

FACULTY OF SCIENCES

SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

B. TECH. (TEXTILE PROCESSING TECHNOLOGY) **(Credit Based Evaluation and Grading System)** **(SEMESTER: I-VIII)**

Examination : 2020-24



GURU NANAK DEV UNIVERSITY **AMRITSAR**

Note:

- 1) **Copy rights are reserved.**
No body is allowed to print it in any form.
Defaulters will be prosecuted.
- 2) **Subject to change in the syllabi at any time.**
Please visit the University website time to time

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER SYSTEM)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

**SCHEME
SEMESTER –I**

S. No.	Course Code	Course Title	L	T	P	Credits
1.	CYL197	Engineering Chemistry	3	0	1	4
2.	MTL101	Mathematics-I	3	1	0	4
3.	ECL119	Basic Electrical & Electronics Engineering	4	0	1	5
4.	CSL126	Fundamentals of IT & Programming using Python	2	1	1	4
5.	ENL101	Communicative English-I	2	0	0	2
6.		Elective-I	2	0	0	2
7.	MEP101	Workshop Practices	0	0	2	2
8.	SOA 101	Drug Abuse: Problem, Management and Prevention (Compulsory ID)	2	0	0	2
List of Electives–I:						
1.	PBL121	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ-I OR	2	0	0	2
2.	PBL122*	ਮੁੱਢਲੀ ਪੰਜਾਬੀ-I OR	2	0	0	
3.	HSL101*	Punjab History & Culture (1450-1716)	2	0	0	
Total Credits:			18	2	5	25

***Special Note:**

- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile/Non-Domicile of Punjab** ਹਨ ਅਤੇ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ) ਪੜ੍ਹਨਗੇ।
- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Non-Domicile of Punjab** ਹਨ ਅਤੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਜਾਂ ਪੰਜਾਬ ਹਿਸਟਰੀ ਐਂਡ ਕਲਚਰ ਵਿੱਚੋਂ ਕੋਈ ਇੱਕ ਵਿਸ਼ਾ ਚੁਣ ਸਕਦੇ ਹਨ।
- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile of Punjab** ਹਨ, ਪੰਤੂ ਕਿਸੇ ਕਾਰਣ ਪੰਜਾਬ ਤੋਂ ਬਾਹਰ ਪੜ੍ਹੇ ਹਨ ਅਤੇ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦਾ ਹੀ ਵਿਸ਼ਾ ਪੜ੍ਹਣਗੇ।
- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile of Punjab** ਹਨ ਅਤੇ ਪੰਜਾਬ ਦੇ ਕੇਂਦਰੀ ਵਿਦਿਆਲਿਆ ਜਾਂ ਕਿਸੇ ਹੋਰ ਸਕੂਲ ਵਿੱਚ ਪੜ੍ਹੇ ਹਨ ਅਤੇ ਕਿਸੇ ਕਾਰਣ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦਾ ਵਿਸ਼ਾ ਹੀ ਪੜ੍ਹਣਗੇ।

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER SYSTEM)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SEMESTER –II

S. No.	Course Code	Course Title	L	T	P	Credits
1.	CEL120	Engineering Mechanics	3	1	0	4
2.	MEL120	Engineering Graphics & Drafting	2	0	2	4
3.	MTL102	Mathematics-II	3	1	0	4
4.	PHL183	Physics	3	1	1	5
5.	MEL110	Introduction to Engg. Materials	3	0	0	3
6.		Elective-II	2	0	0	2
7.	PSL 055	Human Rights and Constitutional Duties (Compulsory ID)	2	0	0	2
List of Electives–II:						
1.	PBL131	ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ-II OR	2	0	0	2
2.	PBL132*	ਮੁੱਢਲੀ ਪੰਜਾਬੀ-II OR	2	0	0	
3.	HSL102*	Punjab History & Culture (1717-1947) OR	2	0	0	
Total Credits:			18	3	3	24

***Special Note:**

- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile/Non-Domicile of Punjab** ਹਨ ਅਤੇ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ (ਲਾਜ਼ਮੀ) ਪੜ੍ਹਨਗੇ।
- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Non-Domicile of Punjab** ਹਨ ਅਤੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਜਾਂ ਪੰਜਾਬ ਹਿਸਟਰੀ ਐਂਡ ਕਲਚਰ ਵਿੱਚੋਂ ਕੋਈ ਇੱਕ ਵਿਸ਼ਾ ਚੁਣ ਸਕਦੇ ਹਨ।
- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile of Punjab** ਹਨ, ਪੰਤੂ ਕਿਸੇ ਕਾਰਣ ਪੰਜਾਬ ਤੋਂ ਬਾਹਰ ਪੜ੍ਹੇ ਹਨ ਅਤੇ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦਾ ਹੀ ਵਿਸ਼ਾ ਪੜ੍ਹਣਗੇ।
- ਜਿਹੜੇ ਵਿਦਿਆਰਥੀ **Domicile of Punjab** ਹਨ ਅਤੇ ਪੰਜਾਬ ਦੇ ਕੇਂਦਰੀ ਵਿਦਿਆਲਿਆ ਜਾਂ ਕਿਸੇ ਹੋਰ ਸਕੂਲ ਵਿੱਚ ਪੜ੍ਹੇ ਹਨ ਅਤੇ ਕਿਸੇ ਕਾਰਣ ਉਨ੍ਹਾਂ ਨੇ ਅੱਠਵੀਂ/ਦਸਵੀਂ ਜਮਾਤ ਤੱਕ ਪੰਜਾਬੀ ਵਿਸ਼ਾ ਨਹੀਂ ਪੜ੍ਹਿਆ ਹੈ, ਉਹ ਮੁੱਢਲੀ ਪੰਜਾਬੀ ਦਾ ਵਿਸ਼ਾ ਹੀ ਪੜ੍ਹਣਗੇ।

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER SYSTEM)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

THIRD SEMESTER

Course code	Subject	L	T	P	Credits
TCL-201	Pretreatment Technology-I	3	0	0	3
TCL-202	Color Science	3	0	0	3
TCL-203	Textile Fibres	3	0	0	3
TCL-204	Textile testing-1	3	0	0	3
TCL-205	Dyeing Machines	2	0	0	2
ESL-220	Environmental Studies (Compulsory ID)	2	0	0	2
List of Practicals					
TCP-201	Pretreatment Lab	0	0	3	3
TCP-202	Computer Color Matching Lab	0	0	3	3
TCP-203	Textile Chemical Testing Lab-I	0	0	2	2
Total Credits		16	0	8	24

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER SYSTEM)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

FOURTH SEMESTER

Course code	Subject	L	T	P	Credits
TCL-206	Pretreatment Technology-II	3	0	0	3
TCL-207	Manufactured Fibre technology	3	0	0	3
TCL-208	Introduction to yarn manufacture	3	0	0	3
TCL-209	Natural fiber and fabric dyeing	3	0	0	3
Department Elective courses (select any one out of TCL-210 or TCL-211) DE-I					
<i>TCL-210</i>	<i>Textile and Fashion Design</i>	3	0	0	3
<i>TCL-211</i>	<i>Sociological and Psychological Aspects of Clothing</i>	3	0	0	3
ID-1	Interdisciplinary Course (drug abuse)	2	0	0	2
List of Practicals					
TCP-204	Natural Fiber and Fabric Dyeing Lab	0	0	3	3
TCP-205	Textile Physical Testing Lab	0	0	3	3
TCP-206	Textile Chemical Testing Lab-II	0	0	2	2
*TCP-207	Summer Training (6 Weeks)	0	0	1	1
Total Credits		17	0	9	26
<p>*The students should undergo summer training at the end of 4th Semester. The result will be satisfactory (S) or unsatisfactory (U).</p>					

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER SYSTEM)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

FIFTH SEMESTER

Course code	Subject	L	T	P	Credits
TCL-301	Synthetic Dyeing Technology	3	0	0	3
TCL-302	Textile Testing-II	3	0	0	3
TCL-303	Introduction to fabric manufacture	3	0	0	3
TCL-304	Printing Technology-I	3	0	0	3
TCL-305	Finishing Technology-I	3	0	0	3
ID-2	Human Rights and Constitutional Duties (Compulsory ID)	2	0	0	2
List of Practicals					
TCP-301	Synthetic Dyeing Lab	0	0	3	3
TCP-302	Printing Lab	0	0	3	3
Total Credits		18	0	6	24

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER SYSTEM)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SIXTH SEMESTER

Course code	Subject	L	T	P	Credits
TCL-306	Processing of blends	3	0	0	3
TCL-307	Printing Technology-II	3	0	0	3
TCL-308	Apparel production	3	0	0	3
TCL-309	Finishing Technology-II	3	0	0	3
TCL-310	Fashion Retailing, Marketing and Merchandising	3	0	0	3
Department Elective courses (select any one out of TCL-311 or TCL-312) DE-II					
<i>TCL-311</i>	<i>Green processing of Textiles</i>	3	0	0	3
<i>TCL-312</i>	<i>Technical Textiles</i>	3	0	0	3
List of Practicals					
TCP-303	Finishing Lab	0	0	3	3
TCP-304	Blend Processing Lab	0	0	3	3
**TCP-305	Industrial Training (6 weeks)	0	0	4	4
Total Credits		18	0	10	28
<p>**The students should undergo 6 weeks industrial training at the end of 6th Semester. The industrial training will be evaluated in the form of training report and Power point presentation.</p>					

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER SYSTEM)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SEVENTH SEMESTER

Course code	Subject	L	T	P	Credits
TCL-401	Human Resource Management	3	0	0	3
TCL-402	Waste Management and Pollution control in Textile Industry	3	0	0	3
TCL-403	Garment Processing Technology	3	0	0	3
TCL-404	Quality Control in Textiles	3	0	0	3
List of Practicals					
TCP-401	Seminar	0	0	2	2
TCP-402	Research Project	0	0	6	6
Total Credits		12	0	8	20

EIGHTH SEMESTER

Course code	Subject	L	T	P	Credits
***TCP-403	Industrial Training (6 Months)	0	0	20	20
Total Credits		0	0	20	20

*****The students should undergo 6 months industrial training at the end of 7th Semester. The industrial training will be evaluated in the form of training report and Power point presentation.**

Training report will be submitted within one week after completion of training.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Engineering Chemistry
Course Code	:	CYL-197
Credits (L-T-P)	:	4 (3-0-1)
Total Marks	:	100
Mid Semester Examination	:	20% weightage
End Semester Examination	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:

At the end of this course, the student should be able to understand the water quality requirement for human consumption, different treatment process for municipal water treatment, application of glass, ceramics, composites, magnetic materials, Role of refractories for synthesis of high performance materials. Polymer, rubber and silicone material uses in daily life. Introduction to electrochemistry. Application of CNT and graphene in electronics industry.

Total No. of Lectures –45

Lecture wise breakup		Number of lectures
SECTION - A		
1	Water hardness: Common impurities of water, Hardness: Introduction, EDTA method for determination of hardness, degree of hardness. Numerical based on hardness and EDTA method.	4
2	Water hardness related problems: Boiler troubles, their causes, disadvantages and prevention: Formation of solids (scale and sludge), carry over (priming and foaming), corrosion and caustic embrittlement.	2
3	Water treatment techniques: Introduction, water purification techniques, steps involved in purification of water, sedimentation, coagulation, filtration and sterilization, chlorination.	3
4	Softening of water: Lime-Soda method, Zeolite method, Deionization/Demin-eralization methods. Numerical problems based on Lime-Soda and Zeolite softening methods.	3

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION - B		
5	Glasses, Ceramics, Composites Glassy state, glass formers and modifiers, types of glasses, manufacturing, applications. Ceramic structures, types of ceramics and their properties. Composites; types, properties and applications.	6
6	Magnetic Materials: Introduction, types of magnetic material, hard and soft ferrites, magnetic properties and applications.	3
7	Refractories: Definition, classification, properties, requisites of good refractory, manufacturing of refractory, silica and fire clay refractory and their uses. Seger's (Pyrometric) Cone Test and RUL Test.	3
SECTION - C		
8	Polymers: Introduction, classification and constituents of polymers, polymer structure and properties, glass transition temperature (T_g), melting point (T_m), structure-property relations (general), synthesis, properties and application of commercial polymers (Bakelite, Polyethylene, Polypropylene, Polystyrene, Polycarbonate, Polytetrafluoroethylene, Polyester and Nylon)	6
9	Polymer processing methods: Introduction, compounding, moulding (Injection, Compression, Blow film and Extrusion). Application of polymers such as contact lenses, bulletproof vest, etc.	3
10	Rubber: Introduction, natural rubber, vulcanization, different types of rubber, synthesis of rubbers viz. Buna-S, Buna-N, Butyl and neoprene rubbers, properties and application.	3
SECTION - D		
12	Silicone based compounds: Introduction, properties, preparation of silicones, cross-linked silicones, silicon fluids or oils, silicon elastomers and their applications.	2
13	Electrochemistry: Introduction, Strong, moderate and weak electrolytes, degree of ionization, factors affecting degree of ionization, Arrhenius theory of ionization, specific conductance, molar conductance, Faraday's Law of electrolysis, Chemical cells, distinguish between electrolytic and galvanic cell, reversible and irreversible cells with examples. Standard electrode (reduction) potential of half-cells. Applications of electrochemistry in daily life.	4
14	Nanomaterial: Introduction, properties, general methods of preparation. Applications of fullerenes, CNTs and graphene.	3

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

List of Practicals:

1. Determination of total hardness of Water.
2. Determination of temporary and permanent hardness of water.
3. To determine the strength of sodium carbonate in given sample of washing soda.
4. To determine the strength of sodium carbonate and sodium hydroxide in caustic soda solution.
5. To determine the strength of acetic acid in vinegar
6. Find the strength of KMnO_4 solution with oxalic acid
7. Find the strength of KMnO_4 solution with Mohr's salt.
8. To determine the number of water molecules in Mohr's salt by titration method.
9. Determination of relative viscosity of a given liquid with respect to water by viscometer.
10. Determination of surface tension of a given liquid by drop number method by stalagmometer.
11. To determine the strength of strong and weak acid conductometry
12. To determine the critical micelle concentration of a soap (sodium laurate) by surface tension measurements.

Course Outcomes:	
1	Develop new methods to produce soft water for industrial use and potable water at low cost.
2	Replace metals with polymer in different application areas.
3	Develop low cost and new methods for synthesis of Nano materials.
4	Apply their knowledge for development of new application of electrochemistry.
5	Demonstrate the knowledge of polymer materials for advance engineering applications.

Suggested / ReferenceBooks:	
1	Engineering Chemistry by P.C. Jain & Monica Jain Dhanpat Rai Publishers, NewDelhi.2014.
2	Physical Chemistry by A. Peter and J.de. Paula 10th Edition Oxford University Press, 2014.
3	Inorganic Polymers by P.B. Saxena, Discovery Publishing House, 2007.
4	Ferrite materials by V.R.K. Murthy & B. Viswanathan, SpringerVerlag, Berlin, 1990
5	Advanced practical physical chemistry by J.B Yadav by Krishna's educational publishers.

E-learning resource: <https://nptel.ac.in/courses.php>

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Mathematics-I
Course Code	:	MTL-101
Credits (L-T-P)	:	4 (3-1-0)
Total Marks	:	100
Mid Semester	:	20% weightage
End Semester	:	80% weightage

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:

The aim of the course is to introduce the important topics of mathematics to future engineers which they would find useful in their respective engineering branches. This course would act as foundation for the students with basic as well as advanced concepts for familiarizing them with the use of mathematics to the real life and problems associated with their respective disciplines.

Total No. of Lectures – 44

Lecture wise breakup		Number of Lecture
SECTION - A		
1	Matrices: Introduction to matrices, Inverse and rank of a matrix, rank-nullity theorem; Symmetric, skew-symmetric and orthogonal matrices, Hermitian and skew-Hermitian matrices, Unitary matrix, Determinants; System of linear equations; Eigenvalues and eigenvectors; Diagonalization of matrices; Cayley-Hamilton Theorem.	10
SECTION - B		
2	Infinite Series: Convergence and divergence of infinite series, Geometric series test, Positive term series, p-series test, [Comparison test, D' Alembert's ratio test, Cauchy's root test, Integral test, Raabe's test, Logarithmic test, Gauss's test] (without proofs), Alternating series and Leibnitz's rule, Power series, Radius and interval of convergence.	10

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION - C		
3	Differential Calculus: Partial Derivatives, Euler's theorem on homogeneous functions, Maclaurin's and Taylor's expansions of single and two variables, Maxima and minima of functions of several variables, Lagrangian method of multipliers, Multiple integrals and their use in obtaining surface areas and volumes of solids.	12
SECTION - D		
4	Vector Calculus: Scalar and Vector point functions, Differentiation of vectors, Gradient of a scalar field, Divergence and Curl of a vector field, Line integral of a vector field, Surface integral of vector field, Volume integral of a scalar field, Green's theorem, Stokes theorem, Gauss divergence theorem (without proofs) and their applications.	12

Course Outcomes:	
1	Students will be able to calculate rank of matrix, characteristic equation & characteristic roots & use the applicability of Cayley Hamilton Theorem to find inverse of matrix which is very important in many engineering application.
2	It will equipped the students in determining whether the given function can be approximated with the power series.
3	Students will learn the various applications of mathematics using vector calculus techniques.

Suggested / Reference Books:	
1	Kreyszig: Engineering Mathematics, Wiley Eastern Ltd.
2	B.S. Grewal: Higher Engineering Mathematics, Khanna Publisher, New Delhi.
3	Louis A. Pipes: Applied Mathematics for Engineers and Physicists, McGraw Hill Book

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Basic Electrical & Electronics Engineering
Course Code	:	ECL-119
Credits (L-T-P)	:	5 (4-0-1)
Total Marks	:	100
Mid Semester Examination	:	20% weightage
End Semester Examination	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
This course is aimed to introduce important initial understanding of electrical and electronics engineering to the 1st year students, this will act as the foundation for the advanced electronics courses. The aim of this course is to familiarize the students to the basics of electricity, electrical machines and the basics of electronic devices. so that they can use this knowledge in relevant applications.

Total No. of Lectures –48

Lecture wise breakup		Number of Lectures
SECTION – A		
1	<p>Electricity and power supply: Features of the power supply system, power station, transmission, distribution lines, difference between AC and DC, voltage, current and resistance, concept of electromagnetic induction and production of alternating e.m.f - single phase and 3 phase, 3-phase star and delta connections, voltage and current relations.</p> <p>Electrical Machinery: Transformer, its working principle, types of transformers and their applications, performance losses, efficiency and voltage regulation, open circuit and short circuit tests on transformer, auto transformers.</p>	12

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION – B		
2	<p>Circuit Analysis: A brief review of DC and single phase AC circuits. , Star-delta load transformation, concept of balanced and unbalanced three phase circuits, measurement of power and power factor in three phase balanced circuits.</p> <p>Semiconductors: Introduction to semiconductors, Intrinsic Semiconductor, n-type and p-type semiconductors, Effect of Doping, Fermi levels, Charge flow in semiconductors.</p>	12
SECTION – C		
3	<p>PN junction diode: Theory of PN junction diode, depletion layer, barrier potential, Volt-Ampere Characteristics, Current Components, Storage Capacitance and transition capacitance, Junction diode switching times, Zener diode, LED, Photodiode, Varactor diode, Schottky diode</p> <p>Bipolar Junction Transistors: Junction Transistor, Current components, transistor as an amplifier, CB, CE and CC configurations and characteristics.</p>	12
SECTION – D		
4	<p>Fundamentals of DC & AC Motors: Working principle, construction, types & characteristics of DC motor, Working principle of Single-Phase & Three-Phase Induction motor, Three phase synchronous motor.</p> <p>Control and Protection: Control mechanism, principle and applications of protection devices: Fuses, MCB, LCB, relays. Need& types of earthing and grounding, Cables, Construction of LT & HT cables.</p>	12

Course Outcomes: After study of this subject the student will become	
1	Familiar with the electricity production, distribution and the use of control/protection devices.
2	Able to understand the working and applications of electrical machines.
3	Able to understand the basics of semiconductor devices and their applications.
4	Familiar to the concept of rectification and filtration circuits.
5	Able to analyze the basic DC and AC circuits and to solve related circuit problems.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Suggested / ReferenceBooks:	
1	Principles of Electrical Engineering by Gupta BR; S. Chand and Company, New Delhi.
2	Electrical Technology by Hughes Edward; The English Language Book Society and Longmans. Group Limited, London
3	Electrical Machines by Bhattacharya SK; Tata McGraw Hill, Delhi.
4	Basic Electrical Engineering by T.K. Nagarkar & Ms. Sakhija Seventh Edition 2008, Oxford University Press.
5	Electronic Devices and Circuit Theory, Boylestad R.L. VIII Edition, Pearson Education, 2008.
6	Electronic Fundamentals & Application, J.D. Ryder, PHI, 2006.
7	Experiments in Electrical Engineering by Bhatnagar US; Asia Publishing House, Bombay.

PRACTICAL:

1. Study of VI characteristics of PN junction
2. Study of Half wave, full wave & Bridge rectifiers.
3. Study of simple capacitive, T & II filters.
4. Study of zener as a voltage regulator.
5. Study of transistor characteristics in CC, CB and CE configuration
6. To study the performance characteristic of clipper circuit
7. To study the performance characteristic of clamper circuit

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Fundamentals of information technology and programming using python
Course Code	:	CSL 126
Credits (L-T-P)	:	4 (2-1-1)
Total Marks	:	100
Mid Semester Examination	:	20% weightage
End Semester Examination	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:

At the end of this course, the student should be able to understand the basics of computer as well as programming. The students are able to write programs. This course introduces computer programming using the Python programming language. Emphasis is placed on common algorithms and programming principles utilizing the standard library with Python.

Total No. of Lectures –

Lecture wise breakup		Number of Lectures
SECTION - A		
1	Block diagram of Computer, Associated peripherals, Memories – RAM, ROM, Secondary Storage Devices, Classification of Computers and Languages, Introduction to Compilers, Interpreter and Assemblers, Introduction of various operating system with their file system.	
SECTION - B		
2	Algorithm and Flowchart, Introduction to Python and Setting up the Python development environment, Basic syntax, interactive shell, editing, saving, and running a script, Concept of data types, Random number, Real numbers, immutable variables, Python console Input / Output. Arithmetic operators and expressions, Conditions, Comparison operators, Logical Operators, Is and In operators, Control statements: if-else, Nested If-Else, Loops (for, while)	
SECTION - C		
3	Built in function and modules in python, user defined functions, passing parameters, arguments and return values; formal vs actual arguments, Recursion, lists, Common List operations	

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION - D	
4	String Handling, Unicode strings, Strings Manipulation:-compare strings, concatenation of strings, Slicing strings in python, converting strings to numbers and vice versa. Strings and text files; manipulating files and directories, os and sys modules; text files: reading/writing text and numbers from/to a file; creating and reading a formatted file (csv or tab-separated).
Course Outcomes:	
1	Implement a given algorithm as a computer program in python language with the understanding of hardware components and memory utilization.
2	Able to use standard programming constructs: repetition, selection, functions, composition, modules and different data types
3	Adapt and combine standard algorithms to solve a given problem (includes numerical as well as non-numerical algorithms) and to debug the program written in python language

Suggested / Reference Books:	
1	Computers Today by Sanders.
2	Fundamentals of Computers TTTI Publication.
3	Learning Python by Mark Lutz, 5th edition
4	Python cookbook, by David Beazley , 3rd Edition
5	Python Essential Reference, by David Beazley , 4th edition
6	Python in a Nutshell, by Alex Mortelli, 2nd Edition.
7	Python programming: An Introduction to computer science, by John Zelle, 2nd Edition.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

ENL-101: COMMUNICATIVE ENGLISH –I

Credits: 2-0-0

Total Marks-100

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Objective: To introduce students to the skills and strategies of reading and writing by identifying organizational patterns, spotting classification systems and understanding associations between ideas. This course will prepare students to read a variety of texts and also to communicate more effectively through writing. The course will also pay special attention to vocabulary building.

Prescribed Text books:

- *The Written Word* by Vandana R. Singh, Oxford University Press, New Delhi.
- *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

SECTION–A

“Word List”, “Correct Usage of Commonly used words and Phrases” from the chapter “Vocabulary” given in *The Written Word* by Vandana R. Singh.

SECTION–B

Letter- writing as prescribed in *The Written Word* by Vandana R. Singh.
Report writing as prescribed in *The Written Word* by Vandana R. Singh.

SECTION–C

Section 1 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

SECTION–D

Section 2 from *Making Connections: A Strategic Approach to Academic Reading* by Kenneth J. Pakenham, Second Edition.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

CourseName	:	Workshop Practices
CourseCode	:	MEP-101
Credits (L-T-P)	:	2 (0-0-2)
Total Marks	:	100
Mid Semester Examination	:	20% weightage
End Semester Examination	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:

At the end of this course, the student should be able to understand the

1. Understand applications of hand tools and power tools.
2. Understand the operations of machine tools.
3. Select the appropriate tools required for specific operation.
4. 4. Comprehend the safety measures required to be taken while using the tools.

Total No. of Practicals – 48

Lecture wise breakup		Number of Practicals
SECTION - A		
1	Carpentry Shop: (a) Study of tools & operations and carpentry joints. (b) Simple exercise using jackplane. (c) To prepare half-lap corner joint, mortise & tennon joints. (d) Simple exercise on wood working lathe.	6
2	Fitting (Bench Working) Shop: (a) Study of tools & operations (b) Simple exercises involving fitting work. (c) Make perfect male-female joint. (d) Simple exercises involving drilling / tapping / dieing.	6

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION - B		
3	Black Smithy Shop: (a) Study of tools & operations (b) Simple exercises based on black smithy operations such as upsetting, drawing down, punching, bending, fullering & swaging.	6
4	Welding Shop: (a) Study of tools & operations of Gas welding & Arc welding. (b) Simple butt and Lap welded joints. (c) Oxy-acetylene flame cutting.	6
SECTION - C		
5	Sheet-metal Shop: (a) Study of tools & operations. (b) Making Funnel complete with soldering. (c) Fabrication of tool-box, tray, electric panel box etc.	6
6	Machine Shop: (a) Study of Single point cutting tool, machine tools and operations. (b) Plane turning. (c) Step turning. (d) Taper turning. (e) Threading.	6
SECTION - D		
7	Foundry Shop: (a) Study of tools & operations (b) Pattern making. (c) Mould making with the use of a core. (d) Casting	6
8	Electrical and Electronics Shop: (a) Study of tools & operations	6

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Outcomes:	
1	To acquire skills in basic engineering practice, measuring skills and practical skills in the trades.
2	To provides the knowledge of job materials in various shops.
3	To identify the hand tools and instruments.
4	To provides the knowledge of core technical subjects for making and working of any type of project.
5	Understand modern manufacturing operations, including their capabilities, limitations, and how to design economically.
6	Gain insight into how designers influence manufacturing schedule and cost, and cost of different components.
7	Learn how to analyze products and be able to improve their manufacturability and make the cost effectively.

Suggested / Reference Books:	
1	Lab Manual to be provided by Department of Mechanical Engineering
2	Work shop technology by Hajra and Chaudhary
3	Work shop technology by Chapmen

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

PBL 121 : ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - I

ਸਮਾਂ : 3 ਘੰਟੇ

ਕਰੈਡਿਟ : 2

ਕੁਲ ਅੰਕ : 50

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

ਸੈਕਸ਼ਨ-ਏ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
ਕਵਿਤਾ ਭਾਗ : 1-4 ਕਵੀ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਗੁਰਮੁਖੀ ਔਰਥੋਗਰਾਫੀ ਦੀ ਜੁਗਤ (ਪੈਂਤੀ, ਮੁਹਾਰਨੀ, ਬਿੰਦੀ, ਟਿੱਪੀ ਤੇ ਅੱਧਕ); ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ, ਸ਼ਬਦ ਜੋੜ (ਸ਼ੁਧ-ਅਸ਼ੁਧ)

ਸੈਕਸ਼ਨ-ਬੀ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
ਕਵਿਤਾ ਭਾਗ : 5-8 ਕਵੀ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਲੇਖ ਰਚਨਾ (ਜੀਵਨੀ-ਪਰਕ, ਸਮਾਜਕ ਅਤੇ ਚਲੰਤ ਵਿਸ਼ਿਆਂ ਉੱਤੇ) : 10 ਲੇਖ ਲਿਖਵਾਉਣੇ
(ਕਲਾਸ ਵਿੱਚ ਅਤੇ ਘਰ ਲਈ ਅਭਿਆਸ)

ਸੈਕਸ਼ਨ-ਸੀ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
ਕਹਾਣੀ ਭਾਗ : 1-4 ਕਹਾਣੀਆਂ
(ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ, ਸਾਰ, ਕਹਾਣੀ-ਕਲਾ)
- II. ਸ਼ੁੱਧ, ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ
(15 ਪੈਰ੍ਹਿਆਂ ਦੇ ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ ਅਭਿਆਸ ਕਰਵਾਉਣੇ)

ਸੈਕਸ਼ਨ-ਡੀ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
ਕਹਾਣੀ ਭਾਗ : 5-8 ਕਹਾਣੀਆਂ
(ਕਹਾਣੀ ਦਾ ਵਿਸ਼ਾ-ਵਸਤੂ, ਸਾਰ, ਕਹਾਣੀ-ਕਲਾ)
- II. ਅਖਬਾਰੀ ਇਸ਼ਤਿਹਾਰ : ਨਿੱਜੀ, ਦਫ਼ਤਰੀ ਤੇ ਸਮਾਜਕ ਗਤੀਵਿਧੀਆਂ ਨਾਲ ਸੰਬੰਧਤ

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਰਾਜਿੰਦਰਪਾਲ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਕਵਿਤਾ ਦਾ ਇਤਿਹਾਸ, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ।
2. ਬ੍ਰਹਮਜਗਦੀਸ਼ ਸਿੰਘ, ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਾਵਿ ਸਿਧਾਂਤ, ਇਤਿਹਾਸ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ, ਵਾਰਿਸ ਸ਼ਾਹ ਫਾਊਂਡੇਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
3. ਬਲਦੇਵ ਸਿੰਘ ਧਾਲੀਵਾਲ, ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਇਤਿਹਾਸ, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ।
4. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਸਫ਼ਰ ਤੇ ਸ਼ਾਸਤ੍ਰ ਭਾਗਾਂ, ਸਿੰਘ ਬ੍ਰਦਰਜ਼, ਅੰਮ੍ਰਿਤਸਰ।
5. ਹਰਕੀਰਤ ਸਿੰਘ ਤੇ ਗਿਆਨੀ ਲਾਲ ਸਿੰਘ, ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਣ, ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਚੰਡੀਗੜ੍ਹ।
6. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ।
7. ਮਿੰਨੀ ਸਲਵਾਨ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁੱਢਲੇ ਸੰਕਲਪ, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
8. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਬੋਧ, ਕਸਤੂਰੀ ਲਾਲ ਐਂਡ ਸੰਨਜ਼, ਅੰਮ੍ਰਿਤਸਰ।

PBL-122 : ਮੁੱਢਲੀ ਪੰਜਾਬੀ--I

(In lieu of Compulsory Punjabi)

ਸਮਾਂ : 3 ਘੰਟੇ

ਕਰੈਡਿਟ : 2

ਕੁਲ ਅੰਕ : 50

Mid Semester Examination: 20% weightage

End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਸੈਕਸ਼ਨ-ਏ

ਪੈਂਤੀ ਅੱਖਰੀ : ਅੱਖਰ ਕ੍ਰਮ, ਮਾਤ੍ਰਾਵਾਂ

(ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ)

ਲਗਾਖਰ (ਬਿੰਦੀ, ਟਿੱਪੀ, ਅੱਧਕ) : ਪਛਾਣ ਤੇ ਵਰਤੋਂ

ਸੈਕਸ਼ਨ-ਬੀ

ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ

ਸਾਧਾਰਨ ਸ਼ਬਦ, ਸੰਯੁਕਤ ਸ਼ਬਦ, ਮਿਸ਼ਰਤ ਸ਼ਬਦ

ਮੂਲ ਸ਼ਬਦ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ

ਸੈਕਸ਼ਨ-ਸੀ

ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ

ਸਮਾਨਾਰਥਕ ਤੇ ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ

ਸੈਕਸ਼ਨ-ਡੀ

ਹਫ਼ਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰ੍ਹਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਂ,

ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿਚ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਅਤੇ ਵਿਹਾਰ, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ।
2. ਮੁੱਢਲੀ ਪੰਜਾਬੀ, ਕਸਤੂਰੀ ਲਾਲ ਐਂਡ ਸੰਨਜ਼, ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।
3. ਮਿੰਨੀ ਸਲਵਾਨ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁੱਢਲੇ ਸੰਕਲਪ, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - I)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

PUNJAB HISTORY & CULTURE
HSL-101 : HISTORY AND CULTURE OF THE PUNJAB (1450-1716)
(Special paper in lieu of Punjabi Compulsory)

Credits: 2-0-0

Marks : 50

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

1. Land and the People.
2. Bhakti Movement

SECTION-B

3. Life and Teaching of Guru Nanak Dev.
4. Contribution of Guru Angad Dev, Guru Arjun Dev, Guru Amar Das and Guru Ram Das.

SECTION-C

5. Guru Hargobind.
6. Martyrdom of Guru Teg Bahadur

SECTION-D

7. Guru Gobind Singh and the Khalsa.
8. Banda Singh Bahadur: Conquests and Execution.

Suggested Reading

1. Kirpal Singh(ed.), *History and Culture of the Punjab, Part-ii, Punjabi University, Patiala, 1990.*
2. Fauja Singh (ed.), *History of Punjab, Vol, III Punjabi University, Patiala, 1987.*
3. J.S. Grewal, *The Sikhs of the Punjab, Cup, Cambridge, 1991.*
4. Khushwant Singh, *A History of the Sikhs, Vol. I, OUP, New Delhi, 1990*

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Engineering Mechanics
Course Code	:	CEL-120
Credits (L-T-P)	:	4 (3-1-0)
Total Marks	:	100
Mid Semester	:	20% weightage
End Semester	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:

- To understand distributed force systems, centroid/ centre of gravity and method of finding centroids of composite figures and bodies.
- To understand moment of inertia and method of finding moment of inertia of areas and bodies.
- To understand dynamics of a particle.
- To understand the kinetics of rigid bodies and simple problems.

Total No. of Lectures –

Lecture wise breakup		Number of Lectures
SECTION - A		
1	Introduction: Force system, dimensions and units in mechanics, laws of mechanics, vector algebra, addition and subtraction of forces, cross and dot products of vectors, moment of a force about a point and axis, couple and couple moment, transfer of a force to a parallel position, resultant of a force system using vector method, Problems involving vector application. Equilibrium: Static and dynamic equilibrium, static in determinacy, general equations of equilibrium, Varignon's theorem, Lami's theorem, equilibrium of bodies under a force system, Problems.	
SECTION - B		
2	Truss and Frames: Truss, classification of truss, assumptions in truss analysis, perfect truss, analysis of perfect plane truss using method of joints and method of sections, Problems. Centroid, Centre of mass and Centre of gravity, Determination of centroid, centre of mass and centre of gravity by integration method of regular and composite figures and solid objects, Problems.	

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION - C	
3	Moment of Inertia: Area moment of inertia, mass moment of inertia, parallel axis and perpendicular axis theorems, radius of gyration, polar moment of inertia, product of inertia, principle axis, problem based on composite figures and solid objects. Kinematics: Concept of rigid body, velocity and acceleration, relative velocity, translation and rotation of rigid bodies, equations of motion for translation and rotation, problems.
SECTION - D	
4	Particle Dynamics: Energy methods and momentum methods, Newton's laws, work energy equation for a system of particles, linear and angular momentum equations, projectile motion, problem. Shear Force and Bending Moment Diagram for statically determinant beams Classification of beams, types of loads, shear force and bending moment calculation and their graphical presentation, point of inflection, problem.

Course Outcomes:	
1	Basic understanding of laws and principles of mechanics.
2	Ability to analyse and solve simple problems of mechanics.
3	An understanding of assumptions and limitations of approaches used.

Suggested / Reference Books:	
1	Engineering Mechanics – Irving H. Shames, PHI Publication.
2	Engineering Mechanics – U.C. Jindal, Galgotia Publication.
3	Mechanics–Berkeley Physics Course, Vol–I (Second Edition): C. Kittel, W.D. Knight, M.A. Ruderman, C.A. Helmholtz and R.J. Moyer–Tata McGraw Hill Publishing Company Ltd., New Delhi.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Engineering Graphics & Drafting
Course Code	:	MEL-120
Credits (L-T-P)	:	4 (2-0-2)
Total Marks	:	100
Mid Semester Examination	:	20% weightage
End Semester Examination	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:

At the end of this course, the student should be able to understand the

1. Increase ability to communicate with people
2. Learn to sketch and take field dimensions.
3. Learn to take data and transform it into graphic drawings.
4. Learn basic CAD skills.
5. Learn basic engineering drawing formats
6. Prepare the student for future Engineering positions

Total No. of Lectures – 48

Lecture wise breakup		Number of Lectures
SECTION - A		
1	Introduction: Instruments used, Lettering, Types of Lines used, Scales, Types of Projections in use, Dimensioning of Figures, etc.; Orthographic Projections of Points, Lines & Lamina Lab Work: Introduction to AutoCAD, Practice of 2D commands, Exercises related to the theory contents of Unit-I	12
SECTION - B		
2	Projection of Solids: Section of Solids & its Projections; Interpenetration of Solids & Curve of Interpenetration; Development of Surfaces. Lab Work: Familiarity with 3D commands, Exercises related to the theory contents of Unit-II	12
SECTION - C		
3	Isometric Drawing & Isometric Projection Lab Work: Lab Exercises related to the theory contents of Unit-III	12
SECTION - D		

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

4	Free-Hand sketching of Engineering Components, Advance 3D Commands: Solving Problems using AutoCAD. Lab Work: Lab Exercises related to the theory contents of Unit-IV	12
----------	--	----

Course Outcomes:	
1	Student's ability to hand letter will improve.
2	Student's ability to perform basic sketching techniques will improve.
3	Students will be able to draw orthographic projections and sections.
4	Student's ability to use architectural and engineering scales will increase.
5	Student's ability to produce engineered drawings will improve.
6	Student's ability to convert sketches to engineered drawings will increase.
7	Students will become familiar with office practice and standards.
8	Students will become familiar with two and three dimensional drawings.
9	Students will develop good communication skills and team work.

Suggested / Reference Books:	
1	Engineering Drawing, N. D. Bhatt
2	Engineering Graphics with AutoCAD, James D. Bethune
3	Engineering Drawing & Graphics, K. Venugopal
4	Engineering Drawing PS Gill
5	Engineering Drawing, M. B. Shah & B. C. Rana

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Mathematics-II
Course Code	:	MTL-102
Credits (L-T-P)	:	4 (3-1-0)
Total Marks	:	100
Mid Semester Examination	:	
End Semester Examination	:	

Instructions for the Paper Setters:-

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:
The aim of the course is to enlighten the students with engineering mathematics which they would need to implement in their respective engineering branches. This course would prepare the students for implementation of these concepts in future applications and help them trouble shoot the problems associated with their respective disciplines.

Total No. of Lectures – 45

Lecture wise breakup		Number of Lectures
SECTION - A		
1	Fourier Series: Euler's formula, Conditions for a Fourier expansion, Functions having points of discontinuity, Change of interval, Odd and even periodic functions, Expansion of odd and even periodic functions, Half-range series	10
SECTION - B		
2	Ordinary Differential Equations : Exact equations, Equations reducible to exact equations, Linear differential equations with constant co-efficients, Complimentary functions and particular integral, Method of variation of parameters, Equations reducible to linear equations with constant co-efficients (Cauchy's and Legendre's linear equations).	12
SECTION - C		
3	Complex Analysis: De Moivre's theorem with applications, Analytic functions, Cauchy-Riemann equations, Harmonic functions, Cauchy's integral theorem, Cauchy's integral formula (without proofs), Taylor series and Laurent series (without proofs) Residues and Residue theorem.	10

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION - D		
4	Integral Transforms: Laplace Transforms of standard functions and their properties, Inverse Laplace Transforms, General Properties of inverse Laplace transforms and Convolution Theorem, Fourier transforms, Finite Fourier Sine and Cosine Transforms, modulation theorem, shifting properties, Convolution theorem.	13

Course Outcomes:	
1	The students will be able to classify differential equations according to certain features.
2	The tool of Fourier series and Laplace Transforms for learning advanced Engineering Mathematics.
3	The students will learn the mathematical tools needed in evaluating complex analysis and their usage.

Suggested / Reference Books:	
1	Kreyszig: Engineering Mathematics, Wiley Eastern Ltd.
2	B.S. Grewal: Higher Engineering Mathematics, Khanna Publisher, New Delhi.
3	Louis A. Pipes: Applied Mathematics for Engineers and Physicists, McGraw Hill Book Company.

Course Name	:	Physics
Course Code	:	PHL-183
Credits (L-T-P)	:	5 (3-1-1)
Total Marks	:	100
Mid Semester Examination	:	20% weightage
End Semester Examination	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:	
<ul style="list-style-type: none"> • To make the students aware about Electromagnetic wave fundamentals. • To make students aware about quantum physics phenomena. 	

Total No. of Lectures – 48

Lecture wise breakup		Number of Lectures
SECTION – A		
1	Electric and magnetic fields in a medium, Susceptibility and Conductivity, Maxwell's equations, Boundary conditions; EM wave equation, Plane wave solutions.	12

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION – B		
2	Polarization of the EM waves, Pointing vector and intensity of the EM wave; Wave packet, Phase and Group velocities; Reflection and refraction of EM waves at a dielectric interface; Brewster angle; Total internal reflection at a dielectric interface; EM waves in a conducting medium and plasma.	12
SECTION – C		
3	Wave-particle duality, de-Broglie waves; Quantum mechanical operators; Schroedinger equation, Wave function, Statistical interpretation, Superposition Principle, Continuity equation for probability density; Stationary states, Bound states.	12
SECTION - D		
4	Free-particle solution, 1-D infinite potential well, Expectation values and uncertainty relations; 1-D finite potential well, Quantum mechanical tunneling and alpha- decay, Kronig-Penny model and emergence of bands	12

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

Course Outcomes:	
1	This will enable the students to learn physical concepts associated with electromagnetic radiation and devices.
2	Student will understand quantum mechanical aspects of physics.

Suggested / Reference Books:	
1	Concepts of Modern Physics. Arthur Beiser, (Tata McGraw-Hill, Sixth Edition 2003).
2	Lasers & Nonlinear optics. B.B. Laud (New Delhi, India: Wiley Eastern 1991).

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Course Name	:	Introduction to Engineering Materials
Course Code	:	MEL-110
Credits (L-T-P)	:	3 (3-0-0)
Total Marks	:	100
Mid Semester	:	20% weightage
End Semester Examination	:	80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

Course Objectives:

At the end of this course, the student should be able to understand the:

1. To review physics and chemistry in the context of materials science & engineering.
2. To describe the different types of bonding in solids, and the physical outcomes of these differences.
3. Give an introduction to metals, ceramics, polymers, and electronic materials in the context of a molecular level understanding of bonding.
4. Give an introduction to the relation between processing, structure, and physical properties.
5. Give the beginning student an appreciation of recent developments in materials science & engineering within the framework of this class.
6. Give the beginning student practice in basic expository technical writing.

Total No. of Lectures – 47

Lecture wise breakup		Number of Lectures
SECTION - A		
1	Introduction: Historical perspective, scope of materials science and engineering. Atomic structure and interatomic bonding. Lattices, basic idea of symmetry.	11
SECTION - B		
2	Lattice structure: Bravais lattices, unit cells, crystal structures, crystal planes and directions, co-ordination number. Single crystals, polycrystalline, non-crystalline, nano-crystalline materials. Imperfections in solids: point defects, line defects, surface defects.	12
SECTION - C		
3	Solid solutions: phases, phase diagrams. Diffusion phenomenon, phase transformations. Strengthening mechanisms.	12

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION - D		
4	Classification of materials: properties of materials. Structure, properties and applications of different metals and alloys, ceramics, composites and polymers.	12

Course Outcomes:	
1	Given a type of material, be able to qualitatively describe the bonding scheme and its general physical properties, as well as possible applications.
2	Given a type of bond, be able to describe its physical origin, as well as strength.
3	Be able to qualitatively derive a material's Young's modulus from a potential energy curve.
4	Given the structure of a metal, be able to describe resultant elastic properties in terms of its 1D and 2D defects.
5	Be able to do simple diffusion problems.

Suggested / Reference Books:	
1	Materials Science and Engineering by W.D. Callister Jr. (John Wiley & Sons Inc., Eighth Edition).
2	Materials Science and Engineering: A First Course by V. Raghvan (Prentice-Hall of India Pvt. Ltd.).

PBL 131 : ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ-II
(Ability Enhancement Compulsory Course)

ਸਮਾਂ : 3 ਘੰਟੇ

ਕਰੈਡਿਟ : 2
 ਕੁਲ ਅੰਕ : 50

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿਚ ਕਰ ਸਕਦਾ ਹੈ।

ਸੈਕਸ਼ਨ-ਏ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
 1-4 ਨਿਬੰਧ
 (ਨਿਬੰਧ ਦਾ ਸਾਰ, ਵਾਰਤਕ ਕਲਾ ਅਤੇ ਸ਼ੈਲੀ)
- II. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ/ਮੂਲ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਵਿਉਂਤਪਤ ਅਤੇ ਰੁਪਾਂਤਰੀ), ਸਮਾਸ।

ਸੈਕਸ਼ਨ-ਬੀ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
 5-8 ਨਿਬੰਧ
 (ਨਿਬੰਧ ਦਾ ਸਾਰ, ਵਾਰਤਕ ਕਲਾ ਅਤੇ ਸ਼ੈਲੀ)
- II. ਪੈਰ੍ਹਾ ਰਚਨਾ : ਕਲਾਸ ਵਿਚ 10 ਵਿਸ਼ਿਆਂ (ਸਭਿਆਚਾਰ, ਧਾਰਮਕ ਅਤੇ ਰਾਜਨੀਤਕ) 'ਤੇ ਪੈਰ੍ਹਾ ਰਚਨਾ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ।

ਸੈਕਸ਼ਨ-ਸੀ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
 1-4 ਰੇਖਾ ਚਿਤਰ
 (ਨਾਇਕ ਬਿੰਬ, ਕਲਾਤਮਕ ਪੱਖ)
- II. ਮੁਹਾਵਰੇ ਤੇ ਅਖਾਣ (ਅਖਾਣ ਤੇ ਮੁਹਾਵਰਾ ਕੋਸ਼ ਵਿਚ) 200 ਮੁਹਾਵਰਿਆਂ ਅਤੇ 100 ਅਖਾਣਾਂ ਨੂੰ ਵਾਕਾਂ ਵਿਚ ਵਰਤਣ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ (ਕਲਾਸ ਵਿਚ ਤੇ ਘਰ ਲਈ)।

ਸੈਕਸ਼ਨ-ਡੀ

- I. **ਸਰਵੋਤਮ ਪੰਜਾਬੀ ਸਾਹਿਤ** (ਸੰਪਾ. ਡਾ. ਰਮਿੰਦਰ ਕੌਰ, ਡਾ. ਮੇਘਾ ਸਲਵਾਨ)
 5-8 ਰੇਖਾ ਚਿਤਰ
 (ਨਾਇਕ ਬਿੰਬ, ਕਲਾਤਮਕ ਪੱਖ)
- II. ਸ਼ਬਦ ਸ੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸੰਬੰਧਕ

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਸਤਿੰਦਰ ਸਿੰਘ, ਪੰਜਾਬੀ ਵਾਰਤਕ ਦਾ ਇਤਿਹਾਸ, ਪੰਜਾਬੀ ਅਕਾਦਮੀ, ਦਿੱਲੀ।
2. ਪ੍ਰੋ. ਪਿਆਰਾ ਸਿੰਘ, ਪੰਜਾਬੀ ਵਾਰਤਕ : ਸਿਧਾਂਤ ਇਤਿਹਾਸ ਪ੍ਰਵਿਰਤੀਆਂ, ਨਿਊ ਬੁੱਕ ਕੰਪਨੀ, ਜਲੰਧਰ।
3. ਇੰਦਰਪ੍ਰੀਤ ਸਿੰਘ ਧਾਮੀ, ਪੰਜਾਬੀ ਰੇਖਾ ਚਿੱਤਰ : ਰੂਪ ਤੇ ਪ੍ਰਕਾਰਜ, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
4. ਬਲਬੀਰ ਸਿੰਘ ਦਿਲ, ਪੰਜਾਬੀ ਨਿਬੰਧ : ਸਰੂਪ, ਸਿਧਾਂਤ ਅਤੇ ਵਿਕਾਸ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।
5. ਹਰਕੀਰਤ ਸਿੰਘ ਤੇ ਗਿਆਨੀ ਲਾਲ ਸਿੰਘ, ਕਾਲਜ ਪੰਜਾਬੀ ਵਿਆਕਰਣ, ਪੰਜਾਬ ਯੂਨੀਵਰਸਿਟੀ, ਚੰਡੀਗੜ੍ਹ।
6. ਡਾ. ਅਮਰ ਕੋਮਲ (ਸੰਪਾ.), ਚੋਣਵੇਂ ਪੰਜਾਬੀ ਨਿਬੰਧ (ਭੂਮਿਕਾ), ਨੈਸ਼ਨਲ ਬੁੱਕ ਟਰੱਸਟ, ਇੰਡੀਆ।
7. ਅਬਨਾਸ਼ ਕੌਰ, ਪੰਜਾਬੀ ਰੇਖਾ ਚਿੱਤਰ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।
8. ਮਿੰਨੀ ਸਲਵਾਨ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁੱਢਲੇ ਸੰਕਲਪ, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।
9. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ।

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

PBL-132 : ਮੁੱਢਲੀ ਪੰਜਾਬੀ-II
(In lieu of Compulsory Punjabi)

ਸਮਾਂ : 3 ਘੰਟੇ
ਕਰੈਡਿਟ : 2

ਕੁਲ ਅੰਕ : 50

Mid Semester Examination: 20% weightage
End Semester Examination: 80% weightage

ਅੰਕ-ਵੰਡ ਅਤੇ ਪਰੀਖਿਅਕ ਲਈ ਹਦਾਇਤਾਂ

1. ਪ੍ਰਸ਼ਨ ਪੱਤਰ ਦੇ ਚਾਰ ਭਾਗ ਹੋਣਗੇ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਦੋ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ।
2. ਵਿਦਿਆਰਥੀ ਨੇ ਕੁੱਲ ਪੰਜ ਪ੍ਰਸ਼ਨ ਕਰਨੇ ਹਨ। ਹਰ ਭਾਗ ਵਿੱਚੋਂ ਇੱਕ ਪ੍ਰਸ਼ਨ ਲਾਜ਼ਮੀ ਹੈ। ਪੰਜਵਾਂ ਪ੍ਰਸ਼ਨ ਕਿਸੇ ਵੀ ਭਾਗ ਵਿੱਚੋਂ ਕੀਤਾ ਜਾ ਸਕਦਾ ਹੈ।
3. ਹਰੇਕ ਪ੍ਰਸ਼ਨ ਦੇ ਬਰਾਬਰ ਅੰਕ ਹਨ।
4. ਪੇਪਰ ਸੈੱਟ ਕਰਨ ਵਾਲਾ ਜੇਕਰ ਚਾਹੇ ਤਾਂ ਪ੍ਰਸ਼ਨਾਂ ਦੀ ਵੰਡ ਅੱਗੋਂ ਵੱਧ ਤੋਂ ਵੱਧ ਚਾਰ ਉਪ-ਪ੍ਰਸ਼ਨਾਂ ਵਿੱਚ ਕਰ ਸਕਦਾ ਹੈ।

ਸੈਕਸ਼ਨ-ਏ

ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ
(ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ)

ਸੈਕਸ਼ਨ-ਬੀ

ਨਿੱਤ ਵਰਤੋਂ ਦੀ ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇ-ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਨਾਲ ਸੰਬੰਧਤ

ਸੈਕਸ਼ਨ-ਸੀ

ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ
ਸਾਧਾਰਨ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)
ਸੰਯੁਕਤ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)
ਮਿਸ਼ਰਤ ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਸੈਕਸ਼ਨ-ਡੀ

ਪੈਰ੍ਹਾ ਰਚਨਾ
ਸੰਖੇਪ ਰਚਨਾ

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਬੂਟਾ ਸਿੰਘ ਬਰਾੜ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਸਿਧਾਂਤ ਅਤੇ ਵਿਹਾਰ, ਚੇਤਨਾ ਪ੍ਰਕਾਸ਼ਨ, ਲੁਧਿਆਣਾ।
2. ਮੁੱਢਲੀ ਪੰਜਾਬੀ, ਕਸਤੂਰੀ ਲਾਲ ਐਂਡ ਸੰਨਜ਼, ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ।
3. ਮਿੰਨੀ ਸਲਵਾਨ, ਪੰਜਾਬੀ ਵਿਆਕਰਨ : ਮੁੱਢਲੇ ਸੰਕਲਪ, ਰਵੀ ਸਾਹਿਤ ਪ੍ਰਕਾਸ਼ਨ, ਅੰਮ੍ਰਿਤਸਰ।

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - II)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

PUNJAB HISTORY & CULTURE
HSL-102 : HISTORY AND CULTURE OF THE PUNJAB (1717-1947)
(Special paper in lieu of Punjabi Compulsory)

Credits: 2-0-0

Marks : 50

Mid Semester Examination: 20% Weightage

End Semester Examination: 80% Weightage

Instructions for the Paper Setters

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

SECTION-A

1. Sikh Struggle for Sovereignty.
2. Ranjit Singh : Conquests, Administration and the Anglo-Sikh Relations.

SECTION-B

3. Anglo-Sikh Wars and the Annexation.
4. The Punjab under the British: New Administration, Education and social Change.

SECTION-C

5. Economic Changes: Agricultural
6. Socio-Religious Reform Movements.

SECTION-D

7. Role of Punjab in the Freedom Struggle.
8. Fairs and Festivals.

Suggested Reading

1. Kirpal Singh (ed.), *History and Culture of the Punjab*, Part-II, Punjabi University, Patiala, 1990.
2. Fauja Singh (ed.), *History of Punjab*, Vol, III, Punjabi University, Patiala, 1987.
3. J.S. Grewal, *The Sikhs of the Punjab*, Cup, Cambridge, 1991.
4. Khushwant Singh, *A History of the Sikhs*, Vol. I, OUP, New Delhi, 1990

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-201
Time: 3 hours

PRETREATMENT TECHNOLOGY-I

Credits: 3-0-0
Max. Marks: 75

Mid Semester Examination: 20% Weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Singeing: Different sequences of processes in a cotton textile mill. Singeing machines-Roller singeing m/c, Plate singeing m/c, Gas singeing m/c, Device for obtaining combustible mixture, singeing of fabrics made from synthetic fibres or blends.

SECTION-B

Desizing: Sizing, characteristics of warp size. Desizing, classification of desizing methods, hydrolytic methods & oxidative methods, high temperature enzymatic desizing, desizing of textiles having PVA based sizes.

SECTION-C

Scouring: Introduction, Scouring of cotton, details of the scouring process, Efficiency of kier boiling, Estimation of degradation of cotton undergone during scouring. Machine used in scouring process i.e. batch and continuous scouring includes Kiers, Vaporloc unit. J-boxes, Pad Steam. Enzymatic scouring, basic principles involved in enzymatic scouring, comparison with conventional scouring, Solvent scouring.

SECTION-D

Bleaching: Application of Reducing & Oxidizing bleaching agents, Bleaching cellulosic fabrics with hypochlorites, Bleaching with peroxides, Bleaching with Sodium Chlorite, Bleaching with peracetic acid, low temperature bleaching for minimum fibre damage, Reaction Mechanism of the principle bleaching processes. Assessment of bleaching performance, Whiteness index, Yellowness index. Batch, semi-continuous and Continuous bleaching machines, its part includes, J-box, open width pad steamers.

References:

1. Chemical Technology in the Pre-treatment Processes of Textiles by S.R. Karmakar, Published by Elsevier Publications, The Netherlands.
2. Textile Scouring & Bleaching by E.R. Trotman, Published by B.I. Publications Pvt. Ltd, New Delhi.
3. Technology of Bleaching & Mercerization Vol. III by Dr. V. A. Shenai, Published by Sevak Publications.
4. Handbook of Fibre Science and Technology – Volume I Chemical Properties of Fibers and Fabrics Fundamentals and Preparation Part–A. Edited by Mena Chem Lewin and Stephen B– Sello. Published by Marcel Dekker Inc. New York.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-202

COLOR SCIENCE

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction to the Physical Basis and Measurement of Color: Introduction, Source of natural light, sources of artificial light, CIE illuminants, Absorption & scattering of light. Beer-Lambert law, Kubelka-Munk's Equation. Spectrophotometric curves and their relationship to pre-received colour. Instruments for the measurement of the colour of transparent and opaque objects. Principles of spectrophotometry. Color terms and definitions: hue, strength, depth, dullness and brightness. Light absorption, reflection and color: hue and wavelength position of light absorption.

SECTION-B

Measurement of Color: Introduction, the tristimulus colorimeter, spectrophotometer, reflectance measurements, spectrophotometer light sources, instrument geometries: 45/normal (45/0), normal/45 (0/45), diffuse/normal (D/0), normal/diffuse (0/D), dual beam spectrophotometer, application of transmission spectrophotometry to dyes: precautions in the analysis of dye solutions.

Colorimetry and the CIE System: Calculation of tristimulus values from measured reflectance values. The 1931 CIE system: standard primaries, standard light sources and standard illuminants (A, B and C), standard observer, standard illumination and viewing conditions, units. Additions to the CIE system: D illuminants, calculation of tristimulus values from R values measured at 20 nm intervals, relationship between tristimulus values and color appearance, chromaticity diagrams, usefulness and limitation of the CIE system.

SECTION-C

Color Order Systems, Color Spaces, Color Difference and Color Scales: Munsell's system of colour specification. Relationship of hue, value and chroma. The 1931 CIE system. CMC. Additive and subtractive mixing. Standard observer colour matching functions. Tristimulus values. Chromaticity coordinates. Metamerism. Whiteness & Yellowness Index, Computer aided Colour matching.

SECTION-D

Recipe Prediction for Textiles: Introduction, Computer colorant formulation, discussion on relationship of tristimulus values with spectral reflectance, and relationship of spectral reflectance with colorant concentration, use of spectrophotometer in smart match/ recipe prediction and shade correction etc.

References:

1. Color Physics for Industry by Roderick McDonald, Second Edition, 1997, Society of Dyers and Colorists, UK
2. The Chemistry of Colour Application by R.M. Christie, R.R. Mather and R.H. Wardman, 2000, Blackwell Science, London.
3. Billmeyer and Saltzman's Principles of Color Technology by Roy S. Berns, 3rd Edition, 2000, John Wiley and Sons, Inc., New York.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-203

TEXTILE FIBRES

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction of Textile Fibres: Classification of textile fibres and their general properties

Essential properties of fibre forming polymer: Essential characteristics of fibre forming polymers, molecular arrangement, Chemical constitution of different fibres, types of inter and intra-molecular forces of attraction in fibre forming polymer systems (hydrogen bonds, covalent bonds, Vander-Waals forces of attraction), Amorphous and crystalline phase: Glass transition, plasticization, crystallization, melting. Factors affecting Tg and Tm. approaches to describe fibre fine structure: one and two phase models for natural cellulosic fibres, regenerated and modified celluloses, protein fibres, synthetic fibers.

SECTION-B

Cellulosic Fibres: Production of cotton, - methods of harvesting, organic cotton, Cotton, Chemical nature, nature of impurities, hydrocellulose and oxycellulose, cotton grading, physical and chemical properties.

Bast, fruit and leaf fibres: Flax, jute, coir, ramie, banana, pineapple, hemp, chemical nature, nature of impurities, Fibre extraction method, physical and chemical properties.

SECTION-C

Protein Fibres: Wool, chemical composition, nature of impurities, types of wool, grading, physical and chemical properties. Brief about the other hair fibers like Mohair, Cashmere, Angora, Camel hair, etc. Silk, chemical composition, nature of impurities, fibroin and sericin, degumming and weighting process, grading of silk, sericulture, processing of silk, difference between wool and silk.

Mineral fibres: Composition, physical and chemical properties.

SECTION-D

Regenerated fibres: Viscose rayon, Acetate, Triacetate fibre, chemical composition, physical and chemical properties and their application.

Man-Made Fibres: Definition, physical and chemical properties: PET, Nylon, PP and Acrylic and their comparative studies.

High performance fibers: definition, types and their properties, comparison between High performance fibres and normal apparel fibers. Different fiber forms and their characteristics – Staple and Continuous.

References:

1. E.P.G. Gohl, L.D. Vilensky, Textile science, Longman Cheshire Pty Limited, 1980
2. Textiles, The Motivate Series by A.Wymne.
3. Manufactured Fibre Technology, V.B. Gupta and V.K. Kothari, Chapman and Hall, 1997.
4. Production of Synthetic Fibres by A.A. Vaidya, Prentice Hall of India Pvt. Ltd.
5. <https://nptel.ac.in/courses/116/102/116102026/>

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-204

TEXTILE TESTING-I

Credits: 3-0-0

Time : 3 Hrs.

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction to Testing: Reasons for textile testing, Standardization of testing.

The Selection of Samples for Testing: Terms used in sampling, reasons for sampling, aim of sampling, types of sampling methods, Random and biased samples, sampling for determination of fiber properties, yarn sampling method-the use of random numbers, fabric sampling,

Textile Statistics: Basic Statistics, numerical based on statistics for fibres and yarn testing.

SECTION-B

Moisture Relations and Testing: Introduction, regain and moisture content, atmospheric conditions and relative humidity, standard atmosphere, testing atmosphere, measurement of atmospheric conditions-dry and wet bulb hygrometers, hair hygrometers, electrolytic hygrometers, Regain-humidity relation of textiles-absorption curves of various materials, some factors affecting the regain of textile materials, interpretation of regain values, absorption and desorption curves. Effects of regain on fibre properties and dimensions. Measurement of regain-correct invoice weight, Shirley moisture meter.

Fibre Dimensions: Cotton fibre length measurement- The Shirley comb sorter, analysis of sorter diagram-average or mean length, maximum length, modal length, effective length, relationship between effective length and staple length, percentage short fibre, dispersion, the 'Uster' staple diagram apparatus, the Shirley photoelectric stapler, the fibrograph, digital fibrograph, span length, uniformity ratio and floating fibre percentage.

SECTION-C

The measurement of Fibre Fineness & Maturity: Importance of fibre fineness, definition of fibre fineness, methods of measuring fibre fineness- Air flow methods-Sheffield micronaire for cotton and wool, Arealometer, measurement of fibre fineness by vibroscope.

Maturity of Cotton: Maturity ratio, maturity count, standard fibre weight per cm, relation between immaturity count and fibre weight. Differential dyeing- the Goldwaite test for maturity, use of polarized light. Cotton fibre quality- American cotton grading. The measurement of Trash content- The Shirley Trash Analyzer, the SRRL non-lint tester.

Recent development in Fibre testing: Advance fibre information system (AFIS) and High Volume instrument (HVI)

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION-D

Yarn Dimensions: Linear density, count or yarn number, direct and indirect systems of yarn numbering, tex, denier, English count, woolen & worsted count. Wrap reel, Knowles balance, doubled yarn count calculations, yarn count and yarn diameter.

Twist and Twist Measurement: Twist direction, twist angle, function of twist in the yarn structure, twist and yarn strength, some effects twist on fabric properties, measurement of twist, yarn hairiness, crimp rigidity.

Reference:

1. Principles of Textile Testing by J.E. Booth, 3rd Edition, Published by CBS Publishers & Distributors, New Delhi.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-205

DYEING MACHINES

Credits: 2-0-0

Time: 3 hours

Max. Marks: 50

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Machine for fiber and yarn dyeing: Principle of working, neat sketch describing principle of working of the machines and salient features of the application of the machines used in top dyeing, loose-stock dyeing, hank dyeing, package dyeing,

SECTION-B

Machine for batch dyeing of fabric: Principle of working, neat sketch describing principle of working of the machines and salient features of the application of the Jig dyeing machines, Winch dyeing machines.

SECTION-C

Dyeing of open width fabric: Introduction (Batch, Semi continuous and continuous), Dyeing processes for cotton, linen, Viscose rayon and Jute etc.

Machine for semi-continuous dyeing of fabric: Principle of working, neat sketch describing principle of working of the machines and salient features of the application of the pad roll machines, washing of fabric.

SECTION-D

Continuous dyeing of fabric: Padding boxes, various types, Nip rollers, arrangement of rollers, dimensions of nip rollers, construction of nip rollers, special designs of mangle bowls, care of rubber rollers, application of pressure to the rollers, drive, liquor pick-up, safety and uniformity of expression. Vacuum impregnation, drying prior to fixation.

Reference:

1. Engineering in Textile Coloration Edited by C. Duckworth (1983 Edition), Chapter 1 Pages 1-68. The Dyers Company Publication Trust, Distributed by the Society of Dyers and Colorists (SDC), UK.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCP-201**PRETREATMENT LAB****Credits: 0-0-3****Max. Marks: 75**

- Desizing of cotton by different methods and evaluation of Desizing efficiency.
- Scouring of cotton and its evaluation.
- Bleaching of cotton with NaOCl and study the effect of different process parameters.
- Bleaching of cotton with hydrogen peroxide and study the effect of different process parameters.
- Bleaching of cotton with sodium chlorite and study the effect of different process parameters.
- Mercerization of cotton with and without tension.
- Role of temperature on mercerization of cotton.
- Effect of mercerization on dye uptake and other properties of cotton.
- Scouring of Raw Wool.
- Chlorination of Wool.
- Reductive bleaching of wool
- Oxidative bleaching of wool.
- Bleaching of synthetic fibres and their blends with natural fibres.

References:

1. Technology of Bleaching & Mercerization Vol. III by Dr. V.A. Shehnai Published by Sevak Publications.
2. Textile Scouring & Bleaching by E.R. Trotman Published by B.I. Publications Pvt. Ltd., New Delhi.
3. Chemical Technology in the Pre-treatment Processes of Textiles by S.R. Karmakar, Published by Elsevier Publications, The Netherlands.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-202 COMPUTER COLOR MATCHING LAB

Credits: 0-0-3
Max. Marks: 75

- Calibration of spectrophotometer.
- Measurement of colour using spectrophotometer.
- Measurement of reflectance and its conversion into K/S values.
- Validation of Lambert-Beer Law and determination of unknown concentrations.
- Preparation of dye data bases and their recording/storing in CCM.
- Determination of dye strength after dyeing.
- Comparison of dye strength after dyeing.
- Determination of whiteness index.
- Determination yellowness index.
- Recipe formulation of unknown shades.
- Evaluation of color related properties such as metamerism, color constancy.
- Evaluation of color difference.

References:

1. Color Physics for Industry by Roderick McDonald, Second Edition, 1987, Society of Dyers and Colourists, UK
2. Instrumental Color Measurement and Computer Aided Color Matching for Textile by H.S. Shah and R.S. Gandhi (1990 Edition), Mahajan Book Distributors, Ahmedabad.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - III)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-203

TEXTILE CHEMICAL TESTING LAB-I

Credits: 0-0-2

Max. Marks: 50

- Find the strength of Sodium dithionite and thiosulphate.
- Determine percentage of sodium carbonate and sodium hydroxide in given sample of caustic soda.
- To determine the strength of strong acid
- To determine the total and permanent hardness of water.
- Determination of Chlorine in sodium hypochlorite solution powder.
- To determine the fibre content of given pure fibre/yarn/fabric sample
- To determine the blend composition of a given sample having two fibres
- To determine the blend composition of given shoddy sample quantitatively
- To identify the class of dye on the given cellulosic fabric
- To identify the class of dye on the given woollen fabric/yarn
- To identify the class of dye on the given synthetic fabric/yarn

References:

1. Evaluation of Textile Chemicals Vol. VIII by V.A. Shenai and R.H. Mehra.
2. Vogel's textbook of quantitative inorganic analysis by J. Bassett.
3. Process House laboratory- A Handbook by Girish Luthra, Bapu Dehspande, MANTRA.
4. Handbook of Textile Testing (Part I, IV), Bureau of Indian Standards.
5. Detergent Analysis (Handbook for cost effective quality control) by B.M. Mildwidsky & D.M. Gabriel.
6. Standard Methods for the examination of water and wastewater by APHA (American Public Health Association, USA).

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-206**PRETREATMENT TECHNOLOGY-II****Credits: 3-0-0****Time: 3 hours****Max. Marks: 75****Mid Semester Examination: 20% weightage****Mid Semester Examination: 80% weightage****Instructions for the Paper Setters:**

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Combined processes: Combined desizing, scouring, combined scouring and bleaching, combined desizing, scouring, bleaching processes. Bleaching of synthetic fibers and its blends.

OBA/FBA: Introduction to OBA/FBA, types of OBA/FBA for cellulosic, wool, silk, synthetic fibers, chemical structures of OBA/FBA, Application of FBAs.

SECTION-B

Mercerization: Introduction, process variables and their effect on properties of mercerized cotton, factors affecting luster of mercerized cotton, tensile strength, swelling & solution. Effect of caustic concentration on shrinkage, changes occurring in physical structure of cellulose during and after mercerization, mercerizing wetting agents & requirements of a good mercerizing wetting agent. Assessment of degree of mercerization in terms of moisture regain and barium activity number. Yarn mercerizing machines, Fabric (Woven/Knitted) mercerizing machines-Pad chain type, chainless type & padless, chainless type, Mercerization of Blends, Continuous processing unit for slack mercerizing, Liquid Ammonia treatment, latest developments in the field.

SECTION-C

Wool pretreatment: Yarn scouring, scouring of woven or knitted fabrics, testing of scoured wool, machinery used for wool scouring, Testing of scoured wool for residual grease and damage, wool carbonization and milling, bleaching of wool and effect of pH on whiteness and damage, assessment of wool damage in alkaline scouring and bleaching.

SECTION-D

Silk pretreatment: Degumming of silk by different techniques. Degumming machines, bleaching of silk with hydrogen peroxide, bleaching of silk with reductive agents.

References:

1. Chemical Technology in the Pre-treatment Processes of Textiles by S.R. Karmakar, Published by Elsevier Publications, The Netherlands.
2. Textile Scouring & Bleaching by E.R. Trotman, Published by B.I. Publications Pvt. Ltd, New Delhi.
3. Technology of Bleaching & Mercerization Vol. III by Dr. V. A. Shenai, Published by Sevak Publications.
4. Handbook of Fibre Science and Technology – Volume I Chemical Properties of Fibers and Fabrics Fundamentals and Preparation Part–A. Edited by Mena Chem Lewin and Stephen B– Sello. Published by Marcel Dekker Inc. New York.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-207

MANUFACTURED FIBRE TECHNOLOGY

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction: Definition, evolution of manufactured fibres, fibre forming processes, fibre products and properties, production trends, application areas.

Raw Materials: Dimethyl terephthalate (DMT). Terephthalic acid (TPA)-Henkel-I process. Henkel-II process. Mobil process. Amoco process. Teijin process. Monoethylene glycol. Caproactam-Synthesis from phenol, toluene, cyclohexane and aniline. Adipic acid- Synthesis from phenol, Cyclohexane, Tetrahydrofuran (THF), butadiene, Hexamethylene diamine. Acrylonitrile- From acetylene, Ethylene oxide, Propylene

SECTION-B

Polymerisation: General information about polymers-Types of polymers, polymerization reactions (Condensation, addition and ring opening). Production of poly (ethylene terephthalate) polymer-Advantages of TPA over DMT. The chemical reactions for PET preparation. Side reactions, Polycondensation reaction. Batch process. Continuous process. Production of nylon 66 polymer-Preparation of HA salt. Polycondensation. Continuous polymerization process. Production of nylon 6 polymer-Parameters in water catalyzed system. Mechanism of polymerization. Conditions for an optimal polymerization. Batch process. Continuous process. Integrated continuous process. Production of polymer for making acrylic fibre-Methods of polymerization. Mechanism of polymerization. Batch process. Semi batch process. Continuous process. Production of polypropylene polymer- Polymerization processes. Suspension and Gas phase polymerization.

Melt Spinning: The melt spinning line, Extruders, melt spinning variables and conditions for continuous spinning, special features of high speed spinning, structure formation during spinning, integrated spin draw process.

SECTION-C

Wet and Dry Spinning: Introduction. Preparation of dope. Wet spinning-Post spinning operations. Fibre formation and coagulation variables. Development of structure and morphology, Dry spinning, comparative look at wet and dry spinning process. Dry jet-wet spinning. Manufacturing processes of viscose, cuprammonium rayon, cellulose acetate, cellulose triacetate, high tenacity cellulosic fibres, polynosic rayons, chemically modified cellulose fibres.

Spin Finishes: introduction, basic functions of spin finish- Desirable properties of a spin finish. Chemical constitution of a spin finish- Lubricants, Antistatic agents, Emulsifiers. Methods of application of spin finish. Effect of spin finish on dyeing behavior. Problems encountered during the use of spin finish.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

Drawing: Introduction, the drawing behavior of thermoplastic polymers (Polyester and Nylon), influence of drawing on structure and properties of synthetic fibers, high speed spinning and the spin draw process, drawing of pre-oriented yarns and draw warping

Texturing: Introduction, factors influencing the properties of textured yarns. Basic information about different types of texturing: Draw texturing (Sequential and simultaneous), Air Jet texturing, Gear crimping, Stuffer box Texturing, Knife edge crimping, Knit de-knit process.

Staple Fibre Production: Introduction, general staple fibre production line, Tow to top converter (Crush cutter and stretch breaking) and its application for bulk yarn production.

SECTION-D

Heat-setting: Introduction. Physics of heat-setting. Heat-setting and structural parameters. Mechanisms of heat-setting-Glass transition. Heat setting behaviour of polyamide and polyester fibres, heat setting of cellulose triacetate fibres, settability and the measurement of degree of sett.

Modified synthetic fibres: Drawbacks of synthetic fibres. Commercial importance of modified fibres. Preparation of modified synthetic fibres. Modified polyester fibres-Hydrophilic polyester. Hollow polyester. Low pilling polyester. Flame retardant polyester. Carrier-free dyeable polyester. Cationic dyeable polyester fibre. Silk like polyester. Modified nylon- Hydrophilic and antistatic nylon. Low pilling nylon. Flame retardant nylon, Differentially dyeable nylons. Modified acrylic fibres-Hydrophilic acrylic fibres. Low pilling acrylic fibres. Flame retardant acrylic fibres. Bicomponent acrylic fibres. Differentially dyeable acrylic.

High performance fibres: Aromatic polyamides (Kevlar and Nomex) and polyesters, Spectra, Teflon, glass, carbon fibres, metallic fibres.

References:

1. Manufactured Fibre Technology, V.B. Gupta and V.K. Kothari, Chapman and Hall, 1997, (Chapter 1, 4, 5, 6, 7, 11)
2. Production of Synthetic Fibres by A.A. Vaidya, Prentice Hall of India Pvt. Ltd. (Chapter 2, 3, 8, 9, 10).
3. Handbook of Textile Fibres: Natural Fibres (Vol. 1) and Man Made Fibres (Vol 2) by J. Gordon Cook, Published by Merrow Publishing Co. Ltd. England.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-208 INTRODUCTION TO YARN MANUFACTURE Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction to Spinning: Fibre characteristics (staple length, fibre denier, spinning limit, fibre strength, crimp, antistatic and antifriction fibre finish) and spinnability. Flow diagram of Cotton, woollen, worsted and semi-worsted system of spinning

Blending: Objectives of blending: improved functional properties, improved process performance, economy, fancy effect, aesthetics, measures of blending: degree of blending, index of blend irregularity, migration, migration index, tinting, selection of blend constituents, type of fibres, compatibility of blend fibres (length & denier of fibres, extensibility, fibre density, dispersion properties, drafting properties, dyeing properties, blend ratio), mechanics of blending: blending at blowroom (feeder blending, stack blending, lap blending), blending at drawframe, relative merits and demerits of blending methods discussed above

SECTION-B

Blowroom: Introduction, conditioning of stock, sequence of blowroom machines, introduction to two and three bladed beater, kirschener beater, porcupine opener, crighton opener and SRRL opener.

Carding: Objective of carding, card clothing: flat wire, cylinder wire (wire type, wire angle, wire-point density, wire height), doffer wire, licker-in wire, high production cards, speeds, settings: effect of fibre length, fibre denier, production, blend components. Nep removal and nep generation at carding. Sliver irregularity, autolevelling-objectives, short, medium and long term irregularities. their causes and correction.

Draw Frame: Objective, blending at drawframe (number and hank of slivers, slivers' disposition), fleece blending at drawframe, drafting systems, draft distribution, sliver hank, roller settings, delivery speed, roller lapping: causes and remedies, principle of autolevelling at drawframe.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION-C

Speed Frame: Introduction, drafting systems, roller settings, spindle speed, roving twist, false twist attachments. General considerations about roller weighing, use of condensers, spacers and aprons, surface finish of machine parts, winding tension, bobbin taper, storage of bobbins, stop motions.

Ring Spinning: Introduction, drafting systems, roller settings, modified drafting system with recessed apron top roller. Yarn twist, spindle speed, rings and travellers, yarn hairiness, end breaks, yarn quality. Common yarn faults: slubs, crackers or cockled yarn, neps, fluffy yarn, smoky yarn, twist setting and waste production.

Spinning of long staple fibre: Introduction, spinning processes, problems in processing and prospects of using long staple fibres, yarn quality and production.

Spinning of Dyed fibre: Introduction, requirement for spinning of dyed fibres, spinning processes, effect of dyeing on fibre properties, problems in dyed fibres, yarn quality and production.

SECTION-D

Spinning of Woollen and Worsted Yarns: Fibre specifications, process flow, and general introduction to spinning machinery.

Non Conventional Yarn Manufacturing: An introduction to the principles of rotor spinning, air jet spinning, friction spinning and their comparative study of the three systems of open end spinning with respect to productivity and yarn quality.

References:

1. Spinning of Man-made Fibres and Their Blends by Salhotra. (1993 Edition). Chapters (1-9). Published by Textile Association.
2. Textiles, The Motivate Series. Chapter (7,8)
3. Textiles Fibre to Fabric by Bernard P. Corbman. (Sixth Edition).Chapter (2). Published by McGraw Hill Book Company, New Delhi

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-209 NATURAL FIBRE AND FABRIC DYEING Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Cellulosics dyeing: Introduction, dye structure and properties of dyes used for cellulosic materials, dyeability of cellulose fibres (fibre, yarn and fabric form). Dye-fibre interaction with all dye classes, mechanism of dye fixation, after treatment processes.

SECTION-B

Direct dyes: Mechanism of direct dyeing, dye-fibre bond, effect of electrolytes, temperature and liquor ratio. Concept of percentage shade, application method for direct dyes on cellulosics and after treatments.

Dyeing with Azoics: Introduction to Azoic colours, methods of dissolution for naphthols, concept and process of diazotization, coupling reaction.

SECTION-C

Reactive colours: Reactivity and affinity of dyes, concept of hydrolysis. Application methods for chlorotriazine dyes and influence of process parameters. Dyeing mechanism for vinylsulphones, application process, continuous application techniques and after treatments. Concept of bifunctional dyes, reactive dyes for non-cellulosic substrates.

Vat and Sulphur dyes: Introduction, commercial vat and sulphur dyes and forms, concept of vatting and particle size. Classification of vat dyes, principles and application of vat dyes. Leuco vat, pigment padding, semi pigmentation and vat acid processes, yarn dyeing processes for denim.

SECTION-D

Proteins fibre dyeing: Dyeing of protein fibres with acid, metal- complex, mordant and reactive, dyes. Classification of these dyes, their mechanisms of action and effect of process parameters.

Dyeing of bast and regenerated fibres: introduction, dyeing processes and parameters.

References:

1. Engineering in Textile Coloration Edited by C. Duckworth (1983 Edition), Chapter 1 Pages 1-68. The Dyers Company Publication Trust, Distributed by the Society of Dyers and Colorists (SDC), UK.
2. Colorants and Auxiliaries, Volume-I, Edited by John Shore, The Society of Dyers and Colorists (SDC), UK (Chapters 6 and 7).
3. Cellulosics Dyeing Edited by John Shore (1995 Edition). Chapters 3-7. The Dyers Company Publication Trust, Distributed by the Society of Dyers and Colorists (SDC), UK.
4. Wool Dyeing Edited by David M. Lewis (1992 Edition). Chapters 2,6-8. The Dyers Company Publication Trust, Distributed by the Society of Dyers and Colorists (SDC), UK

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-210

TEXTILE & FASHION DESIGN

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage
Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction to art media and its application: Different art media like pencils, pencil colours, crayons, poster colours, erasers, acrylic rendering and shading skills.

Elements and principles design: line, form, shape, space, size, textures and colour. Principles of design- Harmony, Balance, Rhythm, Proportion, Emphasis.

Explain design and its types: Structural and functional designs. Difference between functional and non-functional design.

SECTION-B

Fashion Illustration basics: Fashion Figure, study of human anatomy, various proportions, the balance line in drawing figures, gestures and movements. 8 head, 10 head, 12 head figures, the fashion face, arms, legs, Hands and feet. Illustrating male figure and children, Figure analysis, body types, designing for diverse body types and ages.

Fashion terminologies: Fashion origin, evolution- with examples from different eras fashion, fad, cycle, style, classics, boutique, trend, haute couture, designer, prêt a porter, Mass Production, silhouette, Fashion icon, fashion follower, muse.

SECTION-C

Fashion and clothing theories: Clothing as modesty, protection, status and religious symbol, Fashion as status symbol, the major fashion centers Factors affecting fashion, Fashion forecasting and its types (Long & Short Term Forecasting)

Garment Features: types of silhouettes, collars, yoke variations, pockets, cuffs, sleeves Trousers, Fashion silhouettes - types of silhouettes, blouses formal, casual, and shirts – men and women. Skirts flared, pencil, circular, trousers, collars, cuts, yokes, pockets, cuffs as seen in illustration.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION-D

Textile designing: Meaning & importance Different techniques/methods of textile designing Elements of Textile Design, Motifs, Styles, Repeats, Layouts. Construction of designs from incomplete repeats (Woven, knitted, Net and braided fabric)

Factors influencing selection of fabric: Special consideration in designing and layout of the garment for prints, stripes, checks, pile fabric. Handling of special fabric while cutting and stitching. (Deep pile, lace, velvet, chiffon, knits, leather) Supporting Fabrics: Interlining, Interfacing, Underlining: their functions and application

Fashion designers: History and look into design concepts of famous designers, both Indian and International.

References:

1. Allen and Seaman, "Fashion drawing- The Basic Principles", B. T Batsford, London, 1994
2. Drake and Ireland, Patrick *John*, "Fashion Design Drawing and Presentation", B. T, Batsford, London, 1996
3. Nicholas, "Fashion illustrations", Thames and Hudson. London, J 994
4. Seamn, Julian, "Professional Fashion Illustration". B. T. Batsford, London, 1995
5. Erwin Model, *Clothing for Moderns* , Mac Millan Publications, New York (1994).
6. Tate and Sharon Lee, *Inside fashion design* , Harper Publication Inc., UK (1976).

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-211 SOCIOLOGICAL AND PSYCHOLOGICAL ASPECTS OF CLOTHING

Credits:3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Origin and development of costume: Origin of clothing, Functions of clothing. Types of ornament used in the beginning. Tattooing and mutilation and other method of skin decoration.

Theories of clothing: theory of modesty, immodesty, protections, adornment, combined need theory, other theories in fashion.

SECTION-B

Relation between clothing and other disciplines: Physical Health, Mental Health Clothing and first impressions, Personality and self-concept. Behaviour and clothing choices, practices and effects of clothing on the individual.

Motivation in clothing choices: Individual values, interests and attitudes related to clothing.

SECTION-C

Psychological aspects of clothing: For adolescent adults, old age and childrens : self-respects, human dignity, emotional response, sex desirability and self-expression.

Importance of colour in clothing: Sex differences in use of colour, Colours for different occasions and ceremonies. Religion and culture.

SECTION-D

Sociological aspects of clothing: changes in society and culture. Clothing influenced by religion and regional basis, role of uniform, occupational clothes, national clothes. Class distinction and socio-economics status. Family and social influencing. National Costumes of different counties Philippines, china, Burma, Arabia, India, Pakistan, (Study of Indian Sarees.)

References :

1. Akari Roshan : Ancient Indian Costumes, New Delhi, Art Heritage.
2. Devaport Millia : The Book of costumes, Vol. I, II , New York, Coroun Publishers.
3. Eoan CC : Costumes throughout the ages, New York J. B. Limancott.
4. Ghweey G.S.Indian Costume. Bombay Popular Prakashan, ,1951
5. Kemper Racher : The History of costumes
6. Laver James : Costume through the ages, New York, Simon and schustar 1968
7. Moti Chandra : Costumes Textiles Cosmetics Costumes in Ancient and Medieval, New Delhi Orient Publishers 1973.
8. J.C. Fluger-The Psychology of clothing
9. Mahal D. Erooin : Clothing for modern colliar Mac Millan Publisher.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-204

NATURAL FIBER AND FABRIC DYEING LAB Credits: 0-0-3

Max. Marks: 75

- Natural, Direct, Reactive, Vat, Sulphur and Indigo on cellulosic fibres (Cotton, Viscose, etc).
- Natural, Reactive, Pigment, Acid, Basic, Metal complex and Mordant dyeing of Wool.
- Natural, Acid, Metal complex and Mordant dyeing of Silk
- Effect of different parameters and auxiliaries on the above dyeing processes.
- Stripping of dyed materials and re-dyeing.
- After-treatments of dyed materials for improvement of fastness properties.

References:

1. Giles Laboratory Course in Dyeing by David G. Duff and Roy S. Sinclair, Fourth Edition, 1989. The Society of Dyers and Colorists, UK.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-205

TEXTILE PHYSICAL TESTING LAB

Credits: 0-0-3
Max. Marks: 75

- Fabric analysis: identification of warp and weft, of ends per inch, picks per inch, count and crimp of warp & weft and GSM of the fabric.
- Weave analysis: determination of weave of the fabric, to draw point paper design of the weave along with the drafting, lifting and denting plan.
- Analysis of knitted fabric for knit, wales & courses per inch, yarn count and crimp and fabric weight.
- To determine the wash fastness of the dyed fabric to machine wash.
- To determine fastness to water of the dyed fabric.
- To determine the fastness of the dyed fabric to acidic and alkaline perspiration
- To determine sublimation fastness of the dyed fabric
- To determine dry & wet rubbing fastness of the dyed fabric.
- To determine fastness of dyed fabric against direct sunlight.
- To determine the pilling resistance of the fabric by ICI Pill-Box method.
- To determine the abrasion resistance and pilling tendency of the fabric by Martindale abrasion tester.
- To determine the tensile strength of the fabric- warp & weft ways.
- To study the effect of change in length of the specimen on the tensile strength of the fabric (both warp & weft ways)
- Determination of garment accessories testing - Button, Snap pull test, zipper test, seam strength test.
- To determine the fabric crease recovery using crease recovery tester.
- To determine the fabric stiffness by stiffness tester
- To determine the Yarn twist by yarn twist tester
- To determine the fabric bursting strength.

References:

1. Principles of Textile Testing by J.E. Booth
2. IWS Testing Manuals
3. Handbook of Textile Testing by Grover & Hamby

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-206

TEXTILE CHEMICAL TESTING LAB-II

Credits: 0-0-2
Max. Marks: 50

- To determine the cloud point of given non-ionic detergent
- To determine the biochemical oxygen demand (BOD) of given wastewater sample
- To determine the chemical oxygen demand (COD) of given wastewater sample
- To determine the solid content and active content of an anionic/cationic surfactant in terms of molarity
- To determine the solid content and active content of binder
- To determine the solid content and silicon oil content in silicon emulsion.
- To determine the compatibility of different dye combination
- To determine the strength of given dye and compare with the different lots of same dye
- Compare the performance of new wetting agent with conventional wetting agent
- To determine the pH of given fabric
- To determine the nature of Fabric finish
- To determine the oil/grease content in the given wool sample by Soxhlet method

References:

1. Evaluation of Textile Chemicals Vol. VIII by V.A.Shenai and R.H. Mehra.
2. Vogel's textbook of quantitative inorganic analysis by J. Bassett.
3. Process House laboratory- A Handbook by Girish Luthra, Bapu Dehspande, MANTRA.
4. Handbook of Textile Testing (PartI,IV), Bureau of Indian Standards.
5. Detergent Analysis (Handbook for cost effective quality control) by B.M. Mildwidsky & D.M. Gabriel.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - IV)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-207

Summer Training

Credits-0-0-1

Students will be required to undertake Practical Training in Industrial establishment and will have to submit a Industrial Training Report along with original certificate at the completion of the training. Every student will be required to submit a training report in typed standard prescribed format containing a copy of original certificate. The objective of the industrial training is to test the ability of the student to grasp the industrial environment in the field of Textile processing. Every student will make PowerPoint presentation of industrial training and will be orally examined in the context of the training report.

**The students should undergo summer training at the end of 4th Semester.
The result will be satisfactory (S) or unsatisfactory (US).**

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-301 SYNTHETIC DYEING TECHNOLOGY

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Machines for Dyeing Synthetics: The thermosol method. The pad-roll system. Pressure beam dyeing machines: Principle of pressure beam dyeing and its parts. Jet dyeing and soft-flow machines, fully flooded jet machines, low liquor ration reel-jet dyeing machines.

SECTION-B

Technology of Acrylic Dyeing: Introduction, use of cationic dyes, effect of pH, electrolyte and temperature of dye adsorption, effect of water on PAN fibres, Carrier dyeing, Retarding agents in acrylic dyeing, dye-fibre characteristics, Migrating cationic dyes, Gel dyeing, Dyeing of acrylic using disperse dyes.

SECTION-C

Technology of Polyester Dyeing: Introduction, role of heat setting, Use of disperse dyes, effect of dispersing agents on dye adsorption, effect of leveling agents on dye adsorption, effect of temperature on dye adsorption, isomorphism, oligomers, carrier dyeing, solvent assisted dyeing, solvent dyeing, high temperature dyeing, thermofixaion and after clearing.

SECTION-D

Technology of Nylon Dyeing: Introduction, role of heat setting, Use of anionic dyes: Barre effects, Acid dyes, mordant dyes, direct dyes and reactive dyes, use of cationic dyes, use of non-ionic dyes viz. disperse dyes, disperse reactive dyes, azoic colorants and vat dyes.

References:

1. Engineering in Textile Coloration Edited by C. Duckworth (1983 Edition), Chapter 1 Pages 1-68. The Dyers Company Publication Trust, Distributed by the Society of Dyers and Colorists (SDC), UK.
2. Chemical Principles of Synthetic Fibre Dyeing by S.M. Burkinshaw (1995 Edition). Blackie Academic and Professional (Chapman and Hall), UK.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-302

TEXTILE TESTING-II

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Evenness Testing: Random and periodic variations, short, medium and long term variations, index of irregularity, limit irregularity, reduction of irregularity by doubling, electronic capacitance evenness testing- the 'Uster Evenness tester', material speed, chart speed and chart contraction, the choice of measuring capacitor, normal and inert testing, imperfection indicator, photoelectric tester.

SECTION-B

Fabric Dimensions and Fabric Properties: Measurement of fabric length, width, thickness, and fabric weight per unit area and per unit length. Threads per inch in woven fabric, crimp of yarn in fabric, definition, crimp and fabric properties, the measurement of crimp percentage. Fabric crimp, yarn count and fabric thickness relationship. Definition of air permeability, air resistance and air porosity, and measurement of air permeability. Thermal properties of fabric. fabric stiffness, drape and handle. The 'Shirley' stiffness tester, bending length, flexural rigidity and bending modulus. crease resistance and crease recovery. Flammability-definitions, factors affecting flame resistance. Waterproof, Shower-proof and Water-repellent fabrics, wettability. Methods of testing – wetting time test, spray test, drop penetration test, Bundesmann test. The penetration of fabrics by water under pressure, the 'Shirley Hydrostatic Head' test, the water percolation test, sinking test, wetting by wicking test. Shrinkage test-relaxation and felting shrinkage, testing for shrinkage.

SECTION-C

The Tensile Testing of Textiles: Definitions, load, breaking load, stress, mass stress, tenacity or specific stress, breaking length, strain, extension, breaking extension, the load-elongation curve, the stress-strain curve, initial Young's modulus, Yield point. 'Work of Rupture', Factors affecting the tensile properties of textiles and the results obtained from testing instruments. CRE, CRL, CRT and CR Stress methods of loading, the yarn strength testing- lea test, C.S.P. skein breaking tenacity, single thread test. Fabric Strength testing- objectives, the hydraulic bursting strength tester, the strip and Grab test, tearing strength, the ballistic tear test, the Elmendorf tearing tester.

Garment and garment accessories testing: Testing of fusible interlinings, zippers, elastic Waist band, sewing threads, buttons, snap fasteners, wear testing. Tensile properties of seams and stitches, zipper strength test, dimensional stability of garment.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

SECTION-D

Serviceability, Wear and Abrasion Resistance: Purpose of serviceability testing-abrasion and wear, flat, edge and flex abrasion. Testing of abrasion resistance conditioning of specimen, choice of testing instrument, the pilling of fabrics, I.C.I. pilling box test and Martindale abrasion tester.

Modern fabric quality testing: Fabric quality evaluation by objective measurement: Kawabata and FAST systems of testing: Fabric Assurance by Simple Testing (FAST 1,2,3,4 tests),

References:

1. Principles of Textile Testing by J.E. Booth Published by CBS Publishing Company, New Delhi.
2. Introduction to Garment Manufacture by G. Cooklin (Blackwell Sciences).

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-303 INTRODUCTION TO FABRIC MANUFACTURE

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Clearing, Doubling and Winding: Objects of clearing, doubling and winding. Twist and twist direction effects, Z on Z Vs Z on S twists balanced and unbalanced yarns, ply, cord and cable yarns, resultant count calculation for ply & cord yarns. Fancy yarns- definition of Boucle, gimp and loop yarns, eccentric or slub gimp yarns, snarl yarn, knop yarn, spiral or corkscrew yarn, chenille yarn, slub yarn, cloud yarn and flock yarn. Introduction to mechanical & electronic yarn clearers, doubling machines (Ring Doublers and TFO) and their comparison. Introduction to autoconer. General introduction to various methods of fabric manufacturing (woven, knitted, braided, lace and net fabrics, felts and non-wovens).

SECTION-B

Weaving Preparatory: Warping and sizing-their objects and machines for the same.

Weaving: Primary, secondary and auxiliary motions of a loom, types of shuttle and shuttleless looms, definition of bottom closed, center closed, semi-open and open shed.

Fabric Construction and Design: Construction of cloth design, classification of weaves (plain weave, twill weave, satin and sateen weave and their derivatives-ribbed effects, mock rib, matt weave, waved twills, herringbone twill, elongated twill, diamond weave) crepe weave, stripe & check effects, lappet, swivel, gauze & leno weaves, pile fabrics-cut & uncut – terry, velvet and corduroy fabrics, combination of two weaves, types of selvages.

SECTION-C

Knitting: Introduction, advantages and disadvantages of knitted fabrics over woven fabrics. Knitting stitches (plain stitch, purl stitch, miss stitch and tuck stitch). Classification of knitted fabrics (weft knit, warp knits). Classification of weft knitted fabrics – plain, rib purl and interlock knit fabrics, Warp knitted fabrics. Defects in knitted fabrics, knits in use, advantages and disadvantages of specified knitted fabric types, weft insertion knits and their advantages.

SECTION-D

Felts and Non-Woven: Definition, dry and wet laid webs, spun and melt blown webs, parallel, cross and random laid webs, adhesive bonding, needle punched fabrics, stitch-bonded fabrics, thermally bonded fabrics, reinforced felts, nonwovens in use. Fabrics formed from non-fibrous materials.

References:

1. Textiles – Fibre to Fabric by Bernard P. Corbman (Latest Edition) Chapter 4, Published by McGraw Hill Book Company, New Delhi.
2. Textiles by A. Wyne–The Motivate Series, Published by Macmillan,

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-304

PRINTING TECHNOLOGY-I

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Traditional Methods: Block printing, and engraved roller printing.

Screen-printing: Hand screen printing, semi-automatic and fully automatic screen printing, rotary screen printing. Design aspects: design selection, repeat sketch, colour separation, step and repeat. Screen production: the photochemical process, flat screens, rotary screens. half-tone and multi-tone printing and laser engraving.

SECTION-B

Transfer Printing: Sublimation transfer, selection of paper, printing methods, dyes and inks, the mechanism of sublimation transfer, sublimation transfer on natural fibres. Melt transfer printing, film release transfer printing, wet transfer printing. The fundamental mechanism of screen printing.

SECTION-C

Direct Print Coloration: Pigment Printing: Pigment dispersions, binder systems, thickening systems, pigment printing pastes, advantages and limitations of pigment printing. Pigment printing of polyester / cotton blend. Printing of Cellulosic fibres, printing of polyester/cotton blend with a mixture of dyes: Disperse and reactive dyes, disperse and vat dye, special brands of dyes. Printing of polyester fibres, cellulose acetate fibres, acrylic fibres, polyamide fibres and proteins fibres.

SECTION-D

Azoic Colour Printing: Introduction. Methods of printing: base printing method: Naphthol printing method: Naphthol Nitrite Padding Method: Naphthol Nitrite Printing Method: Fast Bases.

References:

1. Textile Printing Edited by Leslie W.C. Miles (1994 Edition). Chapters (1-8). Published by Society of Dyers and Colourists, Bradford.
2. An Introduction to Textile Printing by W. Clarke, Newnes – Butterworths

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-305

FINISHING TECHNOLOGY-I

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction to finishing: Wet and dry or chemical or mechanical finishing, application of chemical finishes, drying wet textiles, curing chemical finishes, shearing and cropping, Calendaring, Emerising, Raising, Sanforization.

SECTION-B

Application Methods: Dip and nip padding, the padding mangle, Coating and lamination.

Stenters: Pin and clip stenters rails, fabric entry into stenter, drive system, fabric delivery, heating in stenters, hot flues, contact heating, perforated suction drums, continuous steamers for dye fixation.

SECTION-C

Hand Building Finishes: Introduction, the hand building effect, examples of textiles with hand building finishes, typical hand builder chemistry, evaluation methods, trouble shooting.

Softening finishes: Mechanism of the softening effect, cationic softeners, amphoteric soft finishes, non-ionic soft finishes, anionic soft finishes, reactive soft finishes, silicones, typical softened textile articles, product types and their chemistry, compatibility and combinability, evaluation and testing.

SECTION-D

Easy care and Durable press finishing of cellulose: Introduction, easy care properties, easy care technology, mechanism of easy care and durable press finishing, chemistry of easy care and durable press finishes, application methods, formaldehyde free easy care finishes, compatibility with other finishes, evaluation methods

References:

1. Textile Finishing, (Ed.) Derek Heywood Society of Dyers and Colorists, 2003.
2. Chemical Finishing of Textiles, by W D Schindler and P J Hauser, Woodhead Publishing Ltd, Aug 2004.
3. Handbook of Fiber Science and Technology: Volume II, Chemical Processing of Fibers and Fabrics Functional Finishes Part-A and Part B, edited by Menachem Lewin and Stephen B. Sello.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-301

SYNTHETIC DYEING LAB

Credits: 0-0-3

Max. Marks: 75

- Dyeing of acrylic with different dye classes.
- Dyeing of polyester with different dye classes.
- Dyeing of nylon with different dye classes.
- Effect of different parameters and auxiliaries on the above dyeing processes.
- Determination of washing fastness of dyes of the above dye classes.

Reference:

1. Giles Laboratory Course in Dyeing by David G. Duff and Roy S. Sinclair, Fourth Edition, 1989. The Society of Dyers and Colorists, UK.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - V)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-302

PRINTING LAB

Credits: 0-0-3
Max. Marks: 75

- Printing of cotton with Direct, Reactive, Vat, sulphur dyes & pigments.
- Printing of wool with acid & metal complex dyes.
- Printing of polyester with disperse dyes & pigments.
- Printing of various blends e.g. polyester/cotton, polyester/wool and other available blends.
- Printing of textile fabrics with different styles of printing i.e. Direct, discharge & resist.

References:

1. Textile Printing Edited by Leslie W. C. Miles (1994 Edition).
2. An Introduction to Textile Printing by W. Clarke, Newnes – Butterworths.
3. The Thames & Hudson Manual of Textile Printing by Joyee Storey (1974 Edition).

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-306 PROCESSING OF BLENDS

CREDITS 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction: Classification of blends: Objectives of blending. Classification, compatibility of components in a blend.

Blend dyeing methods: Single bath single step, single bath two step and two bath two step methods to produce different shades. Blend dyeing shades: Reserve, cross, shadow and solid shades. Possibilities of producing various shades on a specific blend.

SECTION-B

Dynamic competition between fiber types in the dyeing of blends: Introduction, distribution of acid dyes on nylon/wool blends, nylon/polyurethane blends, cross-staining of wool by disperse dyes and basic dyes, the transfer of disperse dyes during thermofixation of polyester/cellulosics blends.

Minimizing incompatibility between dyes from different classes: Interaction between disperse dyes and reactive dyes, interaction between disperse dyes, vat dyes and basic dyes, interaction between anionic dyes and basic dyes.

SECTION-C

Introduction: Characterization of fibre, blends, dyeing of primary, binary and ternary blends, viz. A, B, D, A-B, A-D, D-B and A-D-B.

Dyeing of cellulosic blends: Dyeing of cellulosic-wool, cellulosic-cellulosic, cellulosic-silk, cellulosic-polyester, cellulosic-nylon and others.

SECTION-D

Dyeing of Wool blends: Dyeing of wool-silk, wool-polyester, wool-acrylic and others.

Dyeing of other blends: Polyester/Acrylic, nylon/polyester, nylon/acrylic, silk/polyester, silk/nylon, silk/acrylic and others.

Reference:

1. Blends Dyeing Edited by John Shore (1998 Edition). Chapters 1-15. The Society of Dyers and Colorists (SDC), UK.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-307

PRINTING TECHNOLOGY-II

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Discharge printing: Print pastes for discharge printing, problems in discharge printing, application procedures in discharge printing: vat discharges on cellulosic fibres, pigment illuminated discharges, discharges on wool and silk, discharges on secondary cellulose acetate and cellulose triacetate, discharge and discharge-resist processes on polyester fibre, discharges on nylon, acrylic fibres and polyester cellulose blends.

SECTION-B

Resist printing: Resists under aniline black, resists under reactive dyes, vat resists under vat dyed grounds, resists under azoic colorants, resist printing of wool.

Special styles: Africa prints, bleeder styles, crimp style and burnt-out styles.

SECTION-C

The production and properties of printing pastes: The basic requirements of thickeners, raw materials, viscous emulsions, synthetic -polymer thickeners, print paste production.

Fixation and after treatment processes: Fixation of pigment prints, Steamers: batch and continuous steamers, mechanism of fixation processes, dye fixation in steam, high temperature steaming, miscellaneous techniques. Washing off processes and equipment's.

SECTION-D

Digital Printing-Trends & Technique. Introduction, Trends in use of textile printing machines, Merits of digitalization, Inkjet printing, Continuous stream printing, Drop-on-demand, Bubble jet, Valve jet, machinery range in digital printing.

Quality and Process control in Printing: General, Tests for the suitability of thickener in the print paste formulation and other concepts.

References:

1. Textile Printing Edited by Leslie W.C. Miles (1994 Edition). Chapters (1-8). Published by Society of Dyers and Colourists, Bradford.
2. An Introduction to Textile Printing by W. Clarke, Newnes – Butterworths
3. Process & Quality Control in Chemical Processing – ATIRA Tablet.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-308

APPAREL PRODUCTION

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Apparel production: Introduction about apparel industry, Process flow of Apparel industry, role of different department in the Apparel industry, Seams- types, end use, stitch dimension, performance as per ASTM standards.

Merchandising: Introduction. Dimensions of product change. Nature and timing of merchandising responsibilities – line planning, line development, product development and line presentation.

Materials Sourcing and Selection: Introduction. Role of sourcing in an apparel industry. Materials sourcing processes. Selection of fabrics. Predicting aesthetics and performance. Evaluation of fabric quality.

SECTION-B

Sampling department- importance of sampling department, objectives, types of sample prototype, fit sample, pp sample, size set, production sample, shipment sample. Introduction to Spec sheet and its importance, Technical design reading, Tech pack analysis & objective, creating tech pack.

Cutting department: Machineries, fabric spreading, pattern laying, grading, marker preparation, sorting, numbering & bundling, fusing department- methods of fusing, fusing machines

SECTION-C

Production department: selection of production system- progressive bundle system, unit production system, modular manufacturing, piece work. Production planning, Linear manufacturing process. Finishing & pressing department, trimming department, packing department.

Apparel accessories & components: fasteners, labels, support materials, decorative trims, tapes & packing materials.

SECTION-D

In process quality inspection: objectives methods, advantages, inspection methodology, final inspection, random inspection, general inspection method for shirts, trouser and kids garments.

Introduction to export documentation: objectives, terminologies, principle documents, auxiliary documents, risk cover, insurance, ECGC, quality control and pre-shipment inspection, export credit, short, medium, long term credit, packing credit, negotiation of bills, payment procedures in export trade.

References:

1. Chutler A J, Introduction to clothing Production Management, Blackwell Science, 1998
2. Harold Carr & Barbara Latham, the Technology of Clothing Manufacture, Oxford Pub. USA, 1994
3. Rajesh Bheda, Managing productivity in the Apparel Industry, CBS pub., New Delhi. 2003
4. Ruth E G, Grace I Kunz Apparel Manufacturing Sewn Product analysis UK, 2005

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-309

FINISHING TECHNOLOGY-II

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Water repellency and waterproofing: Introduction, theory of wetting and repellency, fabric construction and preparation for water repellent finishing, water repellent finishes other than fluorochemicals, fluorochemical repellent finishes, repellent finishes, test methods for water repellency, oil repellency and stain resistance.

Flame retardant finishes: Introduction, hazards of burning textiles, burning and flame retardancy, Mechanisms of flame retardancy, Flame retardant chemistry, Evaluation of flame retardants

SECTION-B

Anti-static and Soil release finishes: Mechanism of antistatic finishes, chemistry of antistatic finishes, evaluation of antistatic finishes, mechanism of soil release, soil-release chemistry, evaluation of soil release.

Antimicrobial finishes: Introduction, properties of an effective antimicrobial finish, Mechanisms of antimicrobial finishes, Chemistry of antimicrobial finishes, Evaluation of antimicrobial finishes.

Insect resist and mite protection finishes: Application of insect resist finishes, Evaluation of insect resist finishes troubleshooting insect resist finishes- Finishes for protection from dust mites.

SECTION-C

Ultraviolet protection finishes: Introduction, Mechanism of UV protection, Chemistry of UV protection finishes, Evaluation of UV protection finishes.

Quality and Process control in Finishing: Optimization of finishing parameters to impart various finishes on different fibres. Processes, machines and quality of chemicals

SECTION-D

Recent Development in Finishes: Nano finishing, Microencapsulation, Plasma treatment, Fragrance finishes, Camouflage.

References:

1. Textile Finishing, (Ed.) Derek Heywood Society of Dyers and Colorists, 2003.
2. Chemical Finishing of Textiles, by W D Schindler and P J Hauser, Woodhead Publishing Ltd, Aug 2004.
3. Handbook of Fiber Science and Technology: Volume II, Chemical Processing of Fibers and Fabrics Functional Finishes Part-A and Part B, edited by Menachem Lewin and Stephen B. Sello.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-310 FASHION RETAILING, MARKETING AND MERCHANDISING

Credits 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Fashion retailing: History, Scope, Importance, Types (Domestic and International), techniques, Types of retailers and ownerships:- specialty stores, department stores, mass stores, promotional stores, multiple-unit store (chain, department store group), retail organization (small and large store), discount retailing, mail order houses. Elements of retail mix.

Retail strategies: value directed retailing, service oriented retailing, unique merchandising, shopping as entertainment, main street retailing, global expansion.

SECTION-B

Retail pricing: role of price decision within marketing strategies, external and internal factors influencing price decision, main methods of setting prices, pricing strategies for new products, price changes.

Record keeping: unit control, inventory and physical control.

Marketing: Introduction, types, four P's, fashion promotion advantages, trade shows, Market weeks, exhibitions, fashion shows, market survey and research.

SECTION-C

Buying Behavior: Factors influencing buying behavior, Stages of decision buying process. Marketing Strategy: Strategic Planning. Competitive Marketing Strategies.

Market Segmentation: Levels. Patterns. Procedure. Effective segmentation. Market targeting. Product Life Cycle: Concept. Marketing strategies for various stages of life cycle. New Product Development: Stages of new product development.

Product and Branding Strategy: Product-line decisions-product-line analysis, product-line length and line modernization, Featuring and Pruning. Brand decisions – branding challenges, brand-name decision, brand – building tools, brand strategy decision, brand asset management and brand auditing and repositioning. Packaging and Labeling.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION-D

Introduction to customer relationship management: measuring customer relationship management, customer response, satisfaction, loyalty, customer relation and complaint management.

Retail merchandiser: introduction, concept, quick response, Just –in-Time, merchandiser calendar, trend analysis, forecast analysis, concepts of apparel product line, planning, directing, coordinating and controlling.

Visual Merchandising-Interior, exterior window display, store planning and layout-fixtures, location, lighting, dressing, props and promotions, masking and proscenia, mannequins and three dimensional dressing

Fashion promotion: Planning and direction, Fashion advertising: - kinds of advertising, co-operative advertising, scheduling and planning, media. Publicity: - campaigning, special events and fashion shows.

References:

1. Laura L Bliss, Study Guide Visual Merchandising and Display III edition, Fairchild Publications, 1995
2. Castelino, M. Fashion Kaleidoscope, Rupa & Co. 1994.
3. Gibson, G. Vedomani, Retail Management, Jaico Publishing House, Bangalore
4. Elaine Stone, The Dynamics of Fashion, Fair Child Publication, 1999
5. Brenda Sternquist, International Retailing, Fairchild Publication, New York
6. Frings, Gini Stepes, “Fashion: from Concept to Consumer”, Pearson publication, 6th edition.
7. Ellen diamond, “Fashion Retailing”, Pearson publication, 2nd edition.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-311

GREEN PROCESSING OF TEXTILES

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Eco Standards and Eco-Labels: Regulations concerning azo dyes- banned amines, Pesticides, Heavy metals, Formaldehyde and Pentachlorophenol in textiles. Global eco standards and eco-labels. Ecomark scheme of India. Criteria for an ecolabel based on the life cycle.

SECTION-B

Eco-Management: Concept of eco-management, eco audit, certification and labeling of ecofriendly textiles concept of Organic textiles.

Eco-Testing of Textiles: Testing of banned chemicals such as free formaldehyde, pesticides, pentachlorophenol, heavy metals, azo dyes containing aromatic amines & benzidine and halogen carriers. Principle of Instruments used – Chromatography (HPLC, GC) and Mass Spectrometry and Atomic Absorption/Emission Spectrometry.

SECTION-C

Approach to Eco-Friendly Processing: Concept of Sustainable Textiles, Fibre origin, Approach and Alternative methods/chemicals in Pretreatments, Eco-friendly dyes and dyeing, Eco-Friendly Finishing – formaldehyde free finishing, Halogen free FR finish, Comfort and Hygiene Finishing using natural agents like Neem - Aloe vera – Chitosan for anti-microbial finishing.

Electrochemical reduction - Ultrasonic dyeing. Concept of low level application of chemicals.

SECTION-D

Enzymatic Processing of Textiles: Enzyme treatments: Enzymes in preparatory processes - desizing, scouring, bleaching – Amylase, pectinase, protease, catalase, lipase etc. Enzymes used as discharging agents in printing – Laccase, Enzymes used in finishing – Bio finishing by cellulase. Enzymes for surface modification of natural and synthetic fibres.

References:

1. **GOTS** standard manuals
2. *Eco -Textiles, Special Report*, The Bombay Textile Research Association, Mumbai, 1996.
3. *Eco-Friendly Textiles: Challenges to the Textile Industry*, Textiles Committee, Mumbai, 1996.
4. Chavan R B and Radhakrishnan J, *Environmental Issues - Technology Options for Textile Industry*, IIT Delhi Publication, 1998.
5. Asokan R, *Eco-Friendly Textile Wet Processing*, NCUTE Publications, New Delhi, 2001.
6. Cavaco-Paulo A and Gübitz G M, *Textile Processing with Enzymes*, Woodhead Publishing Ltd., UK, 2003.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-312

TECHNICAL TEXTILES

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction: Definition and scope for technical textiles, History of technical textiles, present and future status of technical textiles, application areas of technical textiles.

Coating and lamination textiles: Introduction, Chemistry of coated textiles, Material used for coating, substrate used for coating, Methods of coating, Physical properties of coated textiles and application of coated textiles.

Textile reinforced composite materials: Introduction to composite material, Textile reinforced structure, Woven structure, knitted, braided and its application in different areas.

SECTION-B

Filtration textiles: introduction, theory of dust collection and solid-liquid separation, filtration requirements, concept of pore size and particle size, role of fiber, fabric construction and finishing treatments.

Geotextiles: Brief idea about geosynthetics and their uses, essential properties of geotextiles, geotextile testing and evaluation, application examples of geotextiles.

Medical textiles: introduction, classification of medical textiles, description and basic requirements of material used for medical textiles.

SECTION-C

Protective Clothing: Brief idea about different type of protective clothing, functional requirement of textiles in defense including ballistic protection materials, thermal insulation, Biological and chemical warfare protection, water proof breathable fabrics and high attitude fabrics.

Sports and recreation textiles: Functional requirement of different type of product and their construction. Application areas like Synthetic turfs, sports equipments, accessories and apparel.

Automotive Textiles: Application of textiles in automobiles, requirement and design for different tyres, airbags and belts, methods of production and properties of textiles used in these applications like railways, aeroplane, marine etc.

SECTION-D

Sewing threads, cords and ropes: Types, method of production and applications, functional requirements, structure, properties and application like parachute and bridge.

(4)

Other uses of technical textile: Functional requirements and types of textiles used for papermaking, agricultural, Sound insulation electronics, power transmission belting, hoses, canvascovers and tarpaulins.

(6)

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-303

FINISHING LAB

Credits: 0-0-3

Max. Marks: 75

- Softening and stiffening finishes.
- Carbonizing of wool and polyester/cotton fabrics.
- Crease-resistance finishing of cotton and viscose fabrics.
- Crease-resistance finishing of polyester/cotton and polyester/viscose fabrics.
- Determination of free formaldehyde in resin finished fabrics.
- Optical brightening agent finishes and washes.
- Enzyme wash with cellulase.
- Softener Wash
 - Cationic Softener
 - Silicone Softener
 - Polyurethanes
 - Polyethylene
 - Non Ionic
- Stone wash after detergent wash
- Stone wash with Hypochlorite
- Stone wash with KMnO_4
- Stone wash with Cellulase.
- Ice wash (thermocool balls treated with KMnO_4)

References:

1. Chemical Finishing of Textiles, by W.D. Schindler and P.J. Hauser, Woodhead Publishing Ltd, August 2004.
2. Textile Finishing, (Ed.) Derek Heywood, Society of Dyers and Colorists, 2003.
3. Handbook of Fiber Science and Technology: Volume II, Chemical Processing of Fibres and Fabrics Functional Finishes Part-A and Part-B, Edited by Menachem Lewin and Stephen B. Sello.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCP-304

BLEND PROCESSING LAB

Credits: 0-0-3

Max. Marks: 75

1. Pretreatment of different blends (P/C, P/V, P/W, W/A etc) like desizing, scouring, bleaching.
2. To conduct dyeing of all available blends of textile fibres such as cotton, viscose, polyester, wool, nylon, acrylic, silk, lycra.
3. To apply all possible dyeing methods such as single bath dyeing of two components as well as two bath-two stage dyeing of two components of a blend.
4. To optimize the dyeing parameters w.r.t temperature, time, role of auxiliaries etc.
5. To develop all possible shade types such as solid shade and contrast of the constituting components of a blend.
6. To develop semi-cont. dyeing protocols on Pad mangle.
7. To develop different shades and to match these with standards.

References:

1. Blends Dyeing Edited by John Shore (1998 Edition). Chapters 1-15. The Society of Dyers and Colorists (SDC), UK.
2. Chemical Technology in the Pre-treatment Processes of Textiles by S.R. Karmakar, Published by Elsevier Publications, The Netherlands.
3. Textile Printing Edited by Leslie W.C. Miles (1994 Edition). Chapters (1-8). Published by Society of Dyers and Colourists, Bradford.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VI)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCP-305

**INDUSTRIAL TRAINING
(6 weeks)**

Credit: 0-0-4

Students will be required to undertake Practical Training in Industrial establishment and will have to submit a Industrial Training Report along with original certificate at the completion of the training. Every student will be required to submit a training report in typed standard prescribed format containing a copy of original certificate. The objective of the industrial training is to test the ability of the student to grasp the industrial environment in the field of Textile processing. Every student will make PowerPoint presentation of industrial training and will be orally examined in the context of the training report.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-401 HUMAN RESOURCE MANAGEMENT

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Human Resource Management: Concept, Nature, Scope, Objectives, Functions of HRM, HRD & HRM, Role of HR Manager, structure of HRM dept. Duties & Responsibilities of HR Manager, Challenges before HRM.

Human Resource Planning: Concept, Need and Importance; Human Resource Planning Process; Job Enlargement, Job Enrichment, Job rotation, Factors affecting HRP; Barriers to HRP.

Manpower Planning: Objectives, Need, Importance, Short & Long term Manpower Planning,

Job Analysis: Meaning and Objective, Process, Methods of Collecting job data, Uses of Job Analysis, Problems of Job Analysis.

SECTION-B

Job Design: Concept, Factors affecting Job Design, Techniques of Job Design.

Recruitment: Concept, Factors affecting Recruitment, Sources, Techniques and Problems associated with Recruitment.

Selection: Concept, Process, Tests, Interviews and Barriers to effective Selection.

Induction and Orientation: Concept, Process, Benefits and Problems associated with Induction and Orientation.

SECTION-C

Managing Careers: Concept, Promotion, issues related to Promotion; Demotion- Concept, Purpose and issues related to Demotion; Transfer- Concept, Purpose and issues related to Transfer.

Compensation: Elements of Compensation, Base Compensation, factors Affecting Compensation, Fringe Benefits, Time Wage and Piece Wage Systems.

Training & Development: Training Need, system approach to training, Education, Training & Development, Methods of training and development.

Performance Appraisal: Need, objectives, Ethics & Concept of Performance management, methods of Performance Appraisal, Errors of Appraisal, Promotion, Transfer.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

SECTION-D

Succession Planning: Concept, Objectives, Internal versus external succession planning, Succession Planning Model, Challenges in the absence of succession planning, Strategies for accelerating development for succession.

Employee Separation and Retention: Concept, Types of Employee separations, Factors Responsible for High Employee Turnover, Managing Early Retirements, Lay-offs and Voluntary Turnover, Outplacement.

Managing Diversity: Concept, Approaches to Managing Diversity, Challenges in managing employee diversity, Diversity Training.

Tools to improve managerial effectiveness: Kaizen, Quality circles, Time management, SWOT Analysis, Worker's Participation in Management: Concept and Evolution.

References:

1. Gomez-Mejia, Balkin and Cardy. "Managing Human Resources", PHI Learning Private Limited.
2. K. Aswathapa. "Human Resource and Personnel Management: Text and Cases", New Delhi, Tata McGraw-Hill.
3. Pravin Durai. "Human Resource Management" Pearson Education.
4. Gary Dessler. "Human Resource Management" Pearson Education.

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

TCL-402 : WASTE MANAGEMENT & POLLUTION CONTROL IN TEXTILE INDUSTRY

Credits 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction: Basic understanding of terms such as pollution, industrial pollution, waste, point and non point sources, impact of textile industry on environment (Air, water & soil), toxicity of dyes & processing chemicals, Industrial hygiene & safety.

Spinning waste: Its generation, classification, its re-use and management. Soft waste, hard waste. Different types of pollution in spinning industry.

SECTION-B

Weaving waste: Its generation, different types, its re-use and management. Different types of pollution in weaving industry. Its impact on human being.

Textile waste water characteristics: Chemical nature of discharged bath after each process, contribution of chemicals to the waste water load. Concept of biological and chemical oxygen demand

Textile waste water problem: Effect of waste-water on sewage and land.

SECTION-C

Chemical used in textile industry: Toxicity of various chemicals, viz alkalis, oxidizing and reducing agents, acids, carriers, resins and bleaching agents etc. Role of each chemical on waste water load.

Treatment of textile effluents: Primary, secondary and tertiary treatments in ETP. Colour removal, various chemicals used in ETP.

Effluent Testing: Testing of BOD, COD, TOC and interpretation of results.

SECTION-D

Waste Management: Waste reduction, reducing pollution in textile dyeing, recycling and reuse of dyestuffs and chemicals, waste minimization by using eco-friendly technologies for textile processing such as ecofibres, environmental friendly chemical processing, minimization of chemical usage

Environmental Regulation and Environmental Management Systems: Regulatory measures for environmental management- Environmental (protection) Act, 1986, The environmental (protection) rules, 1986, International standards-ISO-14000, Discharge standards for textile industrial effluents, Environmental management systems (EMS) and Asset Management (AM), REACH (Registration, Evaluation, Authorization and Restriction of Chemicals).

B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024

References:

1. Asolekar S, *Environmental problems in chemical processing of textiles* 1st Ed. NCUTE, Department of Textile Technology, IIT-Delhi, 2000.
2. Padma Vankar, *Textile Effluents*, 1st Ed. NCUTE, Department of Textile Technology, IIT-Delhi, 2002.
3. Edmund B, *The Treatment of Industrial Wastes*, 2nd Ed. McGraw-Hill Kogakusha, New Delhi, 1976
4. R.M. Christie-*Environmental Aspects of Textile Dyeing*, Woodhead Publishing Limited, Cambridge, England, 2007..
5. S.R. Karmakar, *Chemical Technology in The Pre-treatment Processes of Textiles*, Elsevier Publications, The Netherlands.
6. A.S. Bal, *Wastewater Management for Textile Industry—An Overview*, Indian J. Environ. Hlth. 41(4), 264-290, 1990.
7. ISI Standards for Effluent Treatment in Textile Industries.
8. Vaidya A A, *Production of Synthetic fibres*, Prentice-Hall India Ltd, New Delhi, 1988.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL- 403

GARMENT PROCESSING TECHNOLOGY

Credits: 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Garment Technology: Brief outlook of garment manufacturing industry and its classification. Sewing machine and its components, functions of different parts of sewing machine. Types of threads for stitching of garments.

SECTION-B

Garment Processing Machinery: Introduction to the machinery used for garment processing, its differences / similarities with the machinery used for fabric processing. Principles, sketches and working of wash-wheel, hydro extractor and dryers used in garment processing

Garment Dyeing Machines: Side-paddle machines, overhead paddle machines, Rotating Drum machines, Tumblers, High temperature garment dyeing machines, dye boarding machines

SECTION-C

Machine-Washable Knitwear Production Routes: Introduction, scouring and milling procedures for woolen spun knitwear, scouring and anti-cockle procedures for worsted Spun knitwear, garment shrink-resist treatment for knitwear.

Garment Printing: Introduction, selection of dye classes, printing methods, block printing, roller printing, rotary printing, manual screen printing, flat belt printing, transfer printing, pigment printing, trends in garment printing, foam or raise binder, leathery or plastic printing, khadi printing, metallic print Gold, silver, copper print, Fluorescent & Phosphorescent printing, pearl printing, glitter printing, thermo colour printing and label printing

SECTION-D

Garment Finishing: Removal of stains, DP Garments, Permanent silting of woolen garments, wash-n-wear garments, novelty effects, Denim washes: Chemical washes, short gun and sand blasting treatments, etc.

Defects and Remedies: Occurrence of defects in the processing of garments and its remedial measures shall be discussed

References:

1. Engineering in Textile Coloration Edited by C. Duckworth (1983 Edition), Chapter 1 Pages 1-68. The Dyers Company Publication Trust, Distributed by the Society of Dyers and Colorists (SDC), UK.
2. Chemistry of the Textiles Industry, C.M. Carr.
3. Printing by W.C. Miles.
4. Introduction to Garment Manufacture by G. Cooklin (Blackwell Sciences).

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCL-404

QUALITY CONTROL IN TEXTILES

Credits 3-0-0

Time: 3 hours

Max. Marks: 75

Mid Semester Examination: 20% weightage

Mid Semester Examination: 80% weightage

Instructions for the Paper Setters:

Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section

Note: Students can use the Non-Programmable scientific calculator.

SECTION-A

Introduction: Definition of Quality, Dimensions of quality, quality planning, and importance of quality. Tools of quality control: flow chart, brain storming, fish bone diagram, check sheets, bar graph, charts, Pareto analysis, histogram, scatter diagram

TQM principles: Customer satisfaction, customer perception of quality, Intrinsic & Extrinsic quality, service quality, customer retention, continuous process improvement, Juran Trilogy, PDSA cycle, 5S, Kaizen, TPM, 6 sigma and Lean manufacturing.

SECTION-B

Managing quality: Traditional vs Modern quality management, Quality control (QC), objectives of QC and inspection, Quality Assurance (QA), QA system,

Importance of Quality control: Quality assurance parameters like Fabric dimensions, shrinkage and colour fastness, Fabric defects in manufacturing processes like knitted, woven, dyeing and printing. Fabric inspection and identification of woven and processing defects, 4 point & 10 point system, IPQC, AQL standards

SECTION-C

Quality inspection in garments: Major inspection points to be verified in a final inspection for Men's Shirt & Trouser, Ladies Top, Trouser, Skirt and Kids Garment.

Care labeling: International care labeling system, Japan/ Canada/ British care labeling system, Eco labels.

SECTION-D

Quality system: Need for ISO 9000, Major elements in ISO 9001-2000, internal auditing, Environmental Management system, ISO 14000 series standards, Environmental Management programme, and other quality management standards of Apparel industry, AATCC, ASTM--standards, significance & importance of the same. Zero defects, JIT, Poka-yoke and quality circle.

References:

1. Chutler A J, Introduction to Clothing Production Management, Blackwell science, UK, 1998
2. Control, ASCQ quality Press, Marcel Dekker Inc, New . York, 1992
3. Gerry Cooklin, Introduction to Clothing manufacture, Blackwell science, UK, 1991
4. Harold Carr & Barbara Latham, The Technology of Clothing Manufacture, Oxford pub., ITSA, 1994,46
5. Pradip V Mehta, Quality Control in Apparel Industry, NIFT pub., New Delhi, 2001
6. J V Rao (2008) Quality Evaluation. NITRA.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCP-401

SEMINAR

Credits: 0-0-2

Max. Marks: 50

Topic of seminar will be decided by faculty members of textile processing stream. Every student will be required to submit a Seminar write up in typed standard prescribed format along with references. The objective of the Seminar is to improve presentation skills and confidence level of the students. Every student will make PowerPoint presentation on seminar topic and will be orally examined in the context of the seminar topic.

**B.TECH. TEXTILE PROCESSING TECHNOLOGY (CBEGS) (SEMESTER - VII)
SYLLABUS FOR THE BATCH FROM THE YEAR 2020 TO YEAR 2024**

TCP- 402

RESEARCH PROJECT

Credits: 0-0-6

Every student will be required to submit a project report in typed standard format on a topic set by one or more teachers. The objective of the Project Work is to test the ability of the student to tackle an investigational problem in his field of specialization. Every student will make PowerPoint presentation of related with project and will be orally examined in the subject incorporated in his Project Report.

TCP 403

INDUSTRIAL TRAINING (6 MONTHS)

CREDITS: 0-0-20

Students will be required to undertake Practical Training in Industrial establishment and will have to submit a Industrial Training Report along with original certificate at the completion of the training. Every student will be required to submit a training report in typed standard prescribed format containing a copy of original certificate. The objective of the industrial training is to test the ability of the student to grasp the industrial environment in the field of Textile processing. Every student will make PowerPoint presentation of industrial training and will be orally examined in the context of the training report.