VEER NARMAD SOUTH GUJARAT UNIVERSITY

B. E. III

(6TH Semester)

Textile Processing

Sr. No.	Courses	Course No.	Teaching Scheme L	T	P
1.	Technology Of Printing - I	TP - 601	3	1	2
2.	Technology Of Dyeing - II	TP - 602	3	1	2
3.	Analytical Textile Chemistry - I	TP - 603	3	1	3
4.	Chemical Engineering & Reaction Kinetic	TP - 604	3	1	-
5.	Textile Testing - I	TT - 605	3	-	4
			15	**4**	**11**

Total teaching scheme is of 30 hours

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Scheme of Teaching and Examination BE II (6TH Semester) Textile Processing

Course	Course No.	Teaching Schedule			Examination Scheme						Grand Total Marks
					Theory Exam		Practical/Quiz/Viva Examination				
		Theory	Tutorial	Practical	Duration hours	Marks	Sem. End Exam	Tutorial Evaluation	Cont. Int. Evaluation	Total 8+9+10	7+11
1	2	3	4	5	6	7	8	9	10	11	12
Technology Of Printing - I	TP - 601	3	1	2	3	100	30	-	20	50	150
Technology Of Dyeing - II	TP - 602	3	1	2	3	100	30	-	20	50	150
Analytical Textile Chemistry - I	TP - 603	3	1	3	3	100	30	-	20	50	150
Chemical Engineering & Reaction Kinetic	TP - 604	3	1	-	3	100	-	-	-	-	100
Textile Testing - I	TT - 605	3	-	4	3	100	30	-	20	50	150
TOTAL		**15**	**4**	**11**		**500**	**120**	**-**	**80**	**200**	**700**

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B. E. III (TEXTILE PROCESSING) Semester - VI
TP - 601, TECHNOLOGY OF PRINTING - I

Teaching Scheme (No. Of Contact hr.)			Theory Exam		Practical/Quiz/Viva Exam		Grand Total
			Duration (hr.)	Marks	Sem. End Exam	Cont. Int. Evaluation	
Theory	Tut.	Pract.					
3	1	2	3	100	30	20	150

Theory

1. **Introduction :** Necessity of defination of printing
   Various stages involved in printing
2. **Preparation Of Fabric For Printing - Importance Of Preparation :**
   * Stitching, Shearing/Cropping, Singeing, Desizing, Scouring, Mercerising, Bleaching, Optical Brightening, Stentering, etc.
3. **Equipments And Methods Used For Block, Stencil & Roller Printing :**
   * Engraving of Wooden Process
   * Stencil cutting process
   * Methods of block & stencil printing
   * Engraving of copper rollers
   * Construction & Working of roller printing machine
   * Design setting mechanism in roller printing machine
4. **Preparation Of Print Paste & Thickening Agents :**
   * Selection of dyes for print paste
   * Formulation & properties of printing paste
   * Classification, properties & functions of thickeners
   * Selection of suitable thickeners
   * Merits & demerits of various thickening agents
5. **Styles Of Printing :**
   * Various styles of printing : Direct style, Dyes style, Raised style, Azoic style, Resist style, Discharge style, Batik style, Crimp style, Brasso style, etc.
6. **Direct Style Of Printing :**
   * Printing of Cotton/Viscose fabric with Direct, Basic, Vat, Indigosol, Aniline Black, Reactive & Pigment Dyes.
   * Printing of Wool & Silk with appropriate Dyes.
7. **Methods Of Fixation :**
   * Necessity of dye fixation
   * Machines like Steamer, Ager, Polymeriser, etc. For fixation of dyes. Neat sketch & working.

Practicals

This shall be based on prescribed syllabi.

Term work

This shall consist of records of practical work done during practical & recorded in the journal.

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B. E. III (TEXTILE PROCESSING) Semester - VI
TP - 602, TECHNOLOGY OF DYEING - II

Teaching Scheme (No. Of Contact hr.)			Theory Exam		Practical/Quiz/Viva Exam		Grand Total
			Duration (hr.)	Marks	Sem. End Exam	Cont. Int. Evaluation	
Theory	Tut.	Pract.					
3	1	2	3	100	30	20	150

Theory

1. Materials used for construction of dyeing machines
2. **Machines Used For Fabric Dyeing :**
   a. Padding Mangles
   b. Continuous Dyeing Machine
   c. Machine used for dye fixation e.g. Hot flue.
3. Application, mechanism & properties of Vat, Indigosol, Sulphur, Azoic, Reactive & Pigment Dyes. After treatments of Sulphur, Azoic & Reactive Dyes.
4. **Development in Dyeing Such as :**
   a. Solvent Dyeing
   b. Space Dyeing
   c. Foam Dyeing
5. Faults in dyeing, Their rectification & prevention in above dyeing methods.
6. Sizing & Dyeing of yarn for Denim Fabrics, Finishing of Denim Fabrics.
7. Nature Of Dye: Vander Walls Force, H-bonding, ionic and covalent bonds
8. **Theory of Dyeing**

   Purification of dyes, Methods of estimation of dye on fibre and in solution, Study of Heat of dyeing using various dye-fibre system such as Direct, Vat, Reactive Dyes on Cellulose, Acid Dyes on Nylon, Wool & Silk, Cationic Dyes on CDPET and Acrylics, Study the affinity of dyes for water and fibres such as cellulosic, Proteins/Polyamides, Polyester, Partition ratio for disperse dye on Polyester. Rate of dyeing of ionic and nonionic dyes on Cellulose, Protein & Synthetic fibres. Effect of fibre structure, chemical and physical such as drawing, heat setting, denier, twist, effect of -OH, -COOH, -NH2 etc., group on dyeing, diffusion of dyes, determination of dyes, determination of diffusion coefficient of disperse dyes on polyester.
9. Compatibility of dyes on different groups on fibres e.g. Acid dyes on Nylon, Direct dyes on Cotton, Disperse Dyes on Polyester and Cationic Dyes on CDPET fibres.

Practicals

This shall be based on prescribed syllabi.

Term work

This shall consist of records of practical work done during practical & recorded in the journal.

B. E. III (TEXTILE PROCESSING) Semester - VI

TP - 603, ANALYTICAL TEXTILE CHEMISTRY - II

Teaching Scheme (No. Of Contact hr.)			Theory Exam		Practical/Quiz/Viva Exam		Grand Total
			Duration (hr.)	Marks	Sem. End Exam	Cont. Int. Evaluation	
Theory	Tut.	Pract.					
3	1	3	3	100	30	20	150

Theory

1. Analysis of Desizing agents, Scouring agents and Bleaching agents.
2. Analysis of chemicals such as Acids, Alkalis, Oxidising agents, Reducing agents and their effects on various fibres.
3. Test methods for absorbency, Whiteness and Whiteness retention
4. Test methods for Copper number, Cuprammonium fluidity, Barium Activity number, Luster number.
5. Analysis of Dyeing Assistants, Printing gums and other Auxiliaries.
6. Identification & Analysis of various finishing agents.
7. Analysis of finished material for % add on, Nitrogen and Phosphorous content, Formaldehyde content, Chlorine retention, Soil release, Soil redeposition, Water proofing, Flame Retardancy, etc.
8. Evaluation of different fastness properties.

Practical

This shall be based on prescribed syllabi.

Term work

This shall consist of records of practical work done during practical & recorded in the journal.

References :-

01.	Evaluation Of Textile Chemicals	SHENAI V. A.
02.	Process House Laboratory - A Hand Book	LUTHRA
03.	Treatment Of Textile Processing Effluents Including Analysis	Manivasakam

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B. E. III (TEXTILE PROCESSING) Semester - VI

TP - 604, CHEMICAL ENGINEERING & REACTION KINETIC

Teaching Scheme (No. Of Contact hr.)			Theory Exam		Practical/Quiz/Viva Exam		Grand Total
			Duration (hr.)	Marks	Sem. End Exam	Cont. Int. Evaluation	
Theory	Tut.	Pract.					
3	1	-	3	100	-	-	100

Theory

1. **Chemical Engineering :**
   Fluid mechanics, Fluid statics, Bernoulli Theorem, Continuity equation and momentum equation, Friction in pipes, Pressure losses. The measurement of velocities using the orifice plate, the venturi meter, variable-area meters, weirs, notches. Methods of measurements of viscosity. Introduction to Stoke's Law.
   Dimensional analysis. Reynolds number, laminar and turbulent flow, Poiseuille's equation, friction factors and simple pressure drop calculation. Pumps, design and selection of pipe work and pumping systems for a chemical plant.
   The analogies between momentum heat and mass transfer. The flow of fluid through beds of solids. The pressure drop over packed bed and theory of filtration at constant flow or constant pressure.
2. Reaction kinetics, extension of the Collision Theory and transmission state theory of absolute reaction rates. Concept of Entropy of activation. Chain reactions : consecutive and concurrent reaction : unstable intermediates (thermal, photochemical and radiation induced reactors).
   Homogeneous Catalysis : Heterogeneous reactions and catalysis. The study of fast reactions by current techniques. Application of thermodynamic and reaction kinetics to industrial processes : batch and continuous reactors.
3. Phase Equilibrium. Conditions for equilibrium between phases two component systems : generalised treatment of miscible, partially miscible and immiscible systems (both liquid vapour and liquid/solid equilibria). Processes involving phase separation : distillation, zone refining, liquid-liquid extraction. Three component system of two salts and water : crystallization problems.

References :-

01.	Chemical Reaction Kinetic	Octave & Levenspiel
02.	Introduction To Chemical Engineering	Chatto Padhyay
03.	Unit Operation To Chemical Engineering	McCabe & Smith
04.	Chemical Engineer Vol. I, II, III	J. M. Coulson, J. F. Richarleson
05.	Introduction in Chemical Engineering	Badger and Banchero
06.	Stoichiometry	B. I. Bhatt, S. M. Vora

TP - 605, TEXTILE TESTING - I

Teaching Scheme (No. Of Contact hr.)			Theory Exam		Practical/Quiz/Viva Exam		Grand Total
			Duration (hr.)	Marks	Sem. End Exam	Cont. Int. Evaluation	
Theory	Tut.	Pract.					
3	-	4	3	100	30	20	150

Theory

1. Aim and scope of testing. Introduction to textile testing, sample and sorting of fibres. The estimation of population characteristics from samples and the use of confidence intervals. Determination of number of tests to be carried out to give choosen degree of accuracy. Significance testing of means, quality control chart and their interpretation.
2. Measurement of length, fineness and crimp of fibres.
3. Determination of foreign matter, maturity, moisture regain, moisture content of fibres.
4. Fibre Identification.
5. Measurement of twist, count, Hairiness of yarn, yarn numbering systems and conversions.

Practical

This shall be based on prescribed syllabi.

Term work

This shall consist of records of practical work done during practical & recorded in the journal.

References :-

01.	Principles Of Textile Testing	Booth J.E.
02.	Textile Testing	Angappan
03.	Hand Book Of Textile Testing & Quality Control	Grover