

FACULTY OF SCIENCES

SYLLABUS

FOR

B.Tech. (Textile Processing Technology) **(Credit Based Evaluation & Grading System)** **(Semester: I - IV)**

Examinations: 2019-20



GURU NANAK DEV UNIVERSITY **AMRITSAR**

- Note:** (i) **Copy rights are reserved.**
Nobody is allowed to print it in any form.
Defaulters will be prosecuted.
- (ii) **Subject to change in the syllabi at any time.**
Please visit the University website time to time.

B. Tech. (Textile Processing Technology)
(Credit Based Evaluation & Grading System)

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.	ENL-101	Communicative English-I	2	0	0	2
6.		Elective-I	2	0	0	2
7.	MEP101	Workshop Practices	0	0	2	2
List of Electives–I:						
1.	PBL121	Punjabi (Compulsory) OR	2	0	0	2
2.	* HSL101	Punjab History & Culture OR	2	0	0	
3.	* PBL122	ਮੁੱਢਲੀ ਪੰਜਾਬੀ	2	0	0	
4.	** SOA 101	Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)	3	0	0	
Total Credits:			16	2	5	23

Note:

1. * Special Paper in lieu of Punjabi Compulsory, For those students who are not domicile of Punjab
2. ** Student can opt this Paper whether in 1st or 2nd Semester.

B.Tech. (Textile Processing Technology)
(Credit Based Evaluation & Grading System)

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
List of Electives–II:						
1.	PBL131	Punjabi (Compulsory) OR				2
2.	* HSL102	Punjab History & Culture (1717-1947) OR	2	0	0	
3.	* PBL132	ਮੁੱਢਲੀ ਪੰਜਾਬੀ	2	0	0	
4.	** SOA 101	Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)	3	0	0	
Total Credits:			16	3	3	23

Note:

1. * Special Paper in lieu of Punjabi Compulsory, For those students who are not domicile of Punjab
2. ** Student can opt this Paper whether in 1st or 2nd Semester.

B.Tech. (Textile Processing Technology)
(Credit Based Evaluation & Grading System)

Semester –III					
Course code	Subject	Credits	L	T	P
TCL-201	Pretreatment Technology	4	3	1	0
TCL-202	Color Science	3	3	0	0
TCL-203	Fibre Science	4	3	1	0
TCL-204	Yarn Manufacturing	4	3	1	0
TCP-201	Pretreatment Lab	3	0	0	3
TCP-202	Computer Color Matching Lab	3	0	0	3
TCP-203	Textile Chemical Testing Lab-I	2	0	0	2
IDC	**Interdisciplinary Course- I	4	4	0	0
*ESL-220	Environmental Studies (Compulsory)	4	4	0	0
Total Credits		30 (26+4)	19	3	8

Note :

1. ****PSL-053 ID Course Human Rights & Constitutional Duties (Compulsory Paper)**
Students can opt. this paper in any odd semester. This ID Paper is one of the total ID Papers of this course.
2. ***Credits will not be included in the total.**

B.Tech. (Textile Processing Technology)
(Credit Based Evaluation & Grading System)

Semester –IV					
Course code	Subject	Credits	L	T	P
TCL-205	Fabric Manufacture Process	4	3	1	0
TCL-206	Natural Fiber and Fabric Dyeing	4	3	1	0
TCL-207	Textile Testing	4	3	1	0
TCL-208	Green Processing of Textiles	3	3	0	0
*SOA-101	Drug Abuse: Problem, Management and Prevention (Compulsory ID Course)	3	0	0	3
Department Elective courses (select any one out of TCL-209 or TCL-210)					
TCL-209	Textile and Fashion Design	3	3	0	0
TCL-210	Statistical Control Techniques for Textile Industry	3	3	0	0
TCP-204	Natural Fiber and Fabric Dyeing Lab	3	0	0	3
TCP-205	Textile Testing Lab	3	0	0	3
TCP-206	Textile Chemical Testing Lab-II	2	0	0	2
**IDC	Interdisciplinary Course- II	4	4	0	0
Total Credits		31 (27+4)	20	3	8

***Only for those students who admitted in Lateral Entry scheme.**

** Interdisciplinary Course- II (Only for Regular Students, not for students admitted under Lateral Entry Scheme. Students admitted under Lateral Entry Scheme will choose SOA-101 as Interdisciplinary Course in place of Interdisciplinary Course- II).

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

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/Demineralization methods. Numerical problems based on Lime-Soda and Zeolite softening methods.	3

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

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) 1st Semester
(Credit Based Evaluation & Grading System)*

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 KMnO₄ solution with oxalic acid
7. Find the strength of KMnO₄ 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 surfacetension 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 / Reference Books:

1	Engineering Chemistry by P.C. Jain & Monica Jain Dhanpat Rai Publishers, NewDelhi.2014.
2	Physical Chemistry by A. Peter and J.de. Paula 10 th 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) 1st Semester
(Credit Based Evaluation & Grading System)*

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 –

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) 1st Semester
(Credit Based Evaluation & Grading System)*

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) 1st Semester
(Credit Based Evaluation & Grading System)*

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 1 st 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
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

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

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.

Suggested / Reference Books:	
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.
3	Electrical Machines by Bhattacharya SK; Tata McGraw Hill, Delhi.
4	Basic Electrical Engineering by T.K. Naggarkar& 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.

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

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) 1st Semester
(Credit Based Evaluation & Grading System)*

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) 1st Semester
(Credit Based Evaluation & Grading System)*

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) 1st Semester
(Credit Based Evaluation & Grading System)*

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

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. 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
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

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

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

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) 1st Semester
(Credit Based Evaluation & Grading System)*

ENL-101: COMMUNICATIVE ENGLISH

Credits: 02 (L= 2, T=0, U=0)

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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) 1st Semester
(Credit Based Evaluation & Grading System)*

PBL 121: ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ - I

Time: 3 Hours

Credit: 2-0-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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-ਦੋ

- I. **ਦੋ ਰੰਗ** (ਸੰਘਾ ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਭਾਈ ਵੀਰ ਸਿੰਘ
(ਅ) ਧਨੀ ਰਾਮ ਚਾੜ੍ਹਕ
(ੲ) ਪ੍ਰੋ. ਪੂਰਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਗੁਰਮੁਖੀ ਔਰਥੋਗਰਾਫੀ ਦੀ ਜੁਗਤ (ਪੈਂਤੀ, ਮੁਹਾਰਨੀ, ਬਿੰਦੀ, ਟਿੱਪੀ ਤੇ ਅੱਧਕ); ਵਿਸਰਾਮ ਚਿੰਨ੍ਹ, ਸ਼ਬਦ ਜੋੜ (ਸੁਧ-ਅਸੁਧ)

ਸੈਕਸ਼ਨ-ਬੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਘਾ ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਫਿਰੋਜ਼ਦੀਨ ਸ਼ਰਫ
(ਅ) ਪ੍ਰੋ. ਮੋਹਨ ਸਿੰਘ
(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. **ਦੋ ਰੰਗ** (ਸੰਘਾ ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਨੰਦ ਲਾਲ ਨੂਰਪੁਰੀ
(ਅ) ਅਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ
(ੲ) ਡਾ. ਹਰਿਭਜਨ ਸਿੰਘ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਸ਼ੁੱਧ, ਅਸ਼ੁੱਧ : ਦਿੱਤੇ ਪੈਰ੍ਹੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦਾਂ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ
(15 ਪੈਰ੍ਹਿਆਂ ਦੇ ਸ਼ੁੱਧ ਅਸ਼ੁੱਧ ਅਭਿਆਸ ਕਰਵਾਉਣੇ)

ਸੈਕਸ਼ਨ-ਡੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਘਾ ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਵੀ :
(ੳ) ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ
(ਅ) ਸੁਰਜੀਤ ਪਾਤਰ
(ਕਵੀ ਦਾ ਜੀਵਨ, ਕਵਿਤਾ-ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਾਵਿ-ਕਲਾ)
- II. ਅਖਬਾਰੀ ਇਸਤਿਹਾਰ : ਨਿੱਜੀ, ਦਫ਼ਤਰੀ ਤੇ ਸਮਾਜਕ ਗਤੀਵਿਧੀਆਂ ਨਾਲ ਸੰਬੰਧਤ

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

**HSL–101: Punjab History & Culture (1450-1716)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)**

Time: 3 Hours

Credits: 2-0-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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) 1st Semester
(Credit Based Evaluation & Grading System)*

**PBL-122: ਮੁੱਢਲੀ ਪੰਜਾਬੀ
(In lieu of Punjabi Compulsory)**

Credits: 2-0-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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।

ਪਾਠ-ਕ੍ਰਮ

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 ਪੈਰੇ ਵਿੱਚੋਂ ਅਸ਼ੁੱਧ ਸ਼ਬਦ ਨੂੰ ਸ਼ੁੱਧ ਕਰਨਾ।
ਸਮਾਨਾਰਥਕ ਤੇ ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ

ਸੈਕਸ਼ਨ-ਡੀ

ਹਫਤੇ ਦੇ ਸੱਤ ਦਿਨਾਂ ਦੇ ਨਾਂ, ਬਾਰਾਂ ਮਹੀਨਿਆਂ ਦੇ ਨਾਂ, ਰੁੱਤਾਂ ਦੇ ਨਾਮ, ਇਕ ਤੋਂ ਸੌ ਤੱਕ ਗਿਣਤੀ ਸ਼ਬਦਾਂ ਵਿੱਚ।

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

**DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(COMPULSORY ID COURSE)**

(Student can opt this Paper in 1st or 2nd Semester)

SOA: 101–PROBLEM OF DRUG ABUSE

Time: 3 Hours

Credit 3-0-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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

Meaning of Drug Abuse:

- (i) Meaning, Nature and Extent of Drug Abuse in India and Punjab.
- (ii) Consequences of Drug Abuse for:
 - Individual : Education, Employment, Income.
 - Family : Violence.
 - Society : Crime.
 - Nation : Law and Order problem.

Section – B

Management of Drug Abuse:

- (i) Medical Management: Medication for treatment and to reduce withdrawal effects.
- (ii) Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
- (iii) Social Management: Family, Group therapy and Environmental Intervention.

Section – C

Prevention of Drug Abuse:

- (i) Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
- (ii) School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

Section – D

Controlling Drug Abuse:

- (i) Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
- (ii) Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

*B.Tech. (Textile Processing Technology) 1st Semester
(Credit Based Evaluation & Grading System)*

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism*. Harmond Worth: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, “*Punjab’s Drug Problem: Contours and Characteristics*”, Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

*B.Tech. (Textile Processing Technology) 2nd Semester
(Credit Based Evaluation & Grading System)*

Course Name	:	Engineering Mechanics
Course Code	:	CEL-120
Credits (L-T-P)	:	4 (3-1-0)
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.

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 indeterminacy, 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) 2nd Semester
(Credit Based Evaluation & Grading System)*

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) 2nd Semester
(Credit Based Evaluation & Grading System)*

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

*B.Tech. (Electronics & Communication Engineering) 2nd Semester
(Credit Based Evaluation and Grading System)*

SECTION - D		
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) 2nd Semester
(Credit Based Evaluation & Grading System)*

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) 2nd Semester
(Credit Based Evaluation & Grading System)*

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.

*B.Tech. (Textile Processing Technology) 2nd Semester
(Credit Based Evaluation & Grading System)*

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:

- 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
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; Schrodinger 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) 2nd Semester
(Credit Based Evaluation & Grading System)*

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) 2nd Semester
(Credit Based Evaluation & Grading System)*

Course Name	:	Introduction to Engineering Materials
Course Code	:	MEL110
Credits (L-T-P)	:	3 (3-0-0)
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.

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	11
SECTION - B		
2	Lattice structure: Bravais lattices, unit cells, crystal structures, crystal planes and directions, co-ordination number. Single crystals, polycrystalline, non-crystalline, nanocrystalline 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) 2nd Semester
(Credit Based Evaluation & Grading System)*

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.).

B.Tech. (Textile Processing Technology) 2nd Semester
(Credit Based Evaluation & Grading System)

PBL 131: ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ-II

Time: 3 Hours

Credit: 2-0-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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-ਦੋ

- I. **ਦੋ ਰੰਗ** (ਸੰਖਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਨਾਨਕ ਸਿੰਘ : **ਭੂਆ**
(ਅ) ਗੁਰਮੁਖ ਸਿੰਘ ਮੁਸਾਫਿਰ : **ਬਾਗੀ ਦੀ ਧੀ**
(ੲ) ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ : **ਪੇਮੀ ਦੇ ਨਿਆਣੇ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰ : ਧਾਤੂ/ਮੂਲ, ਵਧੇਤਰ (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਵਿਉਂਤਪਤ ਅਤੇ ਰੁਪਾਂਤਰੀ), ਸਮਾਸ।

ਸੈਕਸ਼ਨ-ਬੀ

- I. **ਦੋ ਰੰਗ** (ਸੰਖਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਸੁਜਾਨ ਸਿੰਘ : **ਬਾਗਾਂ ਦਾ ਰਾਖਾ**
(ਅ) ਕਰਤਾਰ ਸਿੰਘ ਦੁੱਗਲ : **ਤੈਂ ਕੀ ਦਰਦ ਨਾ ਆਇਆ**
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਪੈਰ੍ਹਾ ਰਚਨਾ : ਕਲਾਸ ਵਿੱਚ 10 ਵਿਸ਼ਿਆਂ (ਸਭਿਆਚਾਰ, ਧਾਰਮਕ ਅਤੇ ਰਾਜਨੀਤਕ) 'ਤੇ ਪੈਰ੍ਹਾ ਰਚਨਾ ਦੇ ਅਭਿਆਸ ਕਰਵਾਉਣੇ।

B.Tech. (Textile Processing Technology) 2nd Semester
(Credit Based Evaluation & Grading System)

ਸੈਕਸ਼ਨ-ਸੀ

- I. ਦੋ ਰੰਗ (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਕੁਲਵੰਤ ਸਿੰਘ ਵਿਰਕ : ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ
(ਅ) ਨਵਤੇਜ ਸਿੰਘ : ਦੂਜੀ ਵਾਰ ਜੇਬ ਕੱਟੀ ਗਈ
(ੲ) ਪ੍ਰੇਮ ਪ੍ਰਕਾਸ਼ : ਲੱਛਮੀ
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- 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. ਦੋ ਰੰਗ (ਸੰਪਾ. ਹਰਜਿੰਦਰ ਸਿੰਘ ਢਿੱਲੋਂ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਰਗੋਧੀਆ)
ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਯੂਨੀਵਰਸਿਟੀ, ਅੰਮ੍ਰਿਤਸਰ ਵਿੱਚੋਂ ਹੇਠ ਲਿਖੇ ਕਹਾਣੀਕਾਰ :
(ੳ) ਅਜੀਤ ਕੌਰ : ਬੁੱਤ ਸ਼ਿਕਨ
(ਅ) ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ : ਬੱਸ ਕੰਡਕਟਰ
(ਕਹਾਣੀਕਾਰ ਦਾ ਜੀਵਨ, ਕਹਾਣੀ ਸਾਰ, ਵਿਸ਼ਾ-ਵਸਤੂ, ਕਹਾਣੀ ਕਲਾ)
- II. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ, ਸੰਬੰਧਕ

B.Tech. (*Textile Processing Technology*) 2nd Semester
(*Credit Based Evaluation & Grading System*)

HSL–102: Punjab History & Culture (1717-1947)
(Special paper in lieu of Punjabi Compulsory)
(For those students who are not domicile of Punjab)

Time: 3 Hours

Credits: 2-0-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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 Readings:

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) 2nd Semester
(Credit Based Evaluation & Grading System)

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

Credits: 2-0-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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।

ਪਾਠ-ਕ੍ਰਮ

ਸੈਕਸ਼ਨ-ਏ

ਸਬਦ ਸ੍ਰਣਾਅ : ਪਛਾਣ ਅਤੇ ਵਰਤ

(ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਾਰਆ ਵਸ਼ਸ਼ਣ)

ਸੈਕਸ਼ਨ-ਬੀ

ਨਤ ਵਰਤ ਦਾ ਪਜਾਬਾ ਸ਼ਬਦਾਵਲਾ : ਬਾਜ਼ਾਰ, ਵਪਾਰ, ਰਿਸ਼ਤੇ-ਨਾਤੇ, ਖੇਤੀ ਅਤੇ ਹੋਰ ਧੰਦਿਆਂ ਨਾਲ ਸਬੰਧਤ ।

ਸੈਕਸ਼ਨ-ਸੀ

ਪੰਜਾਬੀ ਵਾਕ-ਬਣਤਰ

ਸਾਧਾਰਨ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤ)

ਸੰਯੁਕਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਮਿਸ਼ਰਤ-ਵਾਕ (ਪਛਾਣ ਅਤੇ ਵਰਤੋਂ)

ਸੈਕਸ਼ਨ-ਡੀ

ਪਰ੍ਹਾ ਰਚਨਾ

ਸੰਖੇਪ ਰਚਨਾ

B.Tech. (*Textile Processing Technology*) 2nd Semester
(*Credit Based Evaluation & Grading System*)

**DRUG ABUSE: PROBLEM, MANAGEMENT AND PREVENTION
(COMPULSORY ID COURSE)**

(Student can opt this Paper in 1st or 2nd Semester)

SOA–101: PROBLEM OF DRUG ABUSE

Time: 3 Hours

Credit 3-0-0

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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

Meaning of Drug Abuse:

- i. Meaning, Nature and Extent of Drug Abuse in India and Punjab.
- ii. Consequences of Drug Abuse for:

Individual	:	Education, Employment, Income.
Family	:	Violence.
Society	:	Crime.
Nation	:	Law and Order problem.

Section – B

Management of Drug Abuse:

- i. Medical Management: Medication for treatment and to reduce withdrawal effects.
- ii. Psychiatric Management: Counselling, Behavioural and Cognitive therapy.
- iii. Social Management: Family, Group therapy and Environmental Intervention.

Section – C

Prevention of Drug Abuse:

- i. Role of family: Parent child relationship, Family support, Supervision, Shaping values, Active Scrutiny.
- ii. School: Counselling, Teacher as role-model. Parent-teacher-Health Professional Coordination, Random testing on students.

B.Tech. (Textile Processing Technology) 2nd Semester
(Credit Based Evaluation & Grading System)

Section – D

Controlling Drug Abuse:

- i. Media: Restraint on advertisements of drugs, advertisements on bad effects of drugs, Publicity and media, Campaigns against drug abuse, Educational and awareness program
- ii. Legislation: NDPs act, Statutory warnings, Policing of Borders, Checking Supply/Smuggling of Drugs, Strict enforcement of laws, Time bound trials.

References:

1. Ahuja, Ram (2003), *Social Problems in India*, Rawat Publication, Jaipur.
2. Extent, Pattern and Trend of Drug Use in India, Ministry of Social Justice and Empowerment, Government of India, 2004.
3. Inciardi, J.A. 1981. *The Drug Crime Connection*. Beverly Hills: Sage Publications.
4. Kapoor. T. (1985) *Drug epidemic among Indian Youth*, New Delhi: Mittal Pub.
5. Kessel, Neil and Henry Walton. 1982, *Alcoholism*. Harmond Worth: Penguin Books.
6. Modi, Ishwar and Modi, Shalini (1997) *Drugs: Addiction and Prevention*, Jaipur: Rawat Publication.
7. National Household Survey of Alcohol and Drug abuse. (2003) New Delhi, Clinical Epidemiological Unit, All India Institute of Medical Sciences, 2004.
8. Ross Coomber and Others. 2013, *Key Concept in Drugs and Society*. New Delhi: Sage Publications.
9. Sain, Bhim 1991, *Drug Addiction Alcoholism, Smoking obscenity* New Delhi: Mittal Publications.
10. Sandhu, Ranvinder Singh, 2009, *Drug Addiction in Punjab: A Sociological Study*. Amritsar: Guru Nanak Dev University.
11. Singh, Chandra Paul 2000. *Alcohol and Dependence among Industrial Workers*: Delhi: Shipra.
12. Sussman, S and Ames, S.L. (2008). *Drug Abuse: Concepts, Prevention and Cessation*, Cambridge University Press.
13. Verma, P.S. 2017, “*Punjab’s Drug Problem: Contours and Characteristics*”, Economic and Political Weekly, Vol. LII, No. 3, P.P. 40-43.
14. World Drug Report 2016, United Nations office of Drug and Crime.
15. World Drug Report 2017, United Nations office of Drug and Crime.

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

TCL-201 : PRETREATMENT TECHNOLOGY

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

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.

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

SECTION-A

Shearing, Cropping and 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.

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-B

Scouring: Introduction, Scouring of cotton, details of the scouring process, Efficiency of kier boiling, Estimation of degradation of cotton undergone during scouring. Modern kiers, methods of heating, circulation of liquor, batch and continuous scouring, Vaporloc unit. J-boxes, scouring of coloured woven goods. Enzymatic scouring, basic principles involved in enzymatic scouring, comparison with conventional scouring, Solvent scouring, dry-cleaning.

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

SECTION-C

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, Application of FBAs to fibres, Yarns & Fabrics, Assessment of bleaching performance, Whiteness index, Yellowness index.

Wool Scouring: 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

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.

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*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

TCL-202 : COLOR SCIENCE

Credits: 3-0-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

SECTION-A

Introduction to the Physical Basis and Measurement of Color: Introduction, Measurement of light intensity, color temperature, Daylight and the CIE standard illuminants: standard illuminants and standard sources, sources of artificial light, the tungsten filament lamp, tungsten-halogen lamp, xenon lamps and gas discharge tubes, fluorescent lamps and tubes, properties of artificial light sources, color-matching booths and visual color matching, Interaction of light with matter, refraction, surface reflection, light scattering and diffuse reflection, color terms and definitions: hue, strength, depth, dullness and brightness. Light absorption, reflection and color: hue and wavelength position of light absorption, measurement of dye and pigment strength (quantitative analysis of dyes in solution: one component system, two component system and three component system), dullness and brightness characteristics. Light interaction with atoms and molecules.

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.

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

Colorimetry and the CIE System: Introduction, basic principles, additive and subtractive mixing, properties of additive mixing of light, possible color specification system: use of arbitrarily chosen primaries, inadequacy of real primaries, inadequacy of visual observation. Standard observer: color matching functions. 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, 1964 supplementary standard observer (10°), standard illuminating and viewing conditions, standard of reflectance factor, 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, non-uniformity of the CIE system: color differences.

SECTION-C

Color Order Systems, Color Spaces, Color Difference and Color Scales: Color order systems and color spaces: Munsell color-order system: concept and realization. CIE xyY color space etc., various formulae such as CIE 1994 (L*, C*ab, H*ab) color-difference formula, colorists' components of color and color difference. Evaluation of depth and relative depth: colorant strength and standardization, standard depths for fastness testing of colorants, relative cost of colorants, visual assessment of relative strength: single wavelength methods, (K/S) summation methods, methods based on color-order systems and color spaces. Evaluation of fastness-test results. Evaluation of whiteness and yellowness.

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 predication 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*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

TCL-203 : FIBRE SCIENCE

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

SECTION-A

Classification of Textile Fibres: Classification of textile fibres according to their origin and constitution.

Fibre Morphology and Properties of Textile Fibres: 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), approaches to describe fibre fine structure: one and two phase models for natural cellulosic fibres, regenerated and modified celluloses, protein fibres, synthetic fibers.

Natural Fibres:

Cellulosic Fibres: hydrocellulose and oxycellulose, Cotton: Chemical nature, nature of impurities, cotton grading, physical and chemical properties, Flax, linen, jute, ramie, hemp.

Protein Fibres: Composition and nature of impurities, classification of wool, physical and chemical properties. Other hair Fibres: Mohair, Cashmere, Angora, Camel hair, etc. Silk Fibre Properties: fibroin and sericin, sericulture, processing of silk, difference between wool and silk.

SECTION-B

Mineral fibres: Composition, physical and chemical properties.

Man-Made Fibres: Definition, evolution of manufactured fibres, Fibre forming processes, fibre products, production trends, application areas. Physical and Chemicals Properties: PET, Nylon, PP and Acrylic and their comparative studies.

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

Polymerisation: General information about polymers-Types of polymers, polymerization reactions. Production of poly (ethylene terephthalate) polymer-Advantages of TPA over DMT. The chemical reactions for PET preparation. Batch process. Continuous process. Production of nylon 66 polymer, Continuous polymerization process. Production of nylon 6 polymer, Batch process. Continuous process. Integrated continuous process. Production of polymer for making acrylic fibre-Methods 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 cellulosic fibres.

Spin Finishes: 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. Problems encountered during the use of spin finish.

Drawing: The drawing unit, the drawing behavior of thermoplastic polymers, influence of drawing on structure and properties of synthetic fibres, orientation for high strength, high speed spinning and the spin draw process, drawing of pre--oriented yarns and draw warping.

SECTION-D

Texturing: False twist process- Heat setting and yarn texturing. Factors influencing properties of textured yarns. Feed material characteristics. Texturing process variables. Texturing machine design. Draw texturing- Draw texturing machines. The main quality problems in friction twisting. New developments in friction texturing. Air Jet texturing, gear crimping, Stuffer box Texturing, Knife edge crimping. Knit de-knit process.

B.Tech. (*Textile Processing Technology*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

Staple Fibre Production: Melt spinning- advantages and drawbacks of directspinning. Manifold and spin pack. Quenching, finish application and collection of filaments in cans. spinning plants with bigger capacities. Drawing, Heat setting, Crimping etc. in Fibre Line-Drawing of tow. Preliminary heat setting, Crimping, Drying and final heat setting. Cutting. Baling. High production fibre lines. One step continuous plant for the production of melt spun staple fibres. Production of polypropylene staple fibre-Compact or short spinning Plants. Polyester tops for wool blending.

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 the degree of set.

References:

1. Manufactured Fibre Technology, V.B. Gupta and V.K. Kothari, Chapman and Hall, 1997.
2. Production of Synthetic Fibres by A.A. Vaidya, Prentice Hall of India Pvt. Ltd.

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

TCL-204 : YARN MANUFACTURING

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100
Mid Semester Marks : 20
End Semester Marks : 80

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.

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

SECTION-A

Introduction to Spinning: Fibre characteristics and spinnability (staple length, fibre denier, spinning limit, fibre strength, crimp, antistatic and antifriction fibre finish). 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: Objects 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.

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

SECTION-C

Draw Frame: Objects, 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.

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.

SECTION-D

Spinning of Woollen and Worsted Yarns: Fibre specifications, process flow, 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*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

TCP-201 : PRETREATMENT LAB

Credits: 0-0-3

- Desizing of cotton: Acid desizing, Enzymatic desizing, Oxidative desizing, Continuous desizing.
- Desizing of synthetic fabrics and their blends.
- Evaluation of Desizing efficiency.
- Scouring of cotton yarn and cotton fabric - the lime-soda boil, the caustic soda boil, the soda-ash boil, the mixture of caustic soda and soda-ash boil, the soap/detergent-soda-ash boil methods. Emulsion scouring.
- Evaluation of scouring efficiency by Cu number, Methylene blue absorption method and cupramonium fluidity method.
- Bleaching of cotton with NaOCl.
- Effect of pH on the course of hypochlorite oxidation of cellulose.
- Bleaching of cotton with per acetic acid.
- Bleaching of cotton with sodium chlorite.
- Slack and tension mercerization.
- Hot and cold merceriation
- Effect of NaOH concentration, time and temperature on mercerization of cotton.
- Effect of mercerization on dye uptake and other properties of cotton.
- Determination of barium activity number of mercerized cotton.
- Scouring of Raw Wool.
- Chlorination of Wool.
- Effect of chlorination on wool dye uptake and fastness properties.
- Carbonization of wool.
- Reductive bleaching of wool with sodium bisulphate, sodium hydrosulphite, thio-urea etc.
- Bleaching of wool with Potassium Permanganate, H₂O₂.
- Bleaching of nylon, cellulose acetate and acrylic with per acetic acid.
- Bleaching of polyester, nylon with sodium chlorite.
- Bleaching of synthetic fibres and their blends with natural fibres.
- Effect of Heat setting on dye uptake of Polyester.

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*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

TCP-202 : COMPUTER COLOR MATCHING LAB

Credits: 0-0-3

- 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*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

TCP-203 : TEXTILE CHEMICAL TESTING LAB-I

Credits: 0-0-2

- 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 determine the oil/grease content in the given wool sample by Soxhlet method
- To distinguish between Nylon 6 and Nylon 66
- 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
- To determine the pH of given fabric
- To determine the nature of Fabric finish

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) 3rd Semester
(Credit Based Evaluation & Grading System)

ESL-220 : ENVIRONMENTAL STUDIES (COMPULSORY)

Credits: 4-0-0

Teaching Methodologies

The Core Module Syllabus for Environmental Studies includes class room teaching and field work. The syllabus is divided into 8 Units [Unit-1 to Unit-VII] covering 45 lectures + 5 hours for field work [Unit-VIII]. The first 7 Units will cover 45 lectures which are class room based to enhance knowledge skills and attitude to environment. Unit-VIII comprises of 5 hours field work to be submitted by each candidate to the Teacher in-charge for evaluation latest by 15 December, 2019.

Exam Pattern: **End Semester Examination- 75 marks**
 Project Report/Field Study- 25 marks [based on submitted report]
 Total Marks- 100

The structure of the question paper being:

Part-A, Short answer pattern with inbuilt choice – 25 marks

Attempt any five questions out of seven distributed equally from Unit-1 to Unit-VII. Each question carries 5 marks. Answer to each question should not exceed 2 pages.

Part-B, Essay type with inbuilt choice – 50 marks

Attempt any five questions out of eight distributed equally from Unit-1 to Unit-VII. Each question carries 10 marks. Answer to each question should not exceed 5 pages.

Project Report / Internal Assessment:

Part-C, Field work – 25 marks [Field work equal to 5 lecture hours]

The candidate will submit a hand written field work report showing photographs, sketches, observations, perspective of any topic related to Environment or Ecosystem. The exhaustive list for project report/area of study are given just for reference:

1. Visit to a local area to document environmental assets: River / Forest/ Grassland / Hill / Mountain / Water body / Pond / Lake / Solid Waste Disposal / Water Treatment Plant / Wastewater Treatment Facility etc.
2. Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
3. Study of common plants, insects, birds
4. Study of tree in your areas with their botanical names and soil types
5. Study of birds and their nesting habits
6. Study of local pond in terms of wastewater inflow and water quality
7. Study of industrial units in your area. Name of industry, type of industry, Size (Large, Medium or small scale)

B.Tech. (*Textile Processing Technology*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

8. Study of common disease in the village and basic data from community health centre
9. Adopt any five young plants and photograph its growth
10. Analyze the Total dissolved solids of ground water samples in your area.
11. Study of Particulate Matter (PM_{2.5} or PM₁₀) data from Sameer website. Download from Play store.
12. Perspective on any field on Environmental Studies with secondary data taken from Central Pollution Control Board, State Pollution Control Board, State Science & Technology Council etc.

Unit-I

The multidisciplinary nature of environmental studies

Definition, scope and importance, Need for public awareness

(2 lectures)

Unit-II

Natural Resources: Renewable and non-renewable resources:

Natural resources and associated problems.

- (a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- (b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
- (c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
- (d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
- (e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
- (f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
 - Role of an individual in conservation of natural resources.
 - Equitable use of resources for sustainable lifestyles.

(8 Lectures)

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

Unit-III

Ecosystems

- Concept of an ecosystem
- Structure and function of an ecosystem
- Producers, consumers and decomposers
- Energy flow in the ecosystem
- Ecological succession
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

(6 Lectures)

Unit-IV

Biodiversity and its conservation

- Introduction – Definition: genetic, species and ecosystem diversity
- Biogeographical classification of India
- Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
- Biodiversity at global, national and local levels
- India as a mega-diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

(8 Lectures)

Unit-V

Environmental Pollution

Definition

- Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear pollution
- Solid waste management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Pollution case studies
- Disaster management: floods, earthquake, cyclone and landslides

(8 Lectures)

B.Tech. (Textile Processing Technology) 3rd Semester
(Credit Based Evaluation & Grading System)

Unit-VI

Social Issues and the Environment

- From unsustainable to sustainable development
- Urban problems and related to energy
- Water conservation, rain water harvesting, watershed management
- Resettlement and rehabilitation of people; its problems and concerns. Case studies.
- Environmental ethics: Issues and possible solutions
- Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
- Wasteland reclamation
- Consumerism and waste products
- Environmental Protection Act, 1986
- Air (Prevention and Control of Pollution) Act, 1981
- Water (Prevention and control of Pollution) Act, 1974
- Wildlife Protection Act
- Forest Conservation Act
- Issues involved in enforcement of environmental legislation
- Public awareness

(7 Lectures)

Unit-VII

Human Population and the Environment

- Population growth, variation among nations
- Population explosion – Family Welfare Programmes
- Environment and human health
- Human Rights
- Value Education
- HIV / AIDS
- Women and Child Welfare
- Role of Information Technology in Environment and Human Health
- Case Studies

(6 Lectures)

Unit-VIII

Field Work

- Visit to a local area to document environmental assets river/forest/grassland/hill/mountain
- Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds
- Study of simple ecosystems-pond, river, hill slopes, etc

(Field work equal to 5 lecture hours)

B.Tech. (*Textile Processing Technology*) 3rd Semester
(*Credit Based Evaluation & Grading System*)

References:

1. Bharucha, E. 2005. Textbook of Environmental Studies, Universities Press, Hyderabad.
2. Down to Earth, Centre for Science and Environment, New Delhi.
3. Heywood, V.H. & Waston, R.T. 1995. Global Biodiversity Assessment, Cambridge House, Delhi.
4. Joseph, K. & Nagendran, R. 2004. Essentials of Environmental Studies, Pearson Education (Singapore) Pte. Ltd., Delhi.
5. Kaushik, A. & Kaushik, C.P. 2004. Perspective in Environmental Studies, New Age International (P) Ltd, New Delhi.
6. Rajagopalan, R. 2011. Environmental Studies from Crisis to Cure. Oxford University Press, New Delhi.
7. Sharma, J. P., Sharma. N.K. & Yadav, N.S. 2005. Comprehensive Environmental Studies, Laxmi Publications, New Delhi.
8. Sharma, P. D. 2009. Ecology and Environment, Rastogi Publications, Meerut.
9. State of India's Environment 2018 by Centre for Sciences and Environment, New Delhi
10. Subramanian, V. 2002. A Text Book in Environmental Sciences, Narosa Publishing House, New Delhi.

B.Tech. (Textile Processing Technology) 4th Semester
(Credit Based Evaluation & Grading System)

TCL-205 : FABRIC MANUFACTURING PROCESS

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

UNIT – I

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 Doubler 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).

UNIT – II

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.

UNIT – III

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.

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

UNIT – IV

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) 4th Semester
(Credit Based Evaluation & Grading System)

TCL-206 : NATURAL FIBRES AND FABRIC DYEING

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

UNIT-I

Machine for 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, Jig dyeing machines and Winch dyeing machines.

UNIT-II

Pad mangles: 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, The drive, liquor pick-up, safety and uniformity of expression. Vacuum impregnation, Drying prior to fixation.

Cellulosics Dyeing: Introduction, dye structure and properties of dyes used for cellulosic materials (Direct, Reactive, VAT, Sulphur and Azoic dyes), dyeability of cellulose fibres (fibre, yarn and fabric form)

UNIT-III

Method of dyeing (Batch, Semi continuous and continuous), Dye-fibre interaction, mechanism of dye fixation, application and aftertreatment processes. Dyeing processes for cotton, linen, Viscose rayon and Jute etc.

Proteins fibre Dyeing: Introduction, dye structure and properties of dyes used for protein fibres (Acid, Reactive, Metal complex, mordant, direct),

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

UNIT-IV

Dye-fibre interaction with all dye classes, mechanism of dye fixation, application and after treatment processes. Dyeing processes and machines used for Wool and Silk.

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) 4th Semester
(Credit Based Evaluation & Grading System)

TCL-207 : TEXTILE TESTING

Credits: 3-1-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

UNIT – I

Introduction to Testing: The objective of testing, tested quality schemes. Sampling techniques: Random and biased samples, sampling for determination of fiber properties, yarn sampling method- the use of random numbers.

Moisture Relations and Testing: Introduction, regain and moisture content, atmospheric conditions and relative humidity, standard atmosphere, testing atmosphere, affecting the regain of textile materials, absorption and desorption curves. Effects of regain on fibre properties and dimensions. Measurement of regain- correct invoice weight, Shirley moisture meter.

Fibre Dimensions, fineness and maturity: 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, the importance of fibre fineness, definition of fibre fineness, methods of measuring fibre fineness. 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.

UNIT – II

Yarn Dimensions and twist measurement: Linear density, count or yarn number, direct and indirect systems of yarn numbering, tex, denier, English count, woolen & worsted count. Relationship between yarn count and yarn diameter. Twist direction, twist angle, function of twist in the yarn structure, twist and yarn strength, some effects twist on fabric properties, measurement of twist.

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

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.

UNIT – III

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.

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.

UNIT – IV

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.

Garment and garment accessories testing: Testing of fusible interlinings, zippers, elastic waistband, 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*) 4th Semester
(*Credit Based Evaluation & Grading System*)

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) 4th Semester
(Credit Based Evaluation & Grading System)

TCL-208 : GREEN PROCESSING OF TEXTILE

Credits: 3-0-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

UNIT – I

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. Eco-mark scheme of India. Criteria for an eco-label based on the life cycle.

UNIT – II

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.

UNIT – III

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.

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

UNIT – IV

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

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

TCL-209 : TEXTILE & FASHION DESIGN

Credits: 3-0-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

UNIT-I

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.

UNIT-II

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, Boutique, Croquis, Mannequin taste, Fashion icon, fashion follower, muse.

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

UNIT-III

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.

UNIT-IV

Textile designing: Meaning & importance Different techniques/methods of textile designing Elements of Textile Design, Motifs, Styles, Repeats, Layouts, Exploration and Stylization of designs, 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,
2. 1994
3. Drake and Ireland, Patrick *John*, "Fashion Design Drawing and Presentation", B. T,
4. Batsford, London, 1996
5. Nicholas, "Fashion illustrations", Thames and Hudson. London, J 994
6. Seamn, Julian, "Professional Fashion Illustration". B. T. Batsford, London, 1995
7. Erwin Model, –Clothing for Moderns||, Mac Millan Publications, New York (1994).
8. Tate and Sharon Lee, –Inside fashion design||, Harper Publication Inc., UK (1976).

B.Tech. (Textile Processing Technology) 4th Semester
(Credit Based Evaluation & Grading System)

TCL-210 : STATISTICAL CONTROL TECHNIQUES FOR TEXTILE INDUSTRY

Credits: 3-0-0

Time: 3 Hours

Max. Marks: 100

Mid Semester Marks : 20

End Semester Marks : 80

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.

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

UNIT – I

Basic Statistics: A general introduction about the role of statistics in science and technology, Population and sample, different sampling distribution, sampling methods like Random, convenience, stratified, cluster, systematic and selective sampling etc, descriptive and inductive statistics, discrete and continuous variables, collection and classification of data.random variables and probability distribution. comparative study of different types of means and its application, Measures of central tendency, dispersion, Standard deviation, coefficient of Variation, standard error, PMD, skewness and kurtosis.

UNIT – II

Statistical Analysis for Continuous Function: Population and sampling distribution of mean, statistical estimation theory, point's estimates, concept of single tail and double tail test, Student's t distribution, confidence limit, tests of hypotheses and significances, type I and type II errors, difference between two sample means. Test for single variance, Chi-square test, F distribution, test for the difference between two variances, confidence limits for variance and ratio of two variances, choice of sample.

UNIT – III

Statistical Analysis for Discrete Function: Application of binomial and Poisson's distribution, normal approximation, test for a single proportion and difference between two proportions, application of chi-square distribution, contingency table.

Subjective Tests: Rank correlation, tied rank, coefficient of concordance. IV Acceptance Sampling: Basic idea about acceptance sampling, OC curve, producer's risk and customer's risk.

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

UNIT – IV

Control Charts: Advantages using quality control charts, random and assignable causes, and action and warning limits, X, R, p, n p and c chart, Process Capability Ratio (CP and CPK), concept of 6 sigma process control, brief idea about CUSUM and EWMA chart.

Anova and regression: Some basic concepts of analysis of variance, method of least squares, linear regression methodology, correlation and standard error.

References:

1. Principles of Textile Testing by J.E. Booth, newness-butterworths publisher.
2. Handbook of Textile Testing by Grover & Hamby
3. Fundamentals of Statistics by S.C. Gupta, Himalaya Publishing House.
4. Statistical Methods: An introductory text, by I.Medhi, New Age International Pvt. Ltd.
5. Fundamentals of Applied Statistics by S.C. Gupta & V.K. Kapoor, Sultan Chand & Sons Publishers.
6. Theory and problems of Elements of Statistics, Vol.–I, by Stephen Bernstein and Ruth Bernstein.

B.Tech. (*Textile Processing Technology*) 4th Semester
(*Credit Based Evaluation & Grading System*)

TCP-204 : NATURAL FIBRES AND FABRIC DYEING LAB

Credits: 0-0-3

- Application of different classes of dyes on natural fibres/fabrics/yarn. Preparation of dyeings using different hues and different depths on the following classes of dyes:
- Natural, Direct, Reactive, Vat, Sulphur, Azoic, Pigment and Indigo on cellulosic fibres (Cotton, Viscose and bast fibres).
- 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.
- Shade matching of above dye classes.

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*) 4th Semester
(*Credit Based Evaluation & Grading System*)

TCP-205 : TEXTILE TESTING LAB (Physical)

Credits: 0-0-3

- 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 study the difference between sample-to-sample and sample to standard abrasion of fabrics on Martindale abrasion tester
- To study the effect of increase in pressure on the extent of sample-to-sample abrasion obtained on Martindale abrasion tester.
- To study the effect of increase in pressure on the extent of sample-to-standard abrasion obtained on 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.
- 19. 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*) 4th Semester
(*Credit Based Evaluation & Grading System*)

TCP-206 : TEXTILE CHEMICAL TESTING LAB-II

Credits: 0-0-2

- 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 study the effectiveness

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).