	3
2.	Preparatory processes and machinery used for manufacture of yarn from natural and synthetic fibres;	3
3.	Spinning of yarn-ring and rotor spinning, friction spinning, air-jet spinning.	2



4.	Natural and Synthetic fibres for blended and fancy yarns	2
5.	Yarn properties and their measurement; Doubling of yarns; Requirement of yarn for weaving/knitting – based on end use.	3
6.	Warp and weft preparation, Sizing of yarn – machinery involved	3
7.	Weaving of fabric – loom, use of dobby and jacquard.	3
8.	Shuttleless looms – air jet, rapier, etc. for high speed weaving, Sulzer(Projectile), Water jet .	3
9.	Fabric construction and their effect on various properties – related to end use;	2
10.	Cloth analysis – weaves such as plain, twill, satin, etc.; Subjective evaluation of different fabric qualities.	3
11.	Fabric defects, causes and remedies.	3

### Text/reference books

1. Weaving: Machines, mechanisms, management, Talukdar, M.K., Sriramulu P.K., Ajsaonkar D.B., Mahajan Publishers Private Ltd., Ahmedabad, 1998.
2. Textiles – Fibre to Fabrics, Corbman B.P., McGraw Hill Book Company Inc., New York, 6th edition, 1983.
3. Manual of Textile Technology, Klein, W., The Textile Institute, Manchester, Vol. 1-6, 1987.
4. The Motivate series Textiles, A.Wynne.
5. Textile Yarns, Technology, Structure and Applications, B.C. Goswami, J.G.Martindale and F.L.Seardino.
6. Weaving – Conversion of Yarn to Fabric, P.R.Lord and M.H.A.Mohamed.
7. Knitting Technology, D.B.Ajsaonkar.
8. Elements of Spinning, Blow Room, Carding, Comber and Ring Frame, Vol. 1-4, A.R.Khare.
9. Textile Design and Colour, Watson.

<b>Code &amp; Title of the Course</b>	<b>TXP 2018</b> <b>Analysis of Textile Chemicals and Fibres</b>
<b>Marks</b>	50
<b>Number of Hours per Week</b>	4
<b>Credits</b>	2

<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	I	
<b>Sr. No.</b>	<b>Course contents (topics/subtopics)</b>	<b>Required hrs</b>
1	Estimation of bleaching powder and sodium chlorite	4
2	Estimation of sodium silicate and sodium carbonate	4
3	Estimation of composition of alkali mixture and barium hydroxide	4
4	Estimation of Glauber's salt and sodium chloride	4
5	Estimation of chrome alum and hardness of water	4
6	Estimation of sodium hydrosulphite and Rangolite C	4
7	Estimation of formaldehyde and oxalic acid	4
8	Estimation of sodium alginate	4
9	Estimation of acid value and Iodine value of fatty acids	4
10	Estimation of efficiency of Sizing chemicals	4
11	Estimation of Chelating agents	4
12	Estimation of bleaching powder and sodium chlorite	4
13	Identification of fibres by microscopic and Chemical methods	4
15	Identification and estimation of fibres from binary and tertiary blends by chemical methods	4
20	Determination of yarn count and Fibre fineness by Cut-Weight Method	4
22	Determination of twist in double and single yarn	4
23	To measure Yarn Appearance, Hairiness/yarn imperfections (Zwellager)	4
25	To determine Types of weave and plot Weave Diagram	4
26	To measure Fabric GSM and Fabric Count (Ends/pick, Wales/course)	4
27	Determination of the yarn strength and elongation at break	4
<b>List of Text Books/ Reference Books</b>		
1	Technology of Bleaching and Mercerizing, Shenai V.A., Sevak Publication, Bombay, Vol. - 3, 3rd edition, 2003.	
2	Textile Bleaching, Steven A.B., Pitman and Sons, London.	
3	Technology of Scouring and Bleaching, Trotman E.R., Griffin, London, 1968.	
4	Technology of Bleaching and Dyeing, Chakraverty, R.R., Trivedi S.S., Vol. 1, Mahajan Publishers Private Ltd., Ahmedabad, 1979.	
5	Textile Chemistry, Peters R.H, Vol-2, Elsevier Publishing Company, London, 1967.	
6	Sizing by D.B.Ajgaonkar, M.K.Talukdar and V.R.Wadekar	
7	Mercerizing by J.T.Marsh	

8	Chemical Technology in the Pre-treatment Processes of Textiles by S.R.Karmakar
<b>Course Outcomes</b> (students will be able to..... )	
1	Able to estimate the purity of the different acids, alkali, reducing agents, oxidizing agents used in the textile processing. (K4, A3, S2)
2	Able to find the efficiency e.g. of Sizing chemicals, blend analysis, fibre identification by microscopic and by chemical methods. (K5, A3, S3)
3	Able to describe, carry out and use yarn twist/count, Appearance, Hairiness/yarn imperfections, fabric GSM. (K2, A3, S3)
4	Able to describe, interpret, examine and determine twist in double and single yarn, strength and elongation at break. (K3, A3, S3)
5	Able to carry out and use measurement of maturity and fineness of fibres by airflow instrument. (K3, A3, S2)
6	Able to evaluate types of weave using weave diagram. (K5, A3, S3)

<b>Code &amp; Title of the Course</b>		<b>TXP 2019 Synthesis and Analysis of Dyes and Intermediates</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		4
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		I
<b>Sr. No.</b>	<b>Topic</b>	<b>Hr</b>
1.	Preparation of p-Nitroso N,N-dimethyl aniline Hydrochloride.	4
2	Synthesis of Benzocoumarin	4
3.	Preparation of p-Amino acetanilide	4
4.	Synthesis of para-dimethyl amino benzaldehyde	4
5.	Synthesis of 1,2,4-Acid Diamino stilbene disolphonic acid	4
6.	Preparation of Indophenol blue	4
7.	Synthesis of Acid Blue 40	4
8.	Preparation of Metal complex dyes	4
9.	Synthesis of Xanthene dyes	8
10.	Preparation of dis azo dye	4
11.	Synthesis of Azo coumarin dye	4
12	Synthesis of Malachite Green	4
13.	Preparation and chemical analysis of triazine based optical brightner	4

14.	Preparation of coumarin based functional colorants	4
-----	--	---

<b>Code &amp; Title of the Course</b>		<b>TXP 2008: Pretreatment Laboratory</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		4
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		I
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Desizing cotton-acid desizing, enzyme desizing, oxidative desizing of cotton.	4
2	Evaluation of desizing efficiency-staining with iodine, loss in weight and estimation.	4
3.	Scouring of cotton-open boil, pressure boil, pad-steam process.	4
4.	Evaluation of scouring efficiency-wetting time, sinking time, loss in weight.	4
5.	Bleaching of Cotton by bleaching powder, hydrogen peroxide.	4
6.	Bleaching of polyester and nylon with sodium chlorite and hydrogen peroxide.	4
7.	Evaluation of bleaching efficiency -whiteness index and % reflectance.	4
8.	Mercerisation of cotton with and without tension.	4
9.	Evaluation of mercerization-Shrinkage, Barium Activity no., dye uptake, strength and elongation and microscopic observation.	8
10.	Scouring and bleaching of wool.	4
11.	Degumming and Bleaching of Silk.	4
12	Scouring and bleaching of polyester/cotton blends.	4
13.	Assessment of cotton for degradation by Copper Number, Cuprammonium Fluidity or by Methylene Blue Absorption.	4
14.	Application of OBA/FBA on natural and synthetic fabrics and evaluation of fabric.	4

<b>Code &amp; Title of the Course</b>		<b>TXP 2020</b>
		<b>Project I: Literature survey, project plan and proof of concept</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		4
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		I

<b>Sr.No.</b>	<b>Top</b>	<b>Hrs.</b>
1.	Student will be required to make a detailed literature search of the proposed area to be undertaken under the guidance of the research supervisor. In general, a written review report along with his proposed plan of research work emanating from it needs to be submitted in the form of standard typed report. The student will also be required to perform preliminary experiments to achieve proof of concept.	50

## SEMESTER II

<b>Code &amp; Title of the Course</b>	<b>TXT 2208</b>	
	<b>Dyeing of Natural Fibres</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	II	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Classification of colouring matters according to their application to the textile fibres.	3
2.	Physical and chemical structures of fibres and dyes in relation to dyeing.	3
3.	Interaction between dye molecules and the fibres.	3
4.	Dyeing of different dyestuffs onto various natural textile fibres.	3
5.	Rapid dyeing concept.	3
6.	Dye-fibre bonds and parameters affecting them.	3
7.	Thermodynamics of dyeing process; Kinetics of dyeing;	2
8.	Affinity of dyes towards the fibres; Adsorption isotherms; Equilibrium adsorption and factors influencing the same.	2
9.	Saturation value; Diffusion coefficient.	2
10.	Glass transition temperature and its effect on dyeability;	2
11.	Electro-kinetic properties of dye-fibre systems.	2
12.	Compatibility of dyes in mixtures; Dyeing of fibre blends and shade matching.	2

### Text/reference books

1. Reactive Dyes for Textile Fibres, Renfrew A., A. Hunter M., SDC Publ., Bradford, 1999.
2. The Theory and Practice of Wool Dyeing, Bird, C.L., SDC Publ., Bradford, 1972.

3. Theory of Colouration of Textiles, Johnson A.s, SDC Publ., Bradford, 2nd edition, 1989.
4. Chemical Processing of Synthetic Fibres and Blends, K.V. Datye and A.A. Vaidya, John Wiley and Sons, New York, 1984.
5. Textile Chemistry, Peters R.H, Vol-3, Elsevier Publishing Company, London, 1975.
6. Chemical Processing of Synthetic Fibres and Blends, Datye K.V., Vaidya A.A., Wiley-Interscience Publ., New York, 1984.

<b>Code &amp; Title of the Course</b>	<b>TXT 2209</b> <b>Dyeing of Manmade Fibres</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	II	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Dyeing of different dyestuffs onto various synthetic textile fibres such as; polyester, nylon, polyacrylic etc.	8
2	Rapid dyeing concept	4
3.	Theories behind different techniques such as solvent dyeing, mass colouration, heat transfer colouration etc.	8
4.	Dyeing of union and blended fibre fabrics; Dyeing of micro fibre fabrics.	4
5.	Compatibility of dyes in mixtures; Dyeing of fibre blends and shade matching.	4
6.	Concept of ecofriendliness in dyestuffs and dyeing techniques.	2

#### **Text/reference books**

1. Theory of Colouration of Textiles, Johnson A.s, SDC Publ., Bradford, 2nd edition, 1989.
2. Chemical Processing of Synthetic Fibres and Blends, K.V. Datye and A.A. Vaidya, John Wiley and Sons, New York, 1984.
3. Textile Chemistry, Peters R.H, Vol-3, Elsevier Publishing Company, London, 1975.
4. Chemical Processing of Synthetic Fibres

<b>Code &amp; Title of the Course</b>		<b>TXT 2210</b> <b>Technology of Wet Processing Machineries</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		2+1
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		II
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Earlier developments in processes and machinery for dyeing of textiles in various forms such as loose fibres, yarns as well as woven and knitted fabrics.	4
2	Batch type, semi-continuous and continuous type dyeing machinery for all forms of textiles.	4
3.	Dosing systems for dyeing, automatic colour and chemical dispensing systems, automated inventory management systems for dyes and chemicals	4
4.	Faults in dyed materials and their correction.	4
5.	Machinery used for washing and soaping of dyed materials.	4
6.	Application and functions of dyeing assistants.	4
7.	Developments in machinery and dyeing techniques.	4
8.	Concept of conservation of chemicals and water in dyeing.	2

### Text/Reference Books

1. Handbook of Synthetic Dyes and Pigments, K.M.Shah, Multitech Publishing Company, Bombay, 2nd edition, 1998.
2. Technology of Dyeing, Shenai V.A., Vol. 6, Sevak Publication, Bombay, 2nd edition, 1994.
3. A manual of Dyeing : For use of Practical Dyers, Manufactures, Students and all interested in art of dyeing, E. Knecht, C. Rawson, R.Loewenthal, Charles Griffin and Company Ltd., London, Vol. 1, 1983.

<b>Code &amp; Title of the Course</b>		<b>TXT 2302</b> <b>Instrumental Method of Analysis</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		2+1
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		II
<b>Sr.No</b>	<b>Topic</b>	<b>Hrs.</b>

1	Fourier Transform Infrared Spectroscopy: Instrumentation and advantages of FTIR spectrophotometry; Qualitative and quantitative analysis using infrared spectrophotometry. Ultraviolet and Visible Spectrophotometry: Application in pollution control and chemical industry.	6
2	Nuclear Magnetic Resonance: Basic principle of NMR phenomenon, relaxation processes, spin-spin interaction, chemical shifts, interpretation of NMR spectra, correlation-hydrogen bonds to carbon and other nuclei; Instrumentation-Continuous and pulsed NMR, carbon- <sup>13</sup> NMR.	4
3	X-ray Diffraction: Crystal geometry and structural determination; Bragg law of X-ray diffraction, powder method; X-ray spectrometers-wide and small angle diffractometers; Chemical analysis by X-ray diffraction.	6
4	Particle Size Analysis: Particle size, sampling, conventional techniques of particle size measurement, light scattering, particle size measurement by light scattering techniques; Dynamic light scattering (DLS), fibre optic dynamic light scattering (FDLS).	4
5	Chromatography: Basic theory of separation, efficiency, resolution: Liquid chromatography, high performances liquid chromatography; Gas chromatography-columns and detectors; Qualitative and quantitative analysis.	5
6	Mass Spectroscopy: Basic principle, ionization of a molecule on electron impact, fragmentation processes in organic compounds, interpretation of mass spectra, molecular weight, molecular formula; Instrumentation-different types of ionization sources and magnetic analyzer.	5

### Text/reference books

1. Fundamentals of Molecular Spectroscopy - C. Banwell and E. McCash
2. Instrumental Methods of Analysis - H. H. Willard, I. M. Merritt and J. A. Dean
3. Dye Lasers - F. P. Schafer
4. Infrared Spectra of Complex Molecules - L. J. Bellamy
5. Fundamentals of Surface and Thin Film Analysis - L. C. Feldman and J. W. Mayer
6. X-ray Structure Determination - G. H. Stout and I. H. Jensen
7. High Resolution NMR Spectroscopy - E. D. Becker
8. Nuclear Magnetic Resonance Spectroscopy—R. X. Harris
9. Physical Methods - R. S. Drago
10. Advances in Electrochemical Science and Engineering - I. Gerischer and C. W. Tobias (eds.)



<b>Code &amp; Title of the Course</b>	<b>TXT 2402</b>	
	<b>Processing of Garments</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	II	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Aim and scope of readymade garment field with special reference to textile wet processing.	3
2.	Brief introduction to various departments in a garment export house. General	3
3.	Concept of pre garment stage and garment stage processing.	2
4.	Concept of garment finishing, general precaution to be taken during finishing of cotton, wool, silk, rayon, woven and knitted materials	2
5.	Fabric and sewing thread selection, Process Sequence, Flow Chart.	3
6.	Garment processing machines- Pedal dyeing machines, winch dyeing machines, soft overflow dyeing machines, tumble dryers, relax dryers, table printing, garment flat bed printing machines with no. of printing stations, transfer printing, digital printing, washing machines.	3
7.	Speciality Finishes on Garments, Wash down effects on Denim, Laundering	3
8.	Stain Removal - general procedure of stain removal, Classification of stains, Principles of stain removing. Classification of stain removers.	3
9.	Application techniques for stain removers, i) Local Application II) Bulk Application,	2
10.	Dry Cleaning - General introduction, objective and principle of the dry cleaning process, dry cleaning chemicals, detailed description of dry cleaning operations (sequential steps),	3
11.	Dyeing in Garment form with pigment / reactive / sulphur Colour.	3

### **Text/reference books**

1. Chemical after treatments of textile by Marks, Atlas & Wooding.
2. Textile finishing by A.J. Hall.
3. Introduction to textile finishing by J.T. Marsh.
4. Technology of finishing - Vol. X by Dr. V.A. Shenai.
5. Chemical processing of polyester/cellulosic blends by R.M. Mittal and S.S. Trivedi.
6. Silk dyeing, printing and finishing by Prof. M.L. Gulrajani.

7. Garment Finishing & Care Labelling by S.S.Satsangi, Usha Publishers, 53-B/AC-IV, Shalimar Bagh, New Delhi.
8. Stain Removing Techniques by S.S.Satsangi, Usha Publishers, 53-B/AC-IV, Shalimar Bagh, New Delhi.
9. Fabric Care by Noemia D'SOUZA, New Age International Publishers, Daryaganj, New Delhi
10. Garment Processing, Mittal, R.M.

Code & Title of the Course		TXP 2009
		<b>Dyeing of Natural Fibres</b>
Marks		50
Number of Hours per Week		4
Credits		2
Class		M Sc (Textile Processing)
Semester		II
Sr.No.	Top	Hrs.
1..	To study the effect of liquor ratio and salt concentration on exhaust dyeing of direct	4
2	To study the effect of temperature on exhaust dyeing of direct dyes on cotton.	4
3.	To study effect of percentage shade on exhaust dyeing of direct dyes on cotton and determine the absorption of exhausted bath.	4
4.	To study various after treatments of direct dye dyeing.	4
5.	To study dyeing of different types of reactive dyes on viscose and cotton by exhaust and padding technique	4
6.	To study the effect of pretreatments of cotton on dyeing with direct dye.	4
7.	To study dyeing of azoic colours on cotton by exhaust and padding technique	4
8.	To study dyeing of solubilised vat dyes on cotton.	4
9.	To study dyeing and after treatments of sulphur dyes on cotton.	4
10	To study the dyeing of vat dyes on cotton by exhaust and padding technique	4
11	To study Pigment dyeing on cotton by padding technique	4
12	To study dyeing of acid dyes on wool and silk .	4
13	To study dyeing of cotton, viscose, wool and silk using basic dyes.	4
14	To study dyeing of wool and silk using metal complex dyes.	4
15	To study dyeing of wool and silk using acid mordant dyes.	4

<b>Code &amp; Title of the Course</b>		<b>TXP 2010</b>
		<b>Dyeing of Manmade Fibres</b>
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	4	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	II	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	To study dyeing of polyesters using different disperse dyes and dyeing techniques and measurement of absorbance of extracted dye.	16
2	To study comparative dyeing of PET, CDPET, PBT with disperse dyes at boil and 130 <sup>0</sup> C.	8
3.	To study dyeing of Nylon, polypropylene, acrylic with disperse dyes.	8
4.	To study dyeing of Nylon with acid, metal complex , reactive and direct dyes.	8
5.	To study dyeing of acrylic fabric and CDPET with cationic dyes.	4
6.	Dyeing of Polyester on soft flow machine.	4
7.	Dyeing of Polyester/cotton blend on soft flow machine.	4
8.	Processing of Cotton/Elastane blends in Soft flow.	4
9.	Processing of Polyester/Viscose, Polyester/Wool blends in Jets.	4

<b>Code &amp; Title of the Course</b>		<b>TXP 2011</b>
		<b>Testing &amp; Application of Auxiliaries</b>
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	4	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	II	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Determination of Water Solubility of Direct and Reactive Dyes.	4
2	Determination of Dispersability of Vat and Disperse Dyes.	4
3.	To determine the Solid Content of different auxiliaries.	4
4.	Determination of Ionic nature of different auxiliaries.	4
5.	To determine the efficiency of Wetting Agents.	4
6.	To determine the efficiency of Levelling agent and emulsifier.	8
7.	BOD and COD determination of various textile auxiliaries.	4

8.	Qualitative and quantitative analysis of printing binders.	8
9.	Qualitative and quantitative analysis of dye fixing agent.	4
10.	Qualitative and quantitative analysis of stabilizer in peroxide bleaching.	4
11.	To study the effect of metals on dyeing shade.	4
12.	Estimation of efficiency of peroxide stabilizer.	4
13.	Determination of Amylase activity.	4

<b>Code &amp; Title of the Course</b>		<b>TXP 2021</b> <b>Computer Applications in Shade Matching &amp; Colour</b> <b>Evaluation</b>
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	4	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	II	
<b>Sr. No.</b>	<b>Course contents (topics/subtopics)</b>	<b>hrs</b>
1	Beer – Lambert law and its verification using different dye classes on UV Visible Spectrophotometer	4
2	Plotting of Calibration curves of Reactive and Disperse dyes on UV Visible Spectrophotometer	8
3	Measurement of different attributes of dyed fabrics like L,a,b,C,h, K/S , Delta E, metamerism, Reflectance and strength on the Spectrophotometer	4
4	To study the change in L,a,b,C,h, K/S , Delta E, metamerism, Reflectance and strength with % shade	4
5	To study dyeing of cotton hank by tub liquoring using azoics	4
6	To study dyeing of cotton \ polyester blend by different techniques	4
7	Beck matching of vat colours on cotton yarns visually and using CCM	4
8	Preparation of standard shade bank of Vat and Disperse dyes using three basic colors	12
9	Shade matching of Cotton using Reactive Dyes visually and using CCM	12
10	Shade matching of polyester using Disperse Dyes visually and using CCM	12

<b>Code &amp; Title of the Course</b>	<b>TXP 2022</b> <b>Project II</b>
<b>Marks</b>	50
<b>Number of Hours per Week</b>	4
<b>Credits</b>	2
<b>Class</b>	M Sc (Textile Processing)
<b>Semester</b>	IV

<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	This would be concerned with the continuation of the research project executed in the first semester and the exact work plan will be decided in consultation with the research guide. At the end of the project, the candidate is expected to submit a report e which will be evaluated by the research guide and an external examiner from the Department/Industry based on the presentation made by the candidate. A suitable combination of the marks for report and presentation will be considered for the final evaluation	50

### SEMESTER III

<b>Code &amp; Title of the Course</b>	<b>TXT 2211</b> <b>Printing of Textiles</b>	
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	III	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Preparation of fabrics for printing.	1
2	Steps in printing of various fabrics.	1
3.	Historical printing techniques.	2
4.	Selection of thickening agents, chemicals and dyestuffs for printing.	2
5.	Formulation and rheological properties of printing pastes.	2
6.	Printing of textile materials with different dyes; Printing of blended fibre/fabrics.	2
7.	Machines used for printing.	2

8.	steaming and other methods of print development.	2
9.	Brief idea about preparation of flat and rotary screens for printing.	2
10.	Different methods of printing and styles of printing.	2
11.	Aftertreatment of printed materials.	2
12.	Faults in printing, their prevention and correction.	2
13.	Special printing techniques; Printing of velvet, carpets and knits .	2
14.	Ecological printing of textiles.	2
15.	Recent developments in printing machinery and techniques.	2
16.	Concept of conservation of water and chemicals in printing.	2

### Text/reference books

1. Dyeing and Printing, Cockett S.R., Hilton K.A., Leonard Hill Books Ltd., London, 1961.
2. Introduction to Textile Printing, W. Clarke, Newness Butterworths, London, 4th edition, 1977.
3. Guide to Printing Techniques, Naoharu Oyabu, Mahajan Brothers Publish Ltd., Ahmedabad, 1978.
4. Technology of Printing, V.A. Shenai, Sevak Publications, Bombay, Vol. 4, 1990.

<b>Code &amp; Title of the Course</b>		<b>TXT 2212</b> <b>Finishing of Textiles</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		2+1
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		III
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs</b>
1..	Object of Finishing, Classification of finishes.	2
2	Mechanical finishes of cotton and synthetic fabrics like Calendaring, raising, sueding,	2
3.	Heat setting of synthetic fabrics; Machinery used and their principles involved.	2
4.	Techno mechanical features automation of machinery in textile finishing.	2
5.	Drying equipment; stenters, vertical drying ranges, curing ranges. Efficiency of drying, use of process control systems to enhance efficiency of drying.	2
6.	Finishes of blended fabrics, types of setting, Heat Setting of Polyester and its blends, structural changes brought about by heat setting, Various methods to determine the degree of heat setting.	2
7.	Antifelting, carbonizing and other finishes for wool and silk.	2

8.	Finishing of knitted and texturised fabrics.	2
9.	Evaluation and durability of finishes.	2
10.	Chemical finishing agents like stiffeners, binders, weighting agents, softeners, optical brighteners, etc.	2
11.	Chemistry and technology used for improving wrinkle resistance, wash and wear, and durable press properties of fabrics; Non-formaldehyde finishes Technologies for resin finishing- Pad-dry cure and Moist cross linking ( batch wise and continuous methods)	2
12.	Study of various types of finishes such as creeping, softening, stiffening, wetting, antipilling, laminating, etc.; Organdie finish.	2
13.	Functional finishes like antibacterial, flame retarding, water/oil repelling, soil release, antistatic finishes, Moisture management, UV Protection, Cellulase Bio Polishing etc.	2
14.	Evaluation and durability of above mentioned finishes.	1
15.	Concept of conservation of chemicals, water, energy through different techniques and machineries.	2
16.	Eco-friendliness of various finishes.	1

#### Text/reference books

1. Encyclopedia of Textile Finishing, Rouette, H.K., Springer Verlag, New York, 2001.
2. Handbook of Fibre Finish Technology, Slade, P.E., Marcel, New York, 1998.
3. Textile Finishing, Hall A.J., Heywood book, London, 1966.
4. An Introduction to Textile Finishing, Marsh J.T., B.I. Publication, Bombay, 1979.
5. Technology of Finishing, V.A.Shenai, Vol. 10, Sevak Publication, Bombay, 1990.
6. Low liquor Dyeing and Finishing – Textile Institute, Manchester.

<b>Code &amp; Title of the Course</b>		<b>TXT 2304</b> <b>Evaluation of Processed Textiles</b>
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	2+1	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	III	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs</b>
1..	Objects of testing; Introduction to textile testing, Selection of samples for testing, Random and biased samples, Testing of raw materials and finished products.	2
2	Various test specifications such as BIS, AATCC, ISO, etc.	2
3.	Tensile testing of fibres, yarns and fabrics.	2

4.	Tearing, bursting and abrasion resistance tests for fabrics	2
5.	Pilling resistance of fabrics.	2
6.	Bending, shear and compressional properties of fabrics	2
7.	Fabric drape and handle.	2
8.	Crease and wrinkle behaviour	2
9.	Air, water and water-vapour transmission through fabrics.	2
10.	Thermal resistance of fabrics	2
11.	Testing of interlaced and textured yarns.	2
12.	Testing in relation to quality control	2
13.	Ecotesting of textiles	2
14.	Evaluation of colourfastness properties	2
15.	Norms of global standards for textile production and use, e.g. care labels, eco labels, Lab Accreditation, ISO 17025, etc.	2

### Text/reference books

1. Textile Analysis, Trotman E.R., Trotman S.R., Charles Griffin and Co., London, 1932.
2. Principles of Textile Testing : An introduction to Physical methods and Testing textile fibres, yarn and fabric, Booth J.E., Heywood Books, London, 3rd edition, 1968.
3. Textile Testing and Analysis, Collier, B.J. and Hellen H., Upper Saddle River: Pentice Hall Inc., 1999.
4. Microscopic and Chemical Testing of Textiles, Koch, P.H., Chapman and Hall, London, 1963.
5. Physical Properties of Textile Fibres, Morton, W.E. and Hearle, J.W.S., Textile Institute, Manchester, 2nd edition, 1975.
6. Society of Dyers and Colourists : standard methods for the determination of the colour fastness of Textiles and Leather.
7. Handbook of Textile Testing and Quality Control, Grover, B. and Hemby, P.S., Wiley Eastern Ltd., New Delhi, 2nd edition, 1988.

<b>Code &amp; Title of the Course</b>	<b>TXT 2806</b>
	<b>Sustainability Aspects of Textile Processing</b>
<b>Marks</b>	50
<b>Number of Hours per Week</b>	2+1
<b>Credits</b>	2
<b>Class</b>	M Sc (Textile Processing)



Semester		III
Sr.No.	Topic	Hrs.
1..	Introduction to Environmental Management - Definitions of environment, ecology, pollution.	2
2	Types of pollution and effects of stages of textiles on environment.	2
3.	General waste categorization effective pollution prevention programme.	2
4.	Testing of Effluents for various characteristics such as BOD, COD, Turbidity, TDS, SS, Grease, Oils; Types of textile effluents and their characteristics.	2
5.	Introduction to Eco System - changes of eco system like carton cycle, Nitrogen cycle & phosphorus cycle.	2
6.	Current eco system problems.	2
7.	Environmental problems and human health.	2
8.	Risk assessment and risk management.	2
9.	Ecology and textiles.	2
10.	Toxicological considerations of textile processing.	2
11.	Effluent Treatments - Methods of Treatment of Textile effluents - preliminary treatment - flocculation & coagulation - oxidation by bio-chemical methods, sedimentation - Filtration - Tertiary Treatment , Membrane separation.	2
12.	Concept of Zero discharge, Multiple effect Evaopration, sludge disposal - Analysis of effluents - Reuse of water -cost of effluent treatment, design of typical ETP.	2
13.	Current Global Textile Laws for different countries and End uses.	2
14.	Tracking through the life cycle of an textile article	2
15.	Water Footprint, Energy Footprint, Chemical Footprint, Carbon Footprint	1
16.	Eco conformance certifications – OekoTex (Confidence in Textiles), GOTS, REACh, etc.	1

### Text/reference books

1. Economy Energy & Environment in textile Wet Processing - ACT, Edited by S.S. Trivedi.
2. Environmental Issues - Technology option for Textile Industry Edited by R. B. Chavan, Indian Journal of Fibre & Textile Research Special Issue - March, 2001.
3. Eco-friendly Textiles Challenges to Textile Industry - Textile Committee.
4. Environmental Success - America Textile Industry, AATCC Symposium - 1996.
5. The Textile Industry: Achieving Our Environmental Commitment - AATCC Symposium - 1994.
6. Textile Energy & Waste Seminar-Textile Institute, 1997.

7. The Management Systems - Quality, Environment, Health & Safety ISO 9001 : 2000, ISO 14001, OHSAS 18001 BY Pranab Kr. Nag, International Certification Services.
8. Water Supplies of the Treatment and Disposal of Effluents by A.H. Little, Textile Institute Monograph series.
9. Handbook of Environments, health & safety by Herman Koren & Michael Biseri
10. Ecology and textiles by Dr. V.A. Shenai
11. Azo dyes - facts & figures by Dr. V.A. Shenai
12. Environmental issues - Technology options for textile industry - book of papers edited by Dr. R.B. Chavan
13. Eco-friendly textiles, challenges to the textile industry - Book of papers by Textile Committee.
14. Guidance for the manufacture of eco-friendly textiles- Book of papers by Textile committee.
15. Eco-friendly textiles - book of papers edited by Prof. M.L. Gulrajani
16. Dyeing & Printing with natural dyes - NCUTE workshop book NT, Delhi.
17. Convention on natural dyes - Book of papers I IT, Delhi
18. Dyeing of wool & silk by Prof. M.L. Gulrajani

<b>Code &amp; Title of the Course</b>	<b>TXT 2213</b> <b>Continuous Processing of Textiles</b>
<b>Marks</b>	50
<b>Number of Hours per Week</b>	2+1
<b>Credits</b>	2
<b>Class</b>	M Sc (Textile Processing)
<b>Semester</b>	III

<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Continuous pretreatment of textiles-Processes & Machinery	7
2	Combined pretreatment of different textiles.	5
3.	Continuous dyeing of natural & synthetic and blended fabrics-various dyeing processes.	7
4.	Different classes of dyes used, dyeing machinery.	6
5.	Recent advances in continuous processing.	5

### **Text / reference books**

1. Handbook of Textile Processing Machinery by R.S. Bhagwat.

<b>Code &amp; Title of the Course</b>		<b>TXP 2012 Seminar</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		4
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		III
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Students will be required to prepare review of selected topic in Chemical Technology and Allied subjects and submit in the form of standard typed report. The students will also be required to make an oral presentation of the review	50

<b>Code &amp; Title of the Course</b>		<b>TXP 2013: Printing Lab</b>
<b>Marks</b>		50
<b>Number of Hours per Week</b>		4
<b>Credits</b>		2
<b>Class</b>		M Sc (Textile Processing)
<b>Semester</b>		III
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Direct style of printing of Reactive Dyes on cotton.	4
2	Direct style of printing of Vat Dyes on cotton.	4
3.	Direct style of printing of Azoic colours on cotton.	4
4.	Direct style printing on Polyester/nylon with Disperse dyes.	8
5.	Direct style printing on Nylon Acid and Direct dyes.	4
6.	Direct style printing on Wool with Acid and Direct dyes.	4
7.	Direct style of printing of Pigments on cotton and polyester.	4
8.	Discharge style of printing – white discharge under Reactive dyed ground.	4
9.	Discharge style of printing – white and yellow discharge under azoic ground.	4
10.	Discharge style of printing – Vat discharge under direct dyed ground.	4
11.	Discharge style of printing – pigment under reactive dyed ground.	4
12.	Resist style of printing – White resist under reactive dyed ground.	4
13.	Special print effect – Tie and Dye style, Batik, brasso etc.	8

<b>Code &amp; Title of the Course</b>		<b>TXP 2014</b>
		<b>Finishing Lab</b>
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	4	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	III	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Application of cross linking agent and testing of finished fabric for crease recovery angle, tensile and tear strength.	8
2	Application of antistatic agent and testing of finished fabric for static charge.	4
3.	Application of flame retarding agent and testing of finished fabric by measurement of char length, rate of burning and Limiting Oxygen Index.	4
4.	Application of softeners and testing of finished fabric for its feel, drapability, effect on absorbency, yellowing, shade change, sewability testing, Handlometer /surface friction assessment.	8
5.	Application of water repellent/waterproof agent and evaluation of fabric for water repellency by spray/shower test and water penetration test.	8
6.	Application of Optical brightening agent and evaluation of fabric for its whiteness.	4
7.	Application of stiffening agent and evaluation of fabric for its feel and bending	4
8.	Application of antibacterial agents and testing of finished fabric for antibacterial	12
9.	Application of soil release agent and testing of finished fabric for anti-soiling	4
10.	Application of Water and Oil repellent and its evaluation.	4

<b>Code &amp; Title of the Course</b>		<b>TXP 2015</b>
		<b>Fastness Lab</b>
<b>Marks</b>	50	
<b>Number of Hours per Week</b>	4	
<b>Credits</b>	2	
<b>Class</b>	M Sc (Textile Processing)	
<b>Semester</b>	III	
<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1..	Determination of colour fastness to various agencies like washing, light and rubbing.	16
2	Determination of colour fastness to perspiration.	4
3.	Determination of colour fastness to sublimation and hot pressing.	4
4.	Evaluation of colour fastness to Bleach with hypochlorite and peroxide.	8

5.	Determination of the Fabric strength and elongation at break.	4
6.	Determination of bursting strength of a fabrics .	4
7.	Determination of abrasion resistance of a fabrics.	4
8.	Determination of Tear strength of a fabrics .	4
9.	Determination of pilling resistance of fabric.	4
10.	Determination of Seam strength and Yarn Slippage.	4
11.	Determination of Stitch strength.	4

<b>Code &amp; Title of the Course</b>	<b>TXP 2023</b> <b>Project III</b>
<b>Marks</b>	50
<b>Number of Hours per Week</b>	6
<b>Credits</b>	2
<b>Class</b>	M Sc (Textile Processing)
<b>Semester</b>	III

<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1	This would be concerned with the continuation of the research project executed in the first semester and the exact work plan will be decided in consultation with the research guide. At the end of the project, the candidate is expected to submit a report e which will be evaluated by the research guide and an external examiner from the Department/Industry based on the presentation made by the candidate. A suitable combination of the marks for report and presentation will be considered for the final evaluation.	50

#### SEMESTER IV

<b>Code &amp; Title of the Course</b>	<b>TXP 2016</b> <b>Factory Training and Report submission</b>
<b>Marks</b>	200
<b>Number Weeks</b>	15
<b>Credits</b>	8
<b>Class</b>	M Sc (Textile Processing)
<b>Semester</b>	IV

<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
---------------	--------------	-------------

1.	Students will be sent for factory training in the Textile processing industry and allied sector for 15 weeks training. Students are required to submit Certificate of completion of training from relevant authority from the industry where they have been sent along with report of the day to day activities at the training place. The students will also be required to make an oral presentation of the training report.	720
----	--	-----

<b>Code &amp; Title of the Course</b>	<b>TXP 2024</b> <b>Project Presentation and Thesis Submission</b>
<b>Marks</b>	100
<b>Number Weeks</b>	01
<b>Credits</b>	4
<b>Class</b>	M Sc (Textile Processing)
<b>Semester</b>	IV

<b>Sr.No.</b>	<b>Topic</b>	<b>Hrs.</b>
1.	Student should submit the synopsis, face open defense and submit final copy of the thesis.	40