சர்தார் வல்லபாய் படேல் சர்வதேச ஜவுளி மற்றும் மேலாண்மை கல்லூரி
सरदार वल्लभभाई पटेल इंटरनेशनल स्कूल ऑफ टेक्सटाइल्स एंड मैनेजमेंट
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B.Sc. – TECHNICAL TEXTILES

REGULATIONS, CURRICULUM & SYLLABUS 2025

INDEX

ABOUT SVPISTM

SVPISTM is a one of its kind institute which is primarily devoted for Textile Management excellence. To cater to the needs of students' community it offers UG and PG programmes in Textiles and Management. With more than 15 years of heritage, SVPISTM has carved a niche in the field of Textile and Management education. Our methodology for producing industry ready candidates and entrepreneurs is based on experiential learning through practical workshops, real-time projects, working alongside with industry professionals as mentors.

This institute is an autonomous entity governed by the Ministry of Textiles, Government of India. All the academic progammes are offered in collaboration with the Central University of Tamil Nadu (CUTN). The core culture and philosophy of SVPISTM is to keep students at the forefront of modern textile and management practices through innovative pedagogy blending theoretical knowledge with practical application to succeed in the global business world.

In the rapidly changing economic and business landscape, need for managers with the global perspective and personal competencies to drive diverse teams has become even more important for organizations. We continually strive on best approach to empower the students to harness their potential strengths and to emerge as positive, well-informed, ethical and confident individuals.

Right from inception we have been training executives, preparing the participants for a world in constant evolution, a world that needs leaders capable of utilizing innovation to turn challenges into opportunities. At SVPISTM, innovation is the way of life.

VISION AND MISSION OF THE INSTITUTE

Vision

To emerge as an internationally renowned center of excellence in textile education, creating a strong cadre of professionals who will become inspiring performers and decision makers, capable of attaining high standards and competitive edge to bring the Indian textile industry to the forefront.

Mission

Our Mission is to impart vibrant, comprehensive and innovative learning to our students enabling them to be managers, entrepreneurs, and leaders with strong cultural values and to provide an ambience to develop their skills to meet the challenges of the global business environment.

I. GOVERNANCE POLICIES

1. STUDENT BEHAVIOUR IN THE CAMPUS

a. Discipline includes the observance of good conduct and orderly behavior by the students of the Institute.

b. The following and such other rules as framed by the Institute from time to time shall be strictly observed by the students of the Institute.
   - ✓ Every student of the Institute shall maintain discipline and consider it his /her duty to behave decently at all places. Men student shall, in particular, show due courtesy and regard to women students.
   - ✓ No student shall visit places or areas declared by the Institute as "Out of Bounds" for the students.
   - ✓ Every student shall always carry on his / her personal Identity Card issued by the Institute.
   - ✓ Every student, who has been issued the Identity Card, shall have to produce or surrender the Identity Card, as and when required by the Institute Staff, Teaching and Library Staff and the Officials of the Institute.
   - ✓ Any Student found guilty of impersonation or of giving a false name shall be liable to meet disciplinary action.
   - ✓ The loss of the Identity Card, whenever it occurs, shall immediately be reported in writing to the class advisor.
   - ✓ If a student is found to be continuously absent from classes without information for a period of 15 days in one or more classes, his / her name shall be struck off the rolls. He/she may, however, be readmitted within the next fortnight on payment of the prescribed readmission fee etc. He / She will not be readmitted beyond the prescribed period.

c. Breach of discipline, interlaid, shall include:
   - ✓ Irregularity in attendance, persistent idleness or negligence or indifference towards the work assigned.
   - ✓ Causing disturbance to a Class or the Office or the Library, the auditorium and the play Ground etc.
   - ✓ Disobeying the instructions of teachers or the authorities;
   - ✓ Misconduct or misbehavior of any nature at the Examination Centre.
   - ✓ Misconduct or misbehavior of any nature towards a teacher or any employee of the Institute or any visitor to the Institute.
   - ✓ Causing damage, spoiling or disfiguring to the property/equipment of the Institute;
   - ✓ Inciting others to do any of the aforesaid acts;
   - ✓ Giving publicity to misleading accounts or rumor amongst the students;
   - ✓ Mischief, misbehavior and/or nuisance committed by the residents of the hostels;

- ✓ Visiting places or areas declared by the Institute r as out of bounds for the students.
- ✓ Not carrying the identity cards issued by the Institute;
- ✓ Refusing to produce or surrender the Identity Card as and when required by Teaching and other Staff of the Institute.
- ✓ Any act of ragging.
- ✓ Any other conduct anywhere which is considered to be unbecoming of a student.
- ✓ Possession and/or use of any prohibited items and substances like tobacco, alcohol, narcotics, etc., is banned inside the campus premises.

d. Students found guilty of breach of discipline shall be liable to such punishment, as prescribed below:
   - ✓ Fine
   - ✓ Campus Ban
   - ✓ Expulsion
   - ✓ Rustication

e. No such punishment shall be imposed on an erring student unless he is given a fair chance to defend himself. This shall not preclude the Director from suspending an erring student during the pendency of disciplinary proceedings against him relating to discipline & disciplinary action in relation to the student shall vest in the Director. However the Director may delegate all or any of his / her powers as he deems proper to the program coordinator or to the disciplinary authority as the case may be any functionary of the Institute.

f. The said Committee, shall, make such Rules as it deems fit for the performance of its functions and these Rules and any other orders under them shall be binding on all the students of the Institute.

g. The decision of the Discipline Committee shall be final and binding. However, in exceptional circumstances the Discipline Committee is empowered to review its decisions.

2. DRESS CODE

Male students shall wear formal dress of pants and tucked-in shirts with shoes. The female students shall wear Salwar Kameez or any modest and professional attire. All students are expected to come in formal dress on important occasions. On any occasion students will not be allowed to attend the classes in T-shirts.

a. Formal Dress Code Policy – Wednesdays

To maintain a professional and disciplined learning environment, all students are required to adhere to a formal dress code every Wednesday. This initiative reinforces the importance of decorum, uniformity, and readiness for professional settings.

b. **Dress Code Guidelines for Wednesdays**:

Boys: Formal shirt (tucked in), formal trousers, belt, and shoes. Clean shave or well-groomed beard is expected.

Girls: Formal salwar kameez, or any modest and professional attire appropriate to the academic environment.

3. LIBRARY

The library is stacked with latest books and reference materials. The library has been provided with the ERP Software having a multi-functional facility. The library holds over 8,000 volumes of books and rich collection of journals. In addition the library possesses audio- visual and multimedia documents. Apart from this, it also provides online sources and reprographic facilities. The library subscribes to online data bases to enhance the knowledge base of students. The time, rules and regulations of library are given below.

a. Library Timings

- ✓ Monday to Friday – 10.00 am to 5.30 pm
- ✓ Saturday (Excluding second & last Saturday of month) – 10.00 am to 4.30 pm

b. Rules and Regulations

- ✓ Students should register their entry and exit to access the Library.
- ✓ Books, bags, and other belongings are not allowed inside the Library.
- ✓ Students are allowed to take maximum of three books for a period of fourteen days. They may be allowed for further renewal if there is no demand for that particular book. If the books are not returned within the due date, Rupee one will be charged per day per book till the return of the books.
- ✓ Reservation facility is available on issued books.
- ✓ Books will be issued upto 5.30 pm on all the working days except Saturdays.
- ✓ ID card should be produced at the time of issuing books.
- ✓ Issue of books through the ID card of other students is strictly prohibited.
- ✓ Loss of book is to be replaced by the same copy or by double the cost of the book.
- ✓ Silence to be maintained inside the library. Group activity to be avoided inside library.
- ✓ Stealing, damaging the property of the library, misbehaviour with any-one in the library will be considered an act of indiscipline and misconduct. The student involved may be denied library membership and reported for further action on account of their misconduct.
- ✓ Any book issued must be shown for verification to the person on duty at the library gate.
- ✓ Marking, defacing or damaging any library property is a gross misconduct.

c. Lending Rules

- ✓ Reference book, journals or magazines, summer training reports or dissertation

reports (including back issues) will not be issued to students. They are to be used only in the Library.

- ✓ The Librarian reserves the right to recall any book issued to the borrower even prior to the due date of return, if necessary.
- ✓ Maximum of three books will be issued to the students for the period of fourteen days.
- ✓ Maximum of five books will be issued to the faculty members for the period of sixty days.
- ✓ If a student fails to return the book on due date or fails to get it re-issued on the due date, a fine of Rupee One per day per book will be charged for each book after the due date.

4. COMPUTER LAB

The institute campus is equipped with networked computers and other IT equipment. Internet browsing with broadband facility is available other than class hours during college working time. Facilities like printing & scanning are also extended to students.

a. I T Guidelines

i. The Institute and its IT resources

The Institute makes Information Technology services available to the students in varied forms:

- ✓ The Institute network comprises of secured network with the latest Hardware, Firewall & Antivirus software.
- ✓ The Institute network comprises DNS Server, ERP Server, and Online e-Learning software with the latest Processor with desktop computers setup.
- ✓ The Institute has centralized computing facility. Audio visual equipment is available in the classroom and in the seminar hall.
- ✓ Access to High-speed internet is available in all the computers except the computers in the class rooms. In addition to this National Knowledge Network Connectivity from BSNL is also available for students.
- ✓ Reprographic facility is made available inside the campus for the students as well as for the faculty members.
- ✓ Scanning facility is available in the Computer Laboratory, Library, Controller's office (Multi-function Device) and Academic section.
- ✓ The computers assigned to the group / department may be utilized effectively by the group on time-share basis.
- ✓ The Faculty, Staff and students are provided with individual user-IDs in the Institution domain server through which they can interact among themselves. Moreover, we have separate individual email-IDs to our faculty and staff for official purpose through the web mail.
- ✓ The group or individual or department are being assigned with the computers or workstations, which means that the individual / department are responsible for the machine's safety. However the IT department may provide suggestions to keep it safe

and in working condition.

- ✓ In case of any requirement, the group / department should provide information about the usage of the computing equipment.
- ✓ The Institute owns Software licenses for various System Software as well as Application software.
- ✓ The Secured Wi-Fi Connectivity is available in the campus as well as in the hostels.

ii. DOs and DON'Ts for using the resources

- ✓ Students must wear a valid ID card before entering the Computer Lab
- ✓ While entering the computer laboratory, students must make an entry in the register book kept in the computer laboratory and also at the time of exit from the lab. Students are expected to maintain perfect silence and good discipline.
- ✓ Students are not allowed to bring in bags, pouches, food and beverages inside the Lab
- ✓ Mobile phone should be in switched off mode.
- ✓ Before leaving lab, students must shutdown the system, keep the place clean and rearrange the chairs in appropriate place.
- ✓ During the class hours students are not allowed to use the computer lab. If necessary, they can get permission from the concerned class faculty, Program coordinator and Lab in charge. They should submit the lab access form to the lab in charge, unless they will not be allowed to enter into the lab.
- ✓ You can back up your data regularly in the additional drives available in the local machine itself.
- ✓ Use of any media (CD / DVD / Pen Drive) or transfer of files from digital camera or any storage media to the network storage is subject to permission from the network administrator. Usage of pen drive is allowed only after scanning for virus.
- ✓ No user is allowed to login a computer as administrator. He / She is only an ordinary user with assigned individual / group user – id.
- ✓ Inform and seek permission from the IT department (recommended procedure) while transferring / shifting devices (such as desktop computers, laptops) from one place to other inside the campus for any task.
- ✓ In case of any requirement in taking laptops / projectors or any devices outside the campus, acquire a gate pass from the administrative office.
- ✓ Do not try getting data of others from the computer or the network.
- ✓ Taking a photograph using any media in the laboratory is prohibited.
- ✓ Do not login with the login-id of others or do not lend your login id and password to others. Any data loss thereby may not be retrieved.
- ✓ The students have to send a request to the library for any hard copy print by listing the file, location and page numbers of the content for print and collect only during the break hours. Users have to enter in the log book and collect the print out. This procedure applies to copying / writing data in CDs also.
- ✓ Students can use their personal computers in the campus. But they are not

permitted to connect to the LAN. Use of software without license in the laptop and accessing the internet through institute network is strictly prohibited. Software piracy will not be entertained.

- ✓ Students are advised to maintain cleanliness inside the laboratory. Use of mobile phones, hearing songs and eatables are not allowed inside the laboratory (to be strictly followed by all the students in the computer laboratory, failing which the services will be denied.)

iii. Storage, e-mail / Chat: Privacy, Responsibilities and Rules

- ✓ IT department has provided every user with a storage space in the network. As network share is available to students of that course, it is a common information sharing only and not to store individual / group's personalized data or irrelevant data like movies, songs etc.
- ✓ SVPISTM procedures allow IT system administrators to view and monitor any files, including e-mail messages, in the course of diagnosing or resolving system related problems and maintaining information integrity. System administrators, as part of the job, will treat any such information on the systems as confidential. However, if the administrator comes across information that indicates illegal activity / content stored in the storage area, the content will be deleted without any notice and the user's work area will be barred.
- ✓ SVPISTM's IT policy prohibits certain other kinds of usages. For example, using computers and the network used by individuals for commercial and individual purposes. Such cases if found will be brought to the attention of higher officials.
- ✓ Use of Messenger / Chat is prohibited inside the campus.
- ✓ Gaming is strictly prohibited. The web sites providing online gaming are not advised to be browsed. Any such activity if reported may block even the related beneficiary sites causing inconvenience to all other users in addition to denial of resources.

iv. Web Site Contents

- ✓ Individual users who are browsing will assume full responsibility for the content in Web pages, and they must abide by all applicable rules and policies of SVPISTM.
- ✓ Information about the institute is available in the institute's official website viz. www.SVPITM.ac.in and www.SVPISTM.ac.in
- ✓ Any information to be uploaded in the website may be provided to the IT department with the approval from the Director's office.

b. Abuse and Action for Abuse of Computing Privileges

i. ABUSE

- Unauthorized use or misuse of IT department property or records includes
  - ➢ Electronic data mishandling.
  - ➢ Willfully or negligently damaging or defacing records in common share or

storage areas of individual courses.

- Theft or unauthorized removal of records, property or other person's property.
- Use of unrecognized / unauthorized storage media.
- Any other abuse as found / amended from time to time.

- Unfortunately computer abuse, malicious behaviour and unauthorized account access do happen. If they are found, it should be reported immediately.

ii. ACTION

- Denial of service of SVPISTM's computing and communications resources for violation of policy are set by the various disciplinary entities, then communicated to and carried out by IT. In instances of immediate threat to the computing and communication systems, IT takes direct and immediate action to safeguard the resources it is charged to protect.
- When IT department is notified that a user appears to be abusing computing resources, all of his or her computing privileges may be suspended immediately when such an action is warranted to protect the computing resources and to assure reliable service to the rest of the community.

5. HOSTEL REGULATIONS

a. Behaviour and Discipline

- ✓ A hostel campus should be a place where students can have the best possible conditions for studying and adequate rest. As such due consideration must be accorded to other residents. Noise level must be kept low to allow others the opportunity to study or sleep in comfort. Television, Radio etc. provided in the common room must be switched off after 10:00 pm. These rules are intended to ensure a conducive environment for all residents.
- ✓ Residents shall not create or permit their guests or visitors to create any disturbance or other nuisance in the hostel that will interfere with the well-being of others.
- ✓ Possession and/or use of any prohibited items and substances like tobacco, alcohol, narcotics, etc., is banned inside the campus premises
- ✓ Smoking, chewing and spitting of pan in the hostel premises is strictly prohibited.
- ✓ Ragging in any form is prohibited. Punishments for ragging ranges from expulsion from hostel, debarring from exams to cancellation of admission. Ragging shall be treated as a serious offence and shall be dealt with as per the UGC Regulations.
- ✓ Social gathering in the hostel complex are not permitted without the prior and written consent of the warden.
- ✓ Hostel residents are not allowed to entertain unauthorized person(s). Anyone found in violation to this will be fined and penalized according to Institute rule.
- ✓ Resident students found in act of violence or misconduct outside the hostel premises is not the liability of the Warden or Institute administration. In such cases the resident student is responsible for himself/herself.

b. Upkeep of the Hostel

- ✓ Residents are responsible for keeping the hostel premises clean. Residents are advised to keep their room, the mess hall, common room, visitor's room, stair case and toilets and bathrooms clean at all time.
- ✓ All water taps, fans and electrical appliances must be turned / switched off when not in use.
- ✓ Noise level must be kept low to allow others the opportunity to study or sleep in comfort. Television, provided in the common room must be switched off or volume toned down after 10:00 pm. These rules are intended to ensure a conducive environment for all residents.
- ✓ The use of electrical appliances such as immersion heaters, electric stove/heater are forbidden in any of the room allotted for residence. Cooking, making tea etc is strictly prohibited in the room.
- ✓ Students shall conduct a room check to verify the inventory provided and endorse on the Check In/Check out Form. Any missing or damaged items must be reported to the hostel authority immediately. Otherwise, it will be assumed that all furnishings and fittings are in good order. The student will be responsible for any loss or damage thereafter.
- ✓ Resident(s) should not move any hostel property (table, chair, fan, cupboard, etc.) from one room to another. Any damage to hostel property must be reported immediately to the hostel authority/warden. Resident(s) will be charged for any damages except damages caused by normal wear and tear or faulty products/repairs.
- ✓ Residents will be personally responsible for the safety of their belongings. Residents are advised to keep their personal belongings and any other valuable items locked in their personal locker even when they are out for a short period. Any loss or theft of item(s) should be immediately reported to the hostel authority.
- ✓ Pasting of posters, writings, slogans and any kind of defacing the hostel in any form is not allowed.
- ✓ Electrician, contractors or any other service person may enter rooms as and when necessary in the course of their duty under the directive and permission from the warden only.
- ✓ The Hostel authority reserves the right to enter and inspect a hostel in the interests of health, safety and proper conduct of the students.
- ✓ Entry may also be made without prior notice, during normal hours, for the purpose of conducting non-emergency inspections. For repairs and maintenance purposes of showing the premises, students will be notified in advance by the hostel authority.

c. Entry and Timings

- ✓ It is required that residents of the hostel produce their Institute Identity card at the entrance of the hostel whenever he/she enters the hostel premises.
- ✓ Entry into the hostel is allowed till 7.00pm. Any late entries/night exits should be informed to the Warden in advance and permission to be obtained.
- ✓ Resident who wish to stay out of hostel should duly inform the authority about the same.

- ✓ If any student is absent/does not return to the hostel after 24 hours without any information of his/her whereabouts, roommate(s) or fellow residents should inform the hostel authority immediately.

d. Visitors and Guests

- ✓ All visitors to the hostel including the parents/guardian will have to make necessary entries in the visitor's book available at the hostel entrance.
- ✓ Visitors are restricted to the visitors lobby only.
- ✓ No visitors will be allowed inside the hostel premises after 7.00 pm.
- ✓ The visit of male guest(s) into female residence and vice versa is prohibited.

e. Allotment & Vacating of Hostel Accommodation

A limited hostel accommodation is available. It will be allotted on the basis of **"First come First Serve"** on full payment of one semester mess bill and hostel fees.

The criteria for allotment of hostel accommodation by the Institute are as under:

i. **First Priority:** Students admitted to a full-time Programme of study and are from outside the state of Tamil Nadu.

ii. **Second Priority:** Students admitted to a full-time Programme of study and are from outside the Coimbatore district.

iii. **Third Priority**: Students from within the district of Coimbatore but living outside the Town agglomeration of Coimbatore.

iv. **Fourth Priority**: All others.

- ✓ Accommodation in the hostel is allowed initially for the current semester and is subsequently renewed subject to the continuing registration and fulfillment of academic requirements by the resident from time to time. All residents should subject themselves to the proof of registration and payment of all hostel dues of the previous semester to be eligible to continue as resident of the hostel.
- ✓ The Director may allot accommodation to students, in exceptional situations, on case to case basis.
- ✓ The maximum duration of stay in the hostel is the normal prescribed period of the programmes of studies. Once the resident completed his/her Programme of studies, he/she is no longer a resident and is required to vacate the hostel.
- ✓ Terminal student must surrender his/her rooms to the concerned warden latest by last day in the case of even semester and last day in the case of odd semester.
- ✓ Resident who discontinues his/her studies from the Institute in the middle of a semester should clear all his/her mess dues and submit an application for vacating the hostel to the Senior Warden. Resident must hand over to the caretaker the complete charge of his /her room with all furniture and fixtures in tact at the time of vacating the room.

f. Constitution of the Hostel Committee:

The Hostel Committee shall have the following members:

- ✓ Warden who shall be ex-officio convener
- ✓ A senior member nominated by the Warden in consultation with the Director
- ✓ Two members of institute

g. Roles and Responsibilities of the Hostel Committee:

In principle, the Hostel Committee shall discuss and make recommendations regarding:

- ✓ Allotment
- ✓ Discipline of resident students
- ✓ Maintenance and development of the Hostel
- ✓ Matters related to Mess
- ✓ Any other matter pertaining to the Hostel

Hostel facility is available only for girl students.

6. ATTENDANCE, DISCIPLINARY & GRIEVANCE COMMITTEE

a. This committee is constituted for the smooth functioning of the various activities of the Institute and it consists of the following members :

Head of the Department / Academic I/c. - Chairman of the Committee Controller of Examinations - Convenor

Class Advisors - Members

b. The Committee will deliberate the following matters.

i. The matters relating to condonation and attendance shortages of students.

ii. All grievances and disciplinary problems of the students relating to malpractices in test, semester examinations, etc.

c. The meeting of the committee will be convened by the Controller of Examination. The Committee will send periodical report and the recommendations to the Director for consideration / ratification / approval.

7. MENTORSHIP

To help the students in planning their courses of study and for getting general inputs regarding either the academic programme or any other activity, counselling every student will be assigned to a faculty member who will be the mentor. Student would be allotted for each faculty mentors by the Head – Textiles / Management.

8. MALPRACTICE IN EXAMINATIONS

a. If a student is found copying in a test conducted for Continuous internal assessment, he / she will be given zero marks for that test and severely warned.

- ✓ If a student is found copying in the end semester examination he/she will be debarred from writing that particular paper in that semester. Based on the nature of malpractice, he/she may be debarred for two more attempts of writing that paper/all

papers. The disciplinary committee will make recommendations for necessary disciplinary action.

- ✓ During the examinations the candidates shall be under the disciplinary control of the Chief Superintendent of the centre who shall issue the necessary instructions. If a candidate disobeys instructions or misbehaves with any member of the supervisory staff or with any of the invigilators at the Centre, he/she may be expelled from the examination hall for that session.
- ✓ The invigilator shall immediately report the facts of such a case with full details of evidence to the Controller of Examinations who will refer the matter to the Discipline Committee. The Committee will make recommendations for disciplinary action.

b. Every day, before the examination begins, the invigilators shall call upon all the candidates to search their personal things, tables, desks, etc., and ask them to hand over all papers, books, notes or other reference material which they are not allowed to have in their possession or accessible to them in the examination hall. When a late-comer is admitted this warning shall be repeated to him at the time of entrance to the examination hall. They are also to ensure that each candidate has his/her identification card and hall ticket with him/her.

c. Use of Unfair means:

A candidate shall not use unfair means in connection with the examination. The following shall be deemed to be unfair means:

- ✓ Found in possession of incriminating material related/unrelated to the subject of the examination concerned.
- ✓ Found copying either from the possessed material or from a neighbor or from any devices.
- ✓ Inter-changing of answer scripts.
- ✓ Change of seat for copying.
- ✓ Trying to help other candidates.
- ✓ Found consulting neighbor.
- ✓ Exchange of answer sheets or relevant materials.
- ✓ Writing register number of some other candidate in the main answer paper.
- ✓ Insertion of pre-written answer sheets (Main sheets or Additional Sheets).
- ✓ Threatening the invigilator or insubordinate behavior as reported by the Chief Superintendent and/or Hall Superintendent.
- ✓ Consulting the invigilator for answering the questions in the examination.
- ✓ Cases of impersonation.
- ✓ Mass copying.

Note:

- ✓ The Director may declare any other act of omission or commission to be unfair means in respect of any or all the examination.
- ✓ Where the invigilator in charge is satisfied that one third (1/3) or more students were involved in using unfair-means or copying in a particular Examination Hall, it shall be deemed to be a case of mass copying.

d.

- ✓ The Hall Superintendent of the examination centre shall report to the Controller of Examinations, without delay and on the day of the occurrence if possible, each case where use of unfair means in the examination is suspected or discovered with full details of the evidence in support thereof and the statement of the candidate concerned, if any, on the forms supplied by the Controller of Examinations for the purpose.
- ✓ A candidate shall not be forced to give a statement by the invigilator. The act of his/her having refused to make a statement shall be recorded by the invigilator and shall be attested by two other members of the supervisory staff on duty at the time of occurrence of the incident.
- ✓ A candidate detected or suspected of using unfair means in the examination may be permitted to answer the question paper, but on separate answer-book. The answer-book in which the use of unfair means is suspected shall be seized by the invigilator, who shall send both the answer-books to the Controller of Examinations with his report. This will not affect the concerned candidate appearing in the rest of the examinations.
- ✓ All cases of use of unfair means shall be reported immediately to the Controller of Examinations by the examiner, paper-setter, evaluator, moderator, tabulator or the person connected with the semester examination as the case may be, with all relevant material.

9. INSTITUTE – INDUSTRY INTERACTION

SVPISTM provides practical industrial training. The students are taken to leading textile manufacturing units, textile research institutions, management institutes and export houses enabling them to get acquainted with the real time processes and the latest developments in the industry. Executives from Industry will deliver lectures and share their experiences on a regular basis with the students.

10. PLACEMENT ASSISTANCE CELL

A separate placement assistance cell is in place which is in constant touch with the leading textile manufacturing units, export units, overseas buying houses etc., and arrange campus recruitment. The placement cell at SVPISTM consists of a faculty coordinator and student coordinators from the programmes B.Sc, BBA and MBA. The placement cell will facilitate in creating opportunities and directions for the registered students towards placements.

a. Rules and Regulations of Placement Cell

1. All the final year students are required to read the placement rules and regulations, interested students should sign the registration form within two weeks from the commencement of classes for final year.
2. All the students are expected to know about various activities which would be

planned from time to time depending on need from the student coordinators

3. Each student has to be a part of their respective mail groups through which they will be informed all details of the placement program.
4. The students will be duly informed through the student's coordinators and notice board about the companies interested in placing students and it is the responsibility of the students to get appraised of the happening of the placement cell.
5. Companies deemed to be fit for conducting campus interview in our institute will make their pre-placement presentation. Any clarification regarding the company may be done before the interview itself.
6. Students should make the decision of attending the interview based on the pre-placement presentations. Also they should come in full formal dress code to attend the same.
7. Till the official information about the selection of the candidates is received from the company, students are allowed to participate in other companies to a maximum of three chances.
8. Once the placement cell receives the official information about the selection, the selected student will not be allowed to attend any other company interview. This is to ensure the policy of "one man – one job" to all the students. However after all students are placed such students will be given option for their future appearance.
9. Following are considered as campus placement.
    a. Student getting placement through campus placement interview coordinated by placement cell.
    b. Student getting placed on the basis of their on-going final project in the respective company.
    c. Any other assistance from the institute.
10. Registration of the student in placement cell is considered to be cancelled due to following reasons.
    a. Student not interested and not involved in the placement activities.
    b. Student who is continuously absent / not attending interviews.
    c. Student who is found by any means that they got the job personally and intentionally trying for better prospects through the institute.
    d. Any misconduct or indiscipline by students inside the campus.
11. The above mentioned rules are subject to change and it is within the discretion of the placement cell.
12. By registering with the placement cell does not mean it is a guarantee for job.

11. CLASS COMMITTEE

a. Each programme will have a Class Committee comprising the following members.

    i. Chairman: Head – Management / Textiles
    ii. All the faculty members handling courses for that class as members.
    iii. Two students' representatives with a minimum of 75% attendance during the semester shall be nominated by the class as members.

b. The functions of the Class Committee will be as follows :
c. The Class Committee shall meet post all CIA written tests.
d. The first meeting will be held within two weeks from the date of commencement of classes for the semester.
e. The class committee shall meaningfully interact and express opinions and suggestions to improve the effectiveness of teaching – learning process and analyse the performance of the students in the class test.
f. The Class Committee Minutes and the action taken report will be submitted to the Director.

12. TEMPORARY BREAK OF STUDY FROM THE PROGRAMME

A student may be permitted by the Director to withdraw from the programme for a maximum duration of one year, for reasons of medical grounds, physical fitness or other valid reasons subject to the recommendations of the class advisor in consent with the Head – Textiles / Management. In such cases, the student will have to fulfil all conditions to redo the programme.

13. PERFORMANCE ANALYSIS COMMITTEE

The Performance Analysis Committee will consist of Director as Chairman, Controller of Examinations as convenor and the members will be Head – Textiles / Management, all members of faculty and the class advisors. The meeting of the Performance Analysis Committee is to be held within four weeks from the last day of the semester examinations to analyse the performance of the students in all subjects of study (continuous and end semester).

14. RESULTS DECLARATION COMMIITEE

Results Declaration Committee will have Director as Chairman, Head – Textiles / Management and Controller of Examinations as members. After analysing the performance of the students in each course the committee is empowered to declare the results. If necessary, moderation of results will be done by this Committee. The findings and decisions of the performance analysis and results declaration committee is to be passed on to the Controller of Examinations immediately.

II. REGULATIONS

Definitions and Nomenclature

- Institute – Sardar Vallabhbhai Patel International School of Textiles and Management, Coimbatore.
- University / Collaborating University – Central University of Tamil Nadu, Thiruvarur.
- Programme – Bachelor of Science in Technical Textiles.
- Course - Every paper / subject of study offered under the programme.
- Curriculum - The various components / courses / labs in each programme that provides appropriate outcomes (knowledge, skills and attitude/behavior) towards the completion and objectives of the programme is called curriculum.
- Credits - Course work is measured in units called credit hours or credits. The number of lecture hours allocated for a course per week is the number of credits for that course. In case of practical and labs two hours will account for one credit.

1. QUALIFICATION FOR ADMISSION

a. Students for admission to the B.Sc. Programme will be required to fulfil the minimum qualification as specified in the following table.

S.No.	Programme	Minimum Qualification
1.	B.Sc. – Technical Textiles	A Pass in Plus two examination or equivalent of any recognized board in India with science stream/vocational stream with textile subjects, having 50% of marks for General and 45% marks for OBC (NCL)/SC/ST/PWD candidates

b. The Institute will prescribe from time to time other eligibility conditions for admission regarding the marks required to be secured by the student in the qualifying examination, minimum admissible percentage marks therein, permitted number of attempts for obtaining the qualifying examination, passing requirements in the respective entrance tests conducted by this institute for admissions, Common University Entrance Exams (CUET) scores or other competitive entrance tests, physical fitness requirements, sponsorship etc.

c. The detailed information about the eligibility and entrance tests can be had from the websites: www.svpistm.ac.in, www.cutn.ac.in and www.cucetexam.in.

2. DURATION OF THE PROGRAMME

a. The duration of the programmes are as follows:

Programme	Duration	
B.Sc. Technical Textiles Full-time	6 Semesters	3 Years
B.Sc. Technical Textiles Hons. (Full-time)	8 Semesters	4 Years
B.Sc. Technical Textiles Hons. with Research (Full-time)	8 Semesters	4 Years

The programme is designed with reference to the New Education Policy of Governement of India.

b. 3-year UG Degree:
Students who wish to undergo a 3-year UG programme will be awarded UG Degree in the major discipline after successful completion of three years.

c. 4-year UG Degree (Honours):
A four-year UG Honours degree in the major discipline will be awarded to those who complete a four-year degree programme.

d. 4-year UG Degree (Honours with Research):
Students who secure 75% marks and above in the first six semesters and wish to undertake research at the undergraduate level can choose a research stream in the fourth year. They should do a research dissertation under the guidance of a faculty member of the College. The dissertation will be in the major discipline and will be awarded a UG Degree (Honours with Research).

e. Exit options
   i. 6 semesters/ 3years – towards award of B.Sc Technical Textiles
   ii. 8 semesters/ 4 years – towards award of B.Sc Technical Textiles (Hons / Hons. with Research)

f. The duration of each semester will normally be 90 working days. The normal working days of 90 in each semester is exempted for semester VI/ VIII in which the students would spend time in industry/field for their project work.

g. A Student who is unable to complete the programme within the prescribed duration (6 semesters) may be allowed further to a maximum of 2 academic years after the completion of programme duration to complete the programme after which the marks obtained through Continual Internal Assessment (CIA) will be void.

3. STRUCTURE OF THE PROGRAMME

a. Student has an option of exiting after successful completion of three years with B.Sc Technical Textile or opt for a four year programme with B.Sc Technical Textiles (Hons./ Hons. with Research).

b. This program comprises of 23 Major Core courses, 9 Minor Stream, 4 Skill Enhancing Courses, 4 Ability Enhancing Courses, 3 Multi-Disciplinary courses, 5

Value Added Courses comprising of 50 courses including internships and project work. The program will consist of total 155 credit up to 6th semester.

c. This program (B.Sc. (Hons.)) comprises of 30 Major Core courses, 11 Minor Stream, 4 Skill Enhancing Courses, 4 Ability Enhancing Courses, 3 Multi-Disciplinary courses, 5 Value Added Courses comprising of 60 courses including internships and project work. The program will consist of total 187 credit up to 8th semester.
d. This program (B.Sc. (Hons. with Research) comprises of 29 Major Core courses, 9 Minor Stream, 4 Skill Enhancing Courses, 4 Ability Enhancing Courses, 3 Multi-Disciplinary courses, 5 Value Added Courses comprising of 57 courses including internships and project work. The program will consist of total 187 credit up to 8th semester.
e. The student can choose the elective courses from the list specified for concerned semester. Elective courses can be chosen by the student groups who would specialize in that elective unanimously. If the students opting for an elective are not in a position to have a consensus in selection of elective courses, rank order preference method would be adopted for finalizing the courses under electives.
f. For the project work at sixth / eighth semester, student will be permitted by the Programme Co-ordinator to work on an independent project under the supervision of a faculty member from the Institute (Internal Guide) and if required, be under a corporate guide assigned by the organization (External Guide).
g. The duration of the project will be three days per week during the sixth / eighth semester. At the end of the semester the student has to submit the project report.
h. The first 6 semesters are designed to incorporate core competencies in the stream Technical Textiles and can have an exit option after completion of 6 semesters, which will qualify for the award of degree of B.Sc Technical Textiles, subjected to fulfilling the minimum credit requirement for award of the degree. On completion of 8 semesters / 4 years, the student would be awarded B.Sc Technical Textiles (Hons./ Hons. with Research).
i. The Student has to inform the HoD at the start of the third year, if willing to proceed with the fourth year.

4. TYPES OF COURSES

a. **Major Core Courses:** Major discipline is the discipline or subject of main focus and the degree will be awarded in that discipline. For students enrolled in Department of Textiles, courses related to Textile studies are marked as 'Major core Course'. All Major Core Courses will be for 4 credits.
b. **Minor Stream Courses:** These courses help a student to gain a broader understanding beyond the major discipline.The student can choose the elective courses from the list specified for concerned semester. Elective courses can be chosen by the student groups who would specialize in that elective unanimously. If the students opting for an elective are not in a position to have a consensus in selection of elective courses, rank order preference method would be adopted for finalizing the courses under electives.
c. **Other courses :**

a) **Skill enhancing Laboratories courses***:* All UG students are required to undergo skill enhancing practical courses to develop their skillset through hands on practical laboratory classes.

b) **Multidisciplinary Courses:** All UG students are required to undergo 3 introductory-level courses relating to any of the broad disciplines relating to Natural and Physical Sciences / Mathematics, Statistics. These courses are intended to broaden the intellectual experience and form part of liberal arts and science education.

c) **Ability Enhancement Courses (Language*)***: Students are required to achieve competency in a Modern Indian Language (MIL) and in the English language with special emphasis on language and communication skills.

d) **Value-Added Courses:**

i. As an initiative towards developing students as industry ready professionals and competent entrepreneurs, value added courses are introduced in final semester.

ii. The courses are prescribed during the sixth semester based on the inputs from the students, industry experts, and feedback from the employers, industry readiness requirements, contemporary practices and trending topics at the time when the course is to be offered.

iii. The courses will be delivered by industry experts / external agencies / practitioners / academic experts in the respective discipline in which the course is designed. They bring the knowhow contemporary industry practices to the college doorstep.

iv. Multiple value added courses would be designed based on the said parameters and would be presented to the students for their choice of selecting two courses. A particular course would be delivered only if 40% of the batch strength opts for that course.

v. Students shall choose minimum of two courses or more based on their interests and account the credit points.

vi. These value added courses are voluntary basis and credits obtained will be added to the course credit as mentioned under 3b/3c.

vii. These credits cannot be compensated to the course credit that is mentioned under 3b/3c.

e) **Self-interest courses**

i. Our predominant focus today is to curate the wealth of information that is freely available on the web into high quality learning-outcome to one's interest, learning style and pace of learning.

ii. Self-learning courses based on the students' unique interests through open source learning is introduced among the students to make them gain a competitive advantage in the market.

iii. This flexible learning provides the students a broad spectrum of study.

iv. Each student can undergo one open source course through MOOC, SWAYAM, NPTEL etc., in sixth semester based on their interest which is related to the programme of study.

v. These courses shall account to one credit on successful completion of the course

as prescribed by the organizer. The credits such obtained will be added to the course credit as mentioned under 3b/3c.

vi. These credits cannot be compensated to the course credit that is mentioned under 3 b/3c.

d. **Internship:**

With the consultation of a faculty guide and the coordinator, every student shall undertake suitable internships. Each internship shall be for a minimum of three weeks at an industry during the summer vacation. Report of the Summer Internship is to be submitted by the students within 15 days from the commencement of the third and fifth Semester respectively as per the format and guidelines specified by the coordinator for report preparation.

The first internship should preferably be undertaken in the textile industry to help students understand the fundamental concepts such as fiber types, yarn manufacturing, fabric production, dyeing, printing, and finishing processes. The second internship should preferably be in the technical textile industry to help students understand the importance and application of technical textile in real-world scenarios.

e. **Project:**

Every student shall undertake a project work in the sixth semester in consultation with the faculty guide and the project coordinator. The project work shall be carried out in institution / industry / research organization. This project is to be carried out for duration of 12 weeks.

f. Mini Project

Students pursuing B.Sc. (Hons.) shall undertake a Mini Project during the eighth semester under the guidance of an allotted faculty member. The project work shall be carried out in institution / industry / research organization. This mini project is to be carried out for duration of 8 weeks.

g. Dissertation

Students choosing a 4-Year Bachelor's degree (Hons. with Research) are required to take up Dissertation under the guidance of a faculty member. The students are expected to complete the Dissertation in the eighth semester. The research outcomes of their project work may be published in peer-reviewed journals or may be presented in conferences /seminars.

5. ASSESSMENT OF THEORY COURSES

ASSESSMENT	MARKS
Continuous Internal Assessment	40
End Semester Examinations	60

Continuous Internal Assessment - Allotted marks are 40 for each theory course and the marks are inclusive of a written test and an assignment. The assignment can be in the

form of article, seminar, presentation and etc. The choice of assignment is left with the faculty concerned.

- Two written exams (Continuous Internal Assessment Test I & II) with 90 minutes duration for 50 marks may be conducted and this will be converted to 20 marks for each course/subject.
- Students may be asked to submit at least two assignments in each course during each semester.
- Student should also present papers and participate in seminars conducted for each subject.
- Students may be asked pursue on and submit appropriate documents to one or more of the assessment methods.
- The presentations by students would be assessed based on RUBRICS.
    - CRITERIONS:
        - Contributions
        - Attitude
        - Preparedness & Focus
        - Quality of Work
        - Timely completion

POINTS	AWARD OF MARKS
≥ 90	10 Marks
≥ 80 but < 90	8 Marks
≥ 60 but < 80	6 Marks
≥ 40 but < 60	4Marks
= 40	2 Marks

- Controller of Examinations will issue the schedule and conduct the written test. Award of internal marks by assessment through various methods specified is the responsibility of the faculty handling the particular course.
- The internal marks obtained by the students will be duly informed before the semester examinations.

The marks may be allocated as follows:

Written tests (Each test carries 10 marks)	20 Marks
Assignments / Seminars / Case studies / Article review / Paper presentation / Publications / Field study / Concept viva / Test based on MCQs / Quizzes etc.	10 Marks
Students' Presentation/mini project/any activity as decided by the respective subject faculty	10 Marks
Total	**40 Marks**

Question Paper Pattern (CIA)

Total Marks: 50 Duration: 90 Minutes

PART A Answer Any Five (5x3=15 Marks)

1.
2.
3.
…..
7.

(Remember & Understand)

PART B Answer Any Two (2x10=20 Marks)

8.
9.
10.

(Apply, Analyze & Evaluate)

PART C Compulsory Question (Case study) (1x15=15Marks)

11.

(Evaluate & Create)

6. ASSESSMENT OF PRACTICAL COURSES

a. List of exercise for the subjects that contain practical shall be designed by the faculty member who handles the subject for the semester and executed under his/her supervision. Record shall be maintained by the individual student for the exercises carried out.

b. Maximum Marks for practical is 100 which consist of :

Continuous Internal Assessment (Internal Marks)	**End Semester** (External Marks)
60	40

c. End semester exam for practical subjects which has credit, shall be conducted by the internal faculty member in the presence of an External Examiner. The Question paper shall be set by Internal Examiner in consultation with External Examiners and exercises are conducted for the duration designed by them. The assessment is carried out subsequently along with a viva-voce and the results for the same are forwarded to COE.

d. Criteria for evaluation of experiment may be framed by the course handling faculty based on the laboratory course.

7. EVALUATION OF INTERNSHIP, PROJECT WORK AND DISSERTATION:

a. INTERNSHIP

i. For evaluation of internship, the student will make a presentation of the report on a date to be announced by the Controller of Examinations. The Presentation and Viva-voce will be evaluated by a team consisting of the faculty guide, the Internal Examiner and another faculty member nominated as the External Examiner.

ii. During the internship period students will make presentation once in a week to the concerned faculty guide, and the final presentation-cum-viva voce examination marks shall be allotted as follows :

Type of assessment	Continuous Internal Assessment (Internal)	End Semester
Weekly Review (3)	**45**	**-**
Observation	**15**	**-**
Report	**-**	**30**
Presentation & viva voce	**-**	**10**
Total (100)	**60**	**40**

The internship report of the students shall be evaluated for a maximum of 100 marks of which 60 marks would be allotted for internal assessment and 40 marks would be allotted for external examination. A minimum of 20 marks should be obtained in external examination and in total 50 marks (Internal + External) should be obtained to pass.

b.PROJECT WORK:

i. During the project period students will make presentations to the faculty guide / faculty co-ordinator. The final presentation-cum-viva voce examination marks shall be allotted as follows:

Type of assessment	Continuous Internal Assessment (Internal)	End Semester
Project Reviews (3)	**60**	**-**
Report	**-**	**80**
Presentation & viva voce	**20**	**40**
Total (200)	**80**	**120**

The project work of the students shall be evaluated for a maximum of 200 marks of which 80 marks would be allotted for internal assessment and 120 marks would be allotted for external examination. A minimum of 60 marks should be obtained in

external examination and in total 100 marks (Internal + External) should be obtained to get pass.

ii. For evaluation of the project, the student will make a presentation of the Project work on a date to be announced by the Controller of Examinations. The Presentation and Viva-voce will be evaluated by a team consisting of an Internal Examiner and an External Examiner assigned by the Controller of Examination.

c. MINI PROJECT

During the mini project period students will make presentation once in a week to the concerned faculty guide, and the final presentation-cum viva-voce examination marks shall be allotted as follows:

Type of assessment	Continuous Internal Assessment (Internal)	End Semester
Weekly Review (3)	**45**	**-**
Observation	**15**	**-**
Report	**-**	**30**
Presentation & viva voce	**-**	**10**
Total (100)	**60**	**40**

The mini project report of the students shall be evaluated for a maximum of 100 marks of which 60 marks would be allotted for internal assessment and 40 marks would be allocated for external examination. A minimum of 20 marks should be obtained in external examination and in total 50 marks (Internal + External) should be obtained to pass.

d. DISSERTATION:

i. The dissertation for B.Sc Technical Textiles (4th year) is to be undertaken during semester VIII. It involves problem identification, literature survey, feasibility study, requirements gathering, work plan, detailed design, implementation, testing, optimization, documentation, demonstration etc.

ii. During the dissertation students will make presentations to the faculty guide / faculty co-ordinator. The final presentation-cum-viva voce examination marks shall be allotted as follows:

Type of assessment	Continuous Internal Assessment (Internal)	End Semester
Project Reviews (3)	**60**	**-**
Report	**-**	**80**
Presentation & viva voce	**20**	**40**
Total (200)	**80**	**120**

iii. The dissertation work of the students shall be evaluated for a maximum of 200 marks of which 80 marks would be allotted for internal assessment and 120 marks

would be allotted for external examination. A minimum of 60 marks should be obtained in external examination and in total 100 marks (Internal + External) should be obtained to get pass.

iv. For evaluation of the dissertation, the student will make a presentation of the dissertation work on a date to be announced by the Controller of Examinations. The Presentation and Viva-voce will be evaluated by a team consisting of an Internal Examiner and an External Examiner assigned by the Controller of Examination.

8. ELIGIBILITY CRITERIA FOR APPEARING IN EXAMINATIONS AND ATTENDANCE REQUIREMENT

a. Students fulfilling the following criteria will be allowed to appear in the examinations:
   (i) Paid all the fees and dues to the Institute
   (ii) He/She has minimum prescribed attendance in a semester in all courses.

b. The minimum required attendance is 75% of the hours conducted for the roll out of each individual course (inclusive of lecture hours, tutorial hours and practical lab hours) and other prescribed learning activities in each course.

c. The institute may for valid and convincing reasons condone the shortage in attendance not exceeding to 5%, provided that Head - Management makes a recommendation to this effect after consulting the Director of the institute. The institute will condone this 5% shortage in minimum requirement of attendance only on payment of condonation fee of Rupees 500 by the students.

d. The students deputed by the Institute to take part in the extra and co-curricular events shall be given a concession of up to 5% attendance, if necessary, in addition to the relaxations in the attendance requirement as provided above. Such concession would be available for the days of actual participation in the event, including journey time with the prior approval of the Director of the Institute. Such concession of up to 5 % in addition to the relaxation of attendance specified in "item c" may also be permitted for valid medical and physical illness.

e. The above said relaxations stated in item d will be considered for students whose academic progress and conduct is observed satisfactory.

f. The students who could not manage 75% attendance for two consecutive semesters have to repeat the semesters in the subsequent academic year. In such cases, the student will have to fulfil all the conditions to redo the programme

9. END SEMESTER EXAMINATIONS

a. End semester examinations will be scheduled by the COE / Director for all Practical and Theory courses. The filled in Application forms with the payment of Examination fee for the students is Rs. 300/- per course (including Practical) to be submitted to the COE section within the stipulated time. The question paper will be set by an external examiner.

b. The End Semester Examination will be conducted for 100 Marks with a duration of 3 hours. A student should secure a minimum of 50 marks in the examination to get a

pass in each course. Marks obtained by the students in the examination will be converted to 60%.

c. A minimum of 50% (End Semester and Continuous Assessment) in each course is required for obtaining a pass and the grades.

Question Paper Pattern (ESE)

Total Marks: 100 **Duration: 180 Minutes**

PART A Answer all questions **(10x3= 30 Marks)**

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

(Remember & Understand)

PART B Answer all questions **(5x10=50 Marks)**

11. A or
    B
12. A or
    B

13. A or
    B
14. A or
    B
15. A or
    B

(Apply, Analyze & Evaluate)

PART C Compulsory question **(1x20=20 Marks)**

16.

(Evaluate & Create)

10. MOVEMENT TO HIGHER SEMESTER

a. Every student should register for the next semester along with the statement of results of the previous semester, proof of payment of tuition fees and mess fees (if applicable).

b. The following students would not be allowed to proceed to the next semester and would have to complete the semester which they had not completed only at the next available opportunity.

   i. Students who had failed to gain the minimum attendance in one or more courses conducted in the preceding semester
   ii. Students who had not completed the academic requirements for the course(s) in the preceding semester
   iii. Students who had been barred from taking the continuous internal assessment and or end semester examination for a course(s) other than valid reasons or medical grounds as approved by Director of the institute
   iv. Students who have got pending payments due to the institute
   v. Students who are barred in the preceding semester on grounds and practices of indiscipline

c. A student who is permitted to discontinue may re-join the programme at the appropriate semester only along with the students enrolled at the time of regular commencement of that semester as per the academic schedule of the institute.

d. A student who discontinues and re-joins shall be governed by the rules, regulations, courses of study and syllabus followed, at the time of his / her re-joining the programme.

e. Any student appearing for supplementary examinations in any subject, two years after the first registration for that subject, will be governed by the regulations and syllabus followed at the time when the supplementary examination is taken.

11. PERFORMANCE EVALUATION SYSTEM

a. **Assessment of a subject** will be done on mark basis. The Performance Analysis Committee shall meet within three weeks after the completion of all examinations to analyse the performance of students in all assessments (continuous and end semester) for each course.

b. **The letter grades and the corresponding grade points** are as follows:
Grading system for the programme is as follows:

Marks Range	Corresponding Grade	Grade Point
Below 50	**RA (Re- Appearance)**	**N.A**
50 and above but below 60	B (Above Average)	6
60 and above but below 70	B+ (Good)	7
70 and above but below 80	A (Very Good)	8
80 and above but below 90	A+ (Excellent)	9

90 and above 100	O (Outstanding)	10

c. Classification

A student in order to be eligible for the award of the Degree must obtain a minimum of "B" grade in each course. The results of successful candidates will be classified as indicated below on the basis of the Cumulative Grade Point Average (CGPA):

S. No.	Range of CGPA	Classification (Provided the student pass all courses in the first attempt)
1	CGPA of 8.0 and above and up to 10.0	First Class with Distinction
2	CGPA of 6.5and above and up to 7.9	First Class
3	CGPA of 5.5and above and up to 6.4	Second Class

12. GRADE SHEET

a. After the results are declared, Grade Sheets will be issued to each student which will contain the list of subjects for that semester and the grades obtained by the student.

b. Grade Point Average (GPA) for each semester will be calculated only for those students who have passed all the subjects of that semester. Similarly, Cumulative Grade Point Average (CGPA) up to any semester will be calculated only for those students who have passed all the subjects up to that semester. GPA is calculated as follows:

$$GPA = \frac{\Sigma (Ci*GPi)}{\Sigma (Ci)}$$

Where Ci - is the credit assigned to the course
GPi - is the grade point obtained by the student

c. On successful completion of the programme, the CGPA is calculated as follows:

$$CGPA = \frac{\Sigma (C_i*GP_i)}{N}$$

Where Ci - is the credit assigned to the course
GPi - is the grade point obtained by the student
N - is the total number of credits for the entire programme

13. ELIGIBILITY TO AWARD B.Sc. Technical Textiles/ B.Sc. Technical Textiles (Hons. With Research)

A student shall be eligible for the award of B.Sc, Technical Textiles/ BSc. Technical Textiles (Hons. With Research) if the student has,

a. Undergone the prescribed programme of study and has passed in all the courses specified for the programme including the value added courses and self-interest courses.
b. No dues to the Institute, Library, Hostel etc.
c. No disciplinary action pending against him / her.

14. CONSOLIDATED STATEMENT OF GRADES

a. At the end of the programme, all successful students will be furnished with a consolidated statement of grades which will contain the following particulars :
   i. Grades in the courses of the semesters
   ii. CGPA
   iii. Classification (First class with Distinction / First class / Second class.
b. A student who has completed the minimum period and has undergone all the courses specified in a programme may be given a course completion certificate.
c. At the end of the programme all successful students can apply for the provisional certificate on payment of prescribed fees of Rs.500/- through proper application to the CoE.

15. REVALUATION OF ANSWER SCRIPTS

Within one week from the announcement of examination result, a student may ask for photocopies of his / her semester / supplementary examination answer paper in any subject on payment of Rs. 400/- per course through proper application to the Controller of Examinations. Subsequently, within a week's time he / she can opt for revaluation if he / she so desires, on payment of Rs. 500/- per course through proper application to the Controller of Examinations.

16. SUPPLEMENTARY EXAMINATIONS

Supplementary examination for failed students will be scheduled along with the semester examinations. Students registering for supplementary examinations at the end of any semester should register for the courses he / she intends to appear by submitting application in the prescribed form with the prescribed fee of Rs.300/- per subject for B.Sc Programme to the Controller of Examinations. The candidates can appear for the supplementary examinations for the maximum period of 2 years from their period of study.

17. WITHDRAWAL FROM EXAMINATION

A student may for valid reasons and on the recommendation of the Programme Co-ordinator, be granted permission to withdraw from appearing for the entire Semester Examination as one unit. Withdrawal application shall be valid, only if it is made 10 days before the commencement of the semester examination pertaining to the semester. Such withdrawal shall be permitted only once during the entire programme and shall not be construed as an appearance for the eligibility of a student for the award of classification specified. If a student falls sick in the middle of the Semester Examinations, he / she can withdraw from one or more courses.

BACHELOR OF SCIENCE - TECHNICAL TEXTILES
III. CURRICULUM & SYLLABUS

1. MISSION OBJECTIVES (MOs):

MO1	Have attitude and knowledge for the successful professional and technical career
MO2	Have strong foundation in basic sciences, management, mathematics and computational platforms
MO3	Have knowledge on the theory and practices in the field of apparel manufacturing technology and allied areas
MO4	Engross in life-long learning to keep themselves abreast of new developments, and practice and inspire high ethical values and technical standards

2. PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

On successful completion of the program, the student will be able to:

PEO1	Graduates will be able to apply acquired knowledge to identify challenges and provide appropriate solutions in the relevant discipline of textiles and allied industries.
PEO2	Graduates will develop the ability to define, conceptualize, and implement innovative ideas to meet industry demands and societal needs.
PEO3	Graduates will possess the necessary expertise and business acumen to establish and manage entrepreneurial ventures in the textile sector.
PEO4	Graduates will be equipped with research skills to analyze, improve, and optimize textile products and processes for enhanced efficiency and sustainability.
PEO5	Graduates will demonstrate professional ethics, leadership qualities, and teamwork abilities to excel in diverse professional environments.

3. PROGRAMME OUTCOMES (PO)

On the successful completion of the program, the student will be able to:

PO1	Graduates will apply their knowledge to design and develop innovative functional and protective textile products that address societal and industrial needs.
PO2	Graduates will be capable of designing and implementing advanced manufacturing techniques to produce high-quality, cost-effective products with a focus on sustainability.
PO3	Graduates will conduct research, optimize textile products and processes, and ensure compliance with quality standards and industry regulations.
PO4	Graduates will develop entrepreneurial competence, leadership abilities, and managerial skills to establish and manage ventures in the textile and allied sectors.the profession.
PO5	Graduates will uphold ethical values, demonstrate professionalism, and engage in lifelong learning to adapt to evolving industry trends and challenges.

4. Mapping of MOs and PEOs

S- Strong, M - Medium

Mission Statements (M)	PEO1	PEO2	PEO3	PEO4	PEO5
MO1	S	M	M	M	S
MO2	S	M	M	S	M
MO3	S	S	M	S	M
MO4	M	M	S	M	S

5. Mapping of PEOs and POs

S- Strong, M - Medium

	PO1	PO2	PO3	PO4	PO5
PEO1	S	S	M	S	M
PEO2	S	S	S	M	M
PEO3	M	M	M	S	S
PEO4	S	S	S	M	M
PEO5	M	M	M	S	S

6. GRADUATE ATTRIBUTES OF B.SC. TECHNICAL TEXTILE PROGRAMME

1. **Technical skills:** Understanding technical textiles and relevant technologies.
2. **Creative skills:** Ability to design, illustrate, and innovate.
3. **Critical thinking:** Problem-solving and trend analysis.
4. **Communication skills:** Effective presentation and collaboration.
5. **Business knowledge:** Understanding the technical textile industry and entrepreneurship.
6. **Ethical awareness:** Commitment to sustainability and ethical practices.
7. **Adaptability:** Lifelong learning and ability to adjust to industry changes.

List of abbreviations

- L – Lecture Hours / Contact Sessions
- T – Tutorial Hours
- P – Practical Hours
- C-Credit
- CT – Course Type
- AM – Assessment Methodology
- CIA – Continuous Internal Assessment

- ESE – End Semester Examination
- MC – Major (Core)
- MS – Minor Stream
- MD – Multi Disciplinary
- SEC – Skill Enhancement Course
- AEC – Ability Enhancement Course
- VC – Value Added Courses
- I – Internship
- PW – Project Work

7. SUBJECT CURRICULAM

SEMESTER I								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSUG11T/ 25BSUG11H	Tamil - I / Hindi - I	3	0	0	3	AEC	40	60
25BSUG12	Communicative English	3	0	0	3	AEC	40	60
25BSTT11	Applied Physics and Chemistry	3	1	0	4	MD	40	60
25BSTT12	Applied Statistics	4	0	0	4	SEC	40	60
25BSTT13	Technology of Pre-Spinning Process	4	0	0	4	MC	40	60
25BSTT14	Characteristics of Technical Fibres	4	0	0	4	MC	40	60
25BSTT15L	Applied Physics and Chemistry Laboratory	0	0	4	2	MD	60	40
25BSTT16L	Pre-Spinning Laboratory	0	0	4	2	MC	60	40
Total lecture/tutorial/practical hours		**21**	**1**	**8**				
Total credits		**26**						
SEMESTER II								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSUG21T/ 25BSUG21H	Tamil - II / Hindi – II	3	0	0	3	AEC	40	60
25BSUG22	Technical English	3	0	0	3	AEC	40	60
25BSTT21	Mathematical Data Analysis	3	0	2	4	MD	40	60
25BSTT22	Yarn Spinning for Technical Textile	4	0	0	4	MC	40	60
25BSTT23	Technology of Pre-Weaving Process	4	0	0	4	MC	40	60
25BSTT24	Technology of Manufactured Fibre Production	4	0	0	4	MC	40	60
25BSTT25L	Pre-Weaving Laboratory	0	0	4	2	MC	60	40
25BSTT26L	Yarn Spinning Laboratory	0	0	4	2	MC	60	40
25BSTT27	Yoga for Human Excellence#	0	0	2	1	VAC	100	-
Total lecture/tutorial/practical hours		**21**	**0**	**12**				
Total credits		**27**						

SEMESTER III								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSTT31	Technical Fabric Manufacturing	4	0	0	4	MC	40	60
25BSTT32	Modern Knitting Technology	4	0	0	4	MC	40	60
25BSTT33	Technology of nonwovens and bonded fabrics	4	0	0	4	MC	40	60
25BSTT34	Technical Textiles I	3	0	0	3	MC	40	60
25BSTT35	Elective - I	3	0	0	3	MS	40	60
25BSTT36L	Non-woven and Bonded fabrics laboratory	0	0	4	2	MC	60	40
25BSTT37L	Modern Knitting Laboratory	0	0	4	2	MC	60	40
25BSTT38L	Fabric Manufacturing Laboratory	0	0	4	2	MC	60	40
25BSUG39I	Internship - I	0	0	0	3	SI	60	40
Total lecture/tutorial/practical hours		**18**	**0**	**12**				
Total credits		**27**						

SEMESTER IV								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSTT41	Textile Chemical Processing	3	1	0	4	MS	40	60
25BSTT42	Technical Fabric Structure	3	1	0	4	MS	40	60
25BSTT43	Technical Textiles II	3	0	0	3	MC	40	60
25BSTT44	Garment Manufacturing Technology	3	0	0	3	MS	40	60
25BSTT45	Elective - II	3	0	0	3	MS	40	60
25BSTT46	Environmental Studies	2	0	0	2	VAC	40	60
25BSTT47L	Fabric structure Analysis Laboratory	0	0	4	2	SEC	60	40
25BSTT48L	Textile Chemical Processing Laboratory	0	0	4	2	SEC	60	40
25BSTT49L	Garment manufacturing laboratory	0	0	4	2	SEC	60	40
Total lecture/tutorial/practical hours		**17**	**2**	**12**				
Total credits		**25**						

SEMESTER V								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSTT51	High Performance fibers	3	0	0	3	MC	40	60
25BSTT52	Functional finishing of Textile Material	4	0	0	4	MC	40	60
25BSTT53	Technical Textiles III	4	0	0	4	MC	40	60
25BSTT54	Elective - III	3	0	0	3	MS	40	60
25BSTT55	Elective - IV	3	0	0	3	MS	40	60
25BSTT56	Quality Evaluation for Technical Textile	3	0	0	3	MC	40	60
25BSTT57L	Textile Quality Evaluation Laboratory	0	0	4	2	MC	60	40
25BSTT58L	Technical Textile product Laboratory	0	0	4	2	MC	60	40
25BSUG59I	Internship - II	0	0	0	3	SI	60	40
Total lecture/tutorial/practical hours		**20**	**0**	**8**				
Total credits		**27**						

SEMESTER VI								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSTT61	Costing and Ex-Im management	3	0	0	3	MC	40	60
25BSTT62	Entrepreneurship Development	3	0	0	3	MS	40	60
25BSTT63	Value Added Course - I #	2	0	0	2	VAC	100	-
25BSTT64	Value Added Course - II #	2	0	0	2	VAC	100	-
25BSTT65S	Self-interest Course #	0	0	0	1	VAC	100	-
25BSUG66P	Project Work	0	0	24	12	PW	80	120
Total lecture/tutorial/practical hours		**12**	**0**	**24**				
Total credits		**23**						
Total Cumulative credits including value added and self-interest courses		**155**						

SEMESTER VII								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSTT71	Research Methodology	4	0	0	4	MC	40	60
25BSTT72	Industrial Management	3	0	0	3	MS	40	60
25BSTT73	New Product Development & Assessment	3	0	0	3	MC	40	60
25BSTT74	Medical Textiles	4	0	0	4	MC	40	60
25BSTT75	Textile Reinforced Composites	3	0	0	3	MC	40	60
25BSTT76	Protective Textiles	3	0	0	3	MC	80	20
Total lecture/tutorial/practical hours		**20**	**0**	**0**				
Total credits		**20**						

SEMESTER VIII (for students pursuing B.Sc (Hons.)								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSTT81	Total Quality Management	3	0	0	3	MS	40	60
25BSTT82	Nano Textiles	3	0	0	3	MS	40	60
25BSTT83L	Creativity and Innovation Laboratory	0	0	4	2	MC	60	40
25BSUG84M	Mini Project	0	0	8	4	MC	80	120
Total lecture/tutorial/practical hours		**6**	**0**	**12**				
Total credits		**12**						
SEMESTER VIII (for students pursuing B.Sc (Hons. With Research)								
COURSE CODE	**COURSE NAME**	**L**	**T**	**P**	**C**	**CT**	**AM**	
							CIA	**ESE**
25BSUG81D	Dissertation	0	0	24	12	MC	80	120
Total		0	0	12	12			
Total lecture/tutorial/practical hours		**0**	**0**	**24**				
Total credits		**12**						
Total Cumulative credits including value added and self-interest courses		**187**						

- Those students opting for B.Sc (Hons. with Research) can pursue full time project with 12 credits

8. LIST OF ELECTIVE COURSES:

ELECTIVE COURSES (EC)	
25BSTT35 (A)	Clothing Comfort
25BSTT35 (B)	Coated and Laminated textiles
25BSTT45 (A)	Smart and wearable textiles
25BSTT45 (B)	Geotextiles
25BSTT54 (A)	Apparel marketing and merchandising
25BSTT54 (B)	Retail Management
25BSTT55 (A)	Sustainable Technical Textile
25BSTT55 (B)	Military Textiles

9. LIST OF VALUE ADDED COURSES:

- Marketing and Merchandising
- Intellectual Property Rights
- Digital Marketing
- Artificial Intelligence (AI)
- Industry 4.0
- Internet of Things (IoT)

The courses may be offered as per the requirement of the industry and choice of the students. The list may be updated as per the recent trends.

10. CREDIT FRAMEWORK/ SUMMARY

S. No	Course Type	Credits per Semester									Total Credits
		I	II	III	IV	V	VI	VII	VIII	VIII*	
1	MC	10	16	21	3	18	3	17	6	12	**94/100**
2	MS	-	-	3	14	6	3	3	6	-	**35/29**
3	AEC	6	6	-	-	-	-	-	-	-	**12**
4	SEC	4	-	-	6	-	-	-	-	-	**10**
5	VC	-	1	-	2	-	5	-	-	-	**8**
6	SI	-	-	3	-	3	-	-	-	-	**6**
7	MD	6	4	-	-	-	-	-	-	-	**10**
8	PW	-	-	-	-	-	12	-	-	-	**12**
Total Credits		**26**	**27**	**27**	**25**	**27**	**23**	**20**	**12**	**12**	**187**

*- for B.Sc (Hons. with research)

BACHELOR OF SCIENCE – TECHNICAL TEXTILES
11. SYLLABUS

SEMESTER I

25BSUG11T- Tamil - I

குறிக்கோள்கள்:

- பாரத நாட்டின் பெருமை, தற்போதைய சமூக நிகழ்வுகளையும் மனித உணர்வுகளையும் புது கவிஞர்கள் வாயிலாக மாணவர்களுக்கு உணர்த்துதல்
- வாழ்வில் பின்பற்றவேண்டிய தனி மனித சமூக ஒழுக்கங்களை சிறுகதை மற்றும் உரைநடை வாயிலாக மாணவர்களுக்கு உணர்த்துதல்

CO Number	Course Outcome	Level
CO1	Appreciate the greatness of India through modern Tamil poetry.	Understand
CO2	Interpret social events and human emotions reflected in contemporary Tamil poems.	Apply
CO3	Understand the moral values and ethical behaviors necessary for life through short stories and prose.	Understand
CO4	Relate the teachings of Tamil writers to current societal issues.	Understand
CO5	Reflect on individual and social ethics learned through Tamil literary forms.	Analyze

	MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**		**M**		
CO3	**S**	**S**	**S**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**		**M**

அலகு - 1 (செய்யுள்)

1.பாரதியார் – பாரத நாடு
2.பாரதிதாசன் - உலகம் உன்னுடையது
3.நாமக்கல் கவிஞர் இராமலிங்கம் பிள்ளை- சூரியன் வருவது யாராலே
4.அழ.வள்ளியப்பா - ஒரு வரம் கண்ணாடி
5.கண்ணதாசன் – யாத்திரை

அலகு - 2 (செய்யுள்)

1. மு. மேத்தா - மரங்கள்
2. வைரமுத்து - சுதந்திரம்
3. ஈரோடு தமிழன்பன்- அகல் விளக்காக இரு
4. அப்துல் ரகுமான்- கண்ணீரின் ரகசியம்....
5. மாலதி மைத்ரி- குருவி
6. வத்ஸலா - நான் ஆலமரம்

அலகு - 3 (இலக்கணம்)

1.வல்லெழுத்து மிகும் இடங்கள்
2.வல்லெழுத்து மிகா இடங்கள்

அலகு-4 (இலக்கிய வரலாறு)

1.மரபுக்கவிதையின் சிறப்பு இயல்புகள்
2.புதுக்கவிதையின் சிறப்பு இயல்புகள்
3.சிறுகதையின் தோற்றமும் வளர்ச்சியும்
4.உரைநடையின் தோற்றமும் வளர்ச்சியும்

அலகு-5

1. அறம் எனப்படுவது - முனைவர். அமுதன்
2. அழகோ அழகு - வெ. இறையன்பு

பாட புத்தகம்:

1. அறம் எனப்படுவது (முனைவர். அமுதன்) – நியூ செஞ்சுரி புக் ஹவுஸ் பி லிட், 41பி, சிட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர், சென்னை-600098
2. அழகோ அழகு - வெ. இறையன்பு - நியூ செஞ்சுரி புக் ஹவுஸ் பி லிட், 41பி, சிட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர், சென்னை-600098

குறிப்பு புத்தகம்:

1. தீந்தமிழ் இலக்கணம் (க. வெள்ளிமலை எம்.ஏ.) – ஐவரி அச்சகம், சென்னை – 600005
2. இலக்கணம் இலக்கிய வரலாறு மொழித்திறன் (பேராசிரியர்.முனைவர். பாக்யமேரி) – பூவேந்தன் பதிப்பகம், மயிலாப்பூர், சென்னை

25BSUG11H - HINDI – I

Course Objectives

- To enable the learners to know about the modern trends in Literature
- To imbibe values, social, moral through prose and short stories.
- To introduce the concept of Translation.
- To create an opportunity for the students to learn functional aspects of the language.

Course Outcome

Upon completion the student would be able to,

- Identify the importance a prose
- Translate Hindi to English
- To know about Hindi writers and get moral values from different stories.
- Comprehension will help the students for competitive exams.

CO Number	Course Outcome	Level
CO1	Identify the importance and relevance of Hindi prose in literature and communication.	Understand
CO2	Translate prose passages from Hindi to English effectively.	Apply
CO3	Gain knowledge about prominent Hindi writers and their contributions.	Understand
CO4	Derive moral values from various Hindi stories.	Understand
CO5	Improve comprehension skills that aid in preparation for competitive exams.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**				
CO3	**S**				**M**
CO4			**M**		**S**
CO5			**S**	**M**	**M**

UNIT I

Prose: 1. Meri vasiyath, 2. Kadhamba ke phool, 3. bathcheeth mem shistachar

UNIT II

Non-Detailed: 1. Pareeksha, 2. Takur ka kuwa, 3. Trishanku bechara

UNIT III

Bahuyuktha hindi padnam

UNIT IV

Translation: Hindi to English only (1 – 10 Lessons only).

UNIT V

Comprehension: 15 - 30 Lessons only.

TEXT BOOKS:

1. Govind. M. A., 'Gadhya Manjusha', Amar Prakashan, Mathura, (U.P).
2. Hiranmaya, 'Hindi Gadhya Prabhakar', Siksha Bharathy, New Delhi – 110006.
3. Shankar S K, 'Madhyamic Gadhya sankalan', Lokbharathi Prakashan, Allahabad – 1.
4. Amithab V P, 'Kahani Kunj', Govind Prakashan, Mathura, U. P. – 281 001.
5. Krishnan K, 'Premchand ki shreshtha Kahaniyan', Vani Prakashan, New Delhi – 110002.
6. Prakash S, 'Gadhya Prasang', Sumithra Prakashan, Allahabad - 1
7. Rahamadulla S, Vyavaharic Hindi, Page: 90-91.
8. D.B.H.P. Sabha , 'Anuvad Abhyas – Part III', Chennai - 17.

25BSUG12 - COMMUNICATIVE ENGLISH

Course Objectives:

- To convey message to others clearly
- To develop communication skills
- To enhance students' communicative competence and performance
- To instill language skills

Course Outcomes:

- Expanding the learner's use of maximum functions of English
- Acquiring effective communications both oral and written
- Applying language functions in real situations.

CO Number	Course Outcome	Level
CO1	Learners will demonstrate the ability to use a wide range of English language functions effectively in various contexts.	Understanding & Application
CO2	Learners will develop fluency and clarity in spoken English for professional and social interactions.	Application & Communication
CO3	Learners will produce well-structured written content, including reports, emails, and academic writing.	Application & Writing Skills
CO4	Learners will apply appropriate language structures and vocabulary in day-to-day communication and workplace situations.	Practical Application
CO5	Learners will analyze, interpret, and respond to various forms of spoken and written English effectively.	Analysis & Interpretation

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**M**	**S**			
CO3	**S**		**M**		
CO4	**M**	**S**	**M**		
CO5			**S**	**M**	**S**

UNIT I: Functions of English

Use of English in media, business and technology – Social functions: Conversational English Greeting, introducing, requesting, inviting, congratulating, thanking, apologizing, advice,

suggestions, opinions, permission, sympathy, asking to repeat, complaining, understanding and being understood, agreement, preference, asking for information, changing the topic.

UNIT II: Oral Communication

Face to face communication – Telephonic conversation: Skills and etiquette – Interview skills – Instruction – Dictation.

UNIT III: Remedial Grammar

Subject verb agreement – Tenses – Transformation of sentence – Auxiliary verbs – Linkers.

UNIT IV: Listening and Reading

Academic listening; Listening to talks and descriptions; Listening to Announcements; Listening to Media news; Listening to casual conversations – Intensive reading, extensive reading, skimming, scanning, literary reading, non-literary reading

UNIT V: **Written Communication**

Email – letter writing - report writing – note taking – sentence construction (patterns)

TEXT BOOKS:

1. Syamala V, 'Effective English Communication for you', Emerald Publishers, Chennai, 2005. ISBN: 81-7966-002-8.
2. Mohan, Krishna and Banerji M, 'Developing Communication Skills', Macmillan, New Delhi, 2007. ISBN: 978-0333-92919-3.
3. **Dutt, Kiranmai P, Rajeevan G and Prakash C L N, 'A Course in Communication Skills', Cambridge University Press, New Delhi, 2007. ISBN: 978-81-7596-536-2**

25BSTT11 - APPLIED PHYSICS AND CHEMISTRY

Course Objectives

- To understand the application of physics and chemistry in Textiles
- To relate various important terminologies and laws with textile application

Course Outcomes

Upon successful completion of the course the student would be able to,

- Discuss various terminologies related to elasticity, viscosity
- Identify the origin of dyes
- Explain the polymerization process

CO Number	Course Outcome	Level
CO1	Discuss various terminologies related to elasticity and viscosity.	Understanding
CO2	Identify the origin of dyes.	Knowledge & Recognition
CO3	Explain the polymerization process.	Conceptual Understanding
CO4	Analyze the impact of elasticity and viscosity in material behavior.	Analytical Thinking
CO5	Apply knowledge of dyes and polymerization in textile processing.	Application & Problem-Solving

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**M**	**S**			
CO3	**S**		**M**		
CO4	**M**	**S**	**M**		
CO5			**S**	**M**	**S**

UNIT I

Colour and Chemical Constitution: Colour and constitution - theory of colors. Classification of dyes based on structure, according to application and mode of dyeing. Chemistry of azo dyes, selective examples and its usage in clothing textile.

UNIT II

Chemical analysis of oils and fats: Acid value, saponification and iodine values, viscosity, viscosity index, flash and fire points.

Surfactants: Classification and chemistry of surfactants- application of surfactants in textiles.

UNIT III

Polymers: Introduction – Classification – Types and mechanism of polymerization – Degree of Polymerization. Synthesis of some selective polymers: Polyethylene (LDPE & HDPE), Polyacrylonitrile, Polyesters (PET), Polyamides – Nylon 6 and Nylon 6, 6.

UNIT IV

Elasticity: Modulus of elasticity – Poisson‟s ratio – Relation between elastic constants and Poisson‟s ratio –Torsional pendulum (with and without weights) – Bending of beams – Bending moment – Cantilever loading – Transverse vibrations of cantilever – Non uniform and uniform bending of a beam.

UNIT V

Surface Tension and Viscosity: Molecular interpretation – Surface energy – Molecular force – Shape of liquid meniscus in capillary tube – Angle of contact – Capillary rise and energy consideration. Newton‟s law – Poiseuilles flow – Stoke‟s fall – Rotation viscometer – Ostwald viscometer. Effect of temperature and pressure on viscosity.

TEXT BOOKS:

1. Mathur D S, “Elements of Properties of matter”, S Chand Limited, 2008.
2. Brijlal & Subhramanyam N, “Properties of matter”, S Chand & Co., New Delhi, 2003.
3. Soni P L & Chawla H M, “Text book of Organic Chemistry”, S Chand & Co., New Delhi, 2012.
4. B.K.Sharma, “Industrial chemistry”, Krishna Prakashan Media (P) Ltd, Meerut, 2011.

REFERENCES:

1. Gulati H R, “Fundamental of General properties of matter”, R Chand & Co., 1982.
2. White F M, “Fluid Mechanics”, Tata McGraw-Hill, 5th edition, New Delhi, 2017.
3. Tiwari K S, Vishnoi N K, Mehrotra S N, “A Text Book of Organic Chemistry”, Vikas Publishing House, 4th Ed., New Delhi, 2017.
4. Shore J, “Colourants and Auxiliaries: Volume II Auxiliaries”, Wood head Publishing Ltd.,2002.

25BSTT12 – APPLIED STATISTICS

Course Objectives

- To enable the students to acquire knowledge in the area of statistics and their applications in business decision making.
- To familiarize the student with functions of several variables.

Course Outcomes

Upon successful completion of this course the student would be able to,

- Diagrammatically represent the data
- Applicate the various statistical tools for explanation

CO Number	Course Outcome	Level
CO1	Diagrammatically represent the data.	Understand
CO2	Apply various statistical tools for explanation.	Apply
CO3	Analyze statistical data to derive meaningful conclusions.	Understand
CO4	Interpret graphical representations for better decision-making.	Understand
CO5	Utilize statistical methods to solve real-world problems.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**M**	**S**			
CO3	**S**		**M**		
CO4	**M**	**S**	**M**		
CO5			**S**	**M**	**S**

UNIT I

Presentation of data by diagrammatic and graphical method - Formation of frequency distribution. Probability – Concept, Bayes' theorem. Probability distributions - Binomial, Poisson and normal

UNIT II

Measures of central tendency - Arithmetic mean, median, mode, geometric and harmonic mean, measures of variation and standard mean and quartile deviations - Skewness and Kurtoses

UNIT III

Simple correlation - Scatter diagram - Karl Pearson's Co-efficient of correlation – Rank correlation – Regression – Simple and multiple regression analysis - Regression lines

UNIT IV

Sample design – Sampling theory and test of significance – Quality tools – DOE, ANOVA and Chi square test

UNIT V

Analysis of Time Series: Methods of measuring - Trend and seasonal variations – Index number – Unweighted indices - Consumers price and cost of living indices.

Note: Theory and problem shall be distributed at 20% and 80% respectively.

TEXT BOOKS:

1. Das N G, "Statistical Methods", McGraw Hill Education, 1st Edition, 2008.
2. Goon A M, Gupta M K & Das Gupta B, "Fundamentals of Statistics" Vol I & II, The World Press P Ltd., 1968.
3. Miller & Freuntz, "Probability & Statistics for Engineers", Prentice Hall of India, 8th Edition, 2010.

REFERENCES:

1. Gupta S P, "Statistical Methods" S Chand & Sons, New Delhi, 44th Edition, 2014
2. Pillai R S N & Bagavathi, "Statistics – Theory & Practice", S Chand Publishing,7th Edition, 1984
3. Leaf G A V, "Practical Statistics for the Textile Industry" Part I and II, Cornell University, 2009.

25BSTT13 - TECHNOLOGY OF PRE-SPINNING PROCESS

Course Objectives

- To enable the students to understand the theory of various operations carried out at different stages of pre-spinning processes and the construction of machinery used for preparatory

Course Outcomes

Upon completion of this course, the student shall be able to understand

- Processes involved in the conversion of fibre to yarn
- Functioning of ginning and blow room machinery
- Functioning of carding machines
- Functioning of comber preparatory and comber
- Functioning of draw frame and roving frame

CO Number	Course Outcome	Level
CO1	Explain the processes involved in the conversion of fibre to yarn.	Understand
CO2	Describe the functioning of ginning and blow room machinery.	Apply
CO3	Explain the working principles of carding machines	Understand
CO4	Describe the functioning of comber preparatory and comber machines.	Understand
CO5	Explain the operation of draw frame and roving frame.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**M**	**S**			
CO3	**S**		**M**		
CO4	**M**	**S**	**M**		
CO5			**S**	**M**	**S**

UNIT I INTRODUCTION

Sequence of spinning machinery for producing carded, combed and blended yarns in short staple spinning system; numbering systems for textile materials and conversions; influence of fibre characteristics on yarn spinnability, yarn quality and machine performance

UNIT II GINNING AND BLOWROOM MACHINERY

Description and working of different types of gins; ginning performance on yarn quality; blow room - objectives, principle and description of opening and cleaning, blending machines, scutcher, chutefeed, metal detectors, foreign matter detectors; cleaning efficiency, production calculations

UNIT III CARDING MACHINE

Objectives and principle of carding operations; study of carding machine; auto-levelling; card clothing and its maintenance; draft and production calculation

UNIT IV COMBER

Study of comber preparatory machines; objectives and principles of combing; sequence of combing operation; study of combing machine; combing efficiency and production calculation

UNIT V DRAWFRAME AND ROVING FRAME

Draw frame – objectives, construction of machine; drafting systems used in modern draw frames; auto-levelling; draft and production calculation; objectives of roving frame; working of roving frame; bobbin builder mechanism; draft, twist and production calculations; safety measures at pre-spinning processes – equipments used, safety practices**.**

TEXT BOOKS:

1. Klein W., "The Rieter Manual of Spinning, Vol.1", Rieter Machine Works Ltd., Winterthur,
2014, ISBN 10 3-9523173-1-4 / ISBN 13 978-3-9523173-1-0.
2. Klein W., "The Rieter Manual of Spinning, Vol.2", Rieter Machine Works Ltd., Winterthur,
2014, ISBN 10 3-9523173-2-2 / ISBN 13 978-3-9523173-2-7.
3. Klein W., "The Rieter Manual of Spinning, Vol.1-3", Rieter Machine Works Ltd., Winterthur,
2014, ISBN 10 3-9523173-3-0 / ISBN 13 978-3-9523173-3-4.

REFERENCES:

1. Lawrence C A, "Fundamentals of Spun Yarn Technology", CRC press, 2003, ISBN 1-56676-821-7
2. Oxtoby E, "Spun Yarn Technology ", Butterworth, Boston, London, 1987, ISBN: 0408014644 9780408014649
3. Lord P.R., "Yarn Production: Science, Technology and Economics", The Textile Institute, Manchester, 1999.
4. John A I, "Yarn Preparation: A Handbook", Intermediate Technology, London, 1992, ISBN:1853390429.
5. Doraiswamy I, Chellamani P, and Pavendhan A, "Cotton Ginning, Textile Progress", The Textile Institute, Manchester, 1993

25BSTT14 - CHARACTERISTICS OF TECHNICAL FIBRES

Course Objectives

To enable the students to understand the

- Structure and morphology of technical fibres
- Physical characteristics of technical fibres

Course Outcomes

Upon completion of this course, the student shall be able to understand the

- Structure and properties of fibres
- Method of investigation of structure of fibres
- Moisture properties of fibres
- Tensile and elongation properties of fibres
- Optical, thermal and frictional characteristics of fibres

CO Number	Course Outcome	Level
CO1	Explain the structure and properties of fibres.	Understand
CO2	Describe the methods of investigating the structure of fibres.	Apply
CO3	Analyze the moisture properties of fibres.	Understand
CO4	Evaluate the tensile and elongation properties of fibres.	Understand
CO5	Examine the optical, thermal, and frictional characteristics of fibres	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**M**	**S**			
CO3	**S**		**M**		
CO4	**M**	**S**	**M**		
CO5			**S**	**M**	**S**

UNIT I STRUCTURE OF FIBRES

Classification of fibres; study of morphological structures of fibers; physical properties of fibres; order and disorder in fibre structure; molecular conformations – planar zig-zag, helical, lamellar, and sperulite conformations.

UNIT II STRUCTURE INVESTIGATION TECHNIQUES

Transmission and Scanning electron microscopes-principle; construction and working; X-ray diffraction techniques – estimation of crystallinity; Infrared radiation and dichroism techniques; chemical element and group identification by transmittance and optical density methods, molecular
orientation estimation

UNIT III MOISTURE ABSORPTION CHARACTERISTICS

Theories of moisture sorption; moisture absorption behavior of natural and man-made fibres; influence of fibre structure, humidity and temperature on the moisture absorption; conditioning of fibres –mechanism of conditioning and factors influencing conditioning.moisture diffusion in fibres; heat of sorption – integral and differential, their relation; factors influencing heat of sorption - measurement of heat of sorption

UNIT IV TENSILE AND ELONGATION CHARACTERISTICS OF FIBRES 9

Tensile characteristics –study of strength, elongation, work of rupture, initial modulus, work factor and yield point – determination of yield point. stress-strain relations of natural and manmade fibres - influence of fibre structure, humidity and temperature on tensile characteristics. time effects study of creep phenomena. Elastic recovery and its relation to stress and strain of fibres; mechanical conditioning of fibres and its influence on elastic recovery. load cycling and extension cycling-their effect on elastic recovery. introduction about torsional and flexural rigidity of fibers

UNIT V OPTICAL, FRICTIONAL, AND THERMAL CHARACTERISTICS

Reflexion and lustre-objective and subjective methods of measurement - refractive index and its measurement - birefringence, factors influencing birefringence - absorption and dichroism friction –
static, limiting and kinetic friction, its measurement, comparison of fibres, directional friction in wool
– friction. thermal transitions of fibres - thermal conductivity, thermal expansion and contraction, Tg, melting; static electricity in textile fibres

TEXTBOOKS

1. Morton W E and Hearle J W S, “Physical Properties of Textile Fibres”, The Textile Institute, Washington D.C., 2008, ISBN978-1-84569-220-95
2. Hearle J.W.S., LomasB., and Cooke W.D.,“Atlas of Fibre Fracture and Damage to Textiles”, The Textile Institute, 2nd Edition, 1998, ISBN:1855733196

REFERENCES

1. Meredith R and Hearle J W S, “Physical Methods of Investigation of Textiles”, Wiley Publication, New York, 1989, ISBN: B00JCV6ZWU ISBN-13:
2. Mukhopadhyay S K, “Advances in Fibre Science”, The Textile Institute,1992, ISBN: 1870812379
3.Meredith R, “Mechanical Properties of Textile Fibres”, North Holland, Amsterdam,1986, ISBN: 1114790699, ISBN-13:9781114790698
4. Raheel M. (ed.)., “Modern Textile Characterization Methods”, Marcel Dekker, 1995, ISBN: 0824794737
5. Mukhopadhyay. S. K., “The Structure and Properties of Typical Melt Spun Fibres”, Textile Progress, Vol. 18, No. 4, Textile Institute, 1989, ISBN:1870812115
6. Hearle J.W.S., “Polymers and Their Properties: Fundamentals of Structures and Mechanics Vol1”, Ellis Horwood, England,1982, ISBN:047027302X| ISBN- 13:9780470273029
7. Greaves. P. H., and Saville B.P., “Microscopy of Textile Fibres”, Bios Scientific, U.K., 1995, ISBN: 1872748244 | ISBN-13:9781872748245
8. Seville. B. P., “Physical Testing of Textiles”, Woodhead Publishing, 1999, ISBN: 1855733676 | ISBN-13:9781855733671
9. Hearle J. W. S., and Peters. R. H., “Fibre structure”, Elsevier Ltd, 1963, ISBN: 1483212211 | ISBN-13:9781483212210

25BSTT15L – APPLIED PHYSICS AND CHEMISTRY LABORATORY

Course Objectives

- To experiment and define the various laws in physics and chemistry
- To apply and recognize the important laws in physics and chemistry

Course Outcomes

Upon successful completion of the course the student would be able to,

- Analyse the various laws and principles in physics
- Demonstrate various experiments to prove the laws like Young‟s modulus, Searle‟s viscometer and newton's rings
- Analyse the various laws and principles in chemistry

CO Number	Course Outcome	Level
CO1	Analyze the various laws and principles in physics	Understand
CO2	Demonstrate various experiments to prove laws like Young's modulus, Searle's viscometer, and Newton's rings.	Apply
CO3	Analyze the various laws and principles in chemistry.	Understand
CO4	Apply physics and chemistry concepts to real-world scenarios	Understand
CO5	Evaluate the significance of experimental results in scientific studies.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**M**	**S**			
CO3	**S**		**M**		
CO4	**M**	**S**	**M**		
CO5			**S**	**M**	**S**

LIST OF EXPERIMENTS:

Physics:

1. Young's Modulus – Non-uniform bending – Pin and microscope
2. Surface tension – Capillary rise method
3. Young's Modulus –Uniform bending – Pin and microscope

4. Surface tension and interfacial surface tension – Drop weight method
5. Newton's rings – Radius of curvature of the given lens
6. Viscosity of the liquid by poiseuilles method – viscosity co-efficient
7. Thickness of a wire - Air-wedge method

Chemistry:

1. Qualitative analysis of organic compounds: (Any 5 substances)
   Determination of aromatic / aliphatic, saturated / unsaturated, presence of special elements (Nitrogen, Sulphur, Halogens), presence of functional groups of the following compounds:
   a. Carbohydrates
   b. Phenol
   c. Aniline
   d. Aldehydes
   e. Carboxylic acids
   f. Amine
   g. Ketone

2. Quantitative analysis:
   a) Estimation of Sodium hydroxide,
   b) Estimation of Oxalic acid
   c) Estimation of Hardness.
   d) Estimation of FAS.
   e) Estimation of Chloride.

REFERENCES:

1. Thomas, A. O, 'Practical Chemistry', Kannur Scientific Book Centre, 2009.
2. Venkateswaran V., Veeraswamy R. & Kulandaivelu A. R, 'Basic Principles of Practical Chemistry', S Chand & Sons, New Delhi, 2015.

25BSTT16L – PRE-SPINNING LABORATORY

COURSE OBJECTIVES:

To enable the students to learn material passage in the spinning preparatory machines and identify the parts of machine and carryout production, draft and twist calculations.

COURSE OUTCOMES:

Upon completion of this course, the student shall be able to

- Understand the material passage in the spinning preparatory machines and draw gearing diagram
- Identify the components of blow room, carding machine, draw frame, comber and speed frame
- Calculate draft, twist and production rate
- Calculate degree of cleaning in blowroom, card and comber.

CO Number	Course Outcome	Level
CO1	Understand the material passage in spinning preparatory machines and draw gearing diagrams.	Understand
CO2	Identify the components of blow room, carding machine, draw frame, comber, and speed frame.	Apply
CO3	Calculate draft, twist, and production rate.	Understand
CO4	Calculate the degree of cleaning in blow room, card, and comber.	Understand
CO5	Analyze the efficiency and performance of spinning preparatory machines.	Analyze

	MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**M**	**S**			
CO3	**S**		**M**		
CO4	**M**	**S**	**M**		
CO5			**S**	**M**	**S**

LIST OF EXPERIMENTS

Fiber

1. Fiber identification by microscopic analysis
2. Fiber identification by Solubility test
3. Fiber identification by burn test
4. Fiber length analysis by Bare sorter
5. Fiber fineness measurement using micronaire
6. Fiber blend analysis

Yarn

1. Construction details of blow room machines and material passage
2. Cleaning intensity and production calculations in blow room
3. Construction details of carding machine and the material passage
4. Draft and production calculations in carding machine
5. Wire point specifications and settings in carding machine
7. Construction details of drawing machine, material passage, draft and production calculations
2. Construction details of comber and material passage
3. Combing cycle, draft and production calculations
4. Construction details of roving machine, material passage
5. Draft, Twist and production calculations in roving machine
6. Study of builder mechanism of roving machine
7. Determination of degree of openness of fibre at blow room
8. Determination of neps count of card and comber web
9. Determination of actual roller speed, eccentricity of roller and top arm loading

REFERENCES:

1. Mishra, S. P, 'A Text Book of Fibre Science and Technology', New Age International Pvt. Ltd.

2. Corbman, B. P, 'Textiles: Fibre to Fabric' International students Edition, McGraw Hill Book Company, Singapore.

SEMESTER II

25BSUG21T- TAMIL – II

குறிக்கோள்கள்:

- மாணவர்களின் மனநலத்துக்கும் வருங்கால வாழ்வுக்கும் உதவும் வகையில் இலக்கியப் பயிற்சி அளித்தல்
- அறம் சார்ந்த வாழ்வியல் விழுமியங்களைக் கற்பித்தல்
- சமயங்களை பற்றி மாணவர்களுக்கு உணர்த்துதல்
- வாழ்வில் கடை பிடிக்க வேண்டிய ஒழுங்குமுறைகளை இலக்கியங்கள் மூலம் கற்றல்
- தமிழர் வீர விளையாட்டுகளை குறுநாவல் வழி கற்றல்

CO No.	Course Outcome	Level
CO1	Gain literary exposure that supports students' mental well-being and future life understanding.	Understand
CO2	Learn virtuous life principles rooted in ethics through classical Tamil literature.	Apply
CO3	Develop awareness about religions and their influence through literary narratives.	Understand
CO4	Understand and follow discipline and order in life through literary teachings.	Apply
CO5	Learn about Tamil martial sports and traditional practices through short novels.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**				**s**
CO2			**M**		**S**
CO3	**M**				**s**
CO4		**S**	**S**		**M**
CO5	**S**			**M**	**M**

அலகு - 1

திருக்குறள் - 1. ஊக்கமுடைமை 2.செய்நன்றியறிதல்

நாலடியார் - 1. பொறையுடைமை (5 பாடல்கள்) 2. பெரியாரைப்பிழையாமை (5 பாடல்கள்)

அலகு - 2

திருஞானசம்பந்தர் தேவாரம் – கோளறுதிருப்பதிகம் (10 பாடல்கள்) பெருமாள் திருமொழி - 11 பாடல்கள் . இயேசுகாவியம் – பாரச்சிலுவை (8 பாடல்கள்) சீறாப்புராணம் - கடவுள் வாழ்த்து (5 பாடல்கள்)

அலகு – 3 - இலக்கணம்

பவணந்தி முனிவர் - நன்னூல் - எழுத்து - மாணாக்கனது வரலாறு பாடங் கேட்டலின் வரலாறு

அலகு – 4 – உரைநடைப் பகுதி

1. நல்லதை நோக்கி நடப்போம் - சுகி சிவம்
2. கல்வியும் கடவுட் தன்மையும் - வெ. இறையன்பு
3. அக்னிச் சிறகுகள் (அத்தியாயம் 1) முனைவர். எ பி ஜே அப்துல் கலாம்
4. அன்பிற் சிறந்த தவமில்லை - தமிழருவி மணியன்
5. சாதனை படைக்கும் சிந்தனைகள் - உயர்வளிக்கும் எண்ணங்கள் – டாக்டர். சிவசூரியன்

அலகு – 5

வாடி வாசல் (நாவல்) – சி.சு.செல்லப்பா – காலச்சுவடு பதிப்பகம்

குறிப்பு புத்தகம்:

1. நல்லதை நோக்கி நடப்போம் - சுகி சிவம்
2. கல்வியும் கடவுட் தன்மையும் - வெ. இறையன்பு
3. அக்னிச் சிறகுகள் (அத்தியாயம் 1) முனைவர். எ பி ஜே அப்துல் கலாம்
4. தமிழருவி மணியன் - அன்பிற் சிறந்த தவமில்லை
5. டாக்டர். சிவசூரியன் - சாதனை படைக்கும் சிந்தனைகள் - உயர்வளிக்கும் எண்ணங்கள்
6. பவணந்தி முனிவர் – நன்னூல்
7. சி.சு.செல்லப்பா – காலச்சுவடு பதிப்பகம்

25BSUG21H - HINDI – II

Course Objectives:

- To enable the students to know about the Modern Trends in Literature as the contemporary literature deals with the changing trends in the socio-economic cultural revolution taking place in the social system.
- To introduce the importance of letter writing, dialogue writing and applied grammar in Hindi literature.

Course Outcomes:

- Students can avoid grammatical mistakes.
- To know the letter writing methods, and how to write laghu kathayem by studying the stories.

CO No.	Course Outcome	Level
CO1	Understand basic Hindi grammar rules to avoid common mistakes.	Understand
CO2	Apply correct grammar in written and spoken Hindi.	Apply
CO3	Learn the format and method of formal and informal letter writing in Hindi.	Understand
CO4	Analyze short stories (Laghu Kathayein) to improve writing skills.	Analyze
CO5	Develop the ability to write creative short stories independently.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**		**S**		**S**
CO2	**S**			**S**	**M**
CO3	**M**		**S**	**M**	**S**
CO4	**S**			**M**	**M**
CO5	**S**	**M**	**S**		**M**

UNIT I

1. Sawal, 2. Jeevan ki theen pradhan bathem, 3. Do Chere.

UNIT II

Lagu Kathayem: 1. Fees, 2. Risthe, 3. Kelne ke din, 4. Kamra

UNIT III

Applied Grammar: 1. Line Badaliye, 2. Vachan Badaliye, 3. Vachya Badaliye, 4. Ulte arthavale shabda likiye, 5. Karak cinhom se bariye, 6. Vakyom mem prayog kijiye, 7. Kaal Badaliye, 8.Shudda kijiye.

UNIT IV

Vakya ke liye ek Shabda (one word for one sentence).

UNIT V

Letter Writing: 1. Leave letter, 2. About a tour from the college, 3. About a function celebrated in the college, 4. Applying for the job, 5. Ordering for the books.

TEXT BOOKS:

1. Hiranmay, 'Hindi Gadhya Prabakar', Shiksha Bharathy, Kashmiri Gate, New Delhi - 6
2. Prakashan V, 'Bharathi Gadhya Sangrah', New Delhi.
3. From Laghu Katha.com.
4. Sugam Hindi Vyakaran, Siksha Bharathi Madarsa Road, Kashmiri Gate, New Delhi.
5. Abhinav Pathra Lekhan by D.B.H. Prachar Sabha, Chennai – 17.

25BSUG22 - TECHNICAL ENGLISH - II

Course Objectives:

- To enhance ability and skills of the students to comprehend technical texts
- To develop their speaking skills in paper presentation, discussions etc.
- To acquire proper writing skill for reports, and official communications
- To facilitate them to acquire proper pronunciation skills.

Course outcomes:

- Listening, Reading and Comprehending technical texts, lectures, and talks
- Speaking in formal and informal situation
- Writing reports, Curriculum vitae, Circular, Notice and Minutes
- Acquiring phonetic skills

CO No.	Course Outcome	Level
CO1	Listen, read, and comprehend technical texts, lectures, and talks effectively.	Understand
CO2	Speak confidently in both formal and informal contexts.	Apply
CO3	Write professional documents such as reports, curriculum vitae, circulars, notices, and minutes.	Create
CO4	Demonstrate correct pronunciation using phonetic skills.	Apply
CO5	Analyze and interpret information from various technical and communicative sources.	Analyze

	MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**		**S**		**M**
CO2	**M**			**S**	**S**
CO3	**S**		**S**	**M**	**M**
CO4				**M**	**S**
CO5	**S**	**M**	**S**		**M**

UNIT I: Applied Phonetics

The phonological system in English – speech sounds – stress, rhythm – strong and weak forms – pitch and intonation

UNIT II: Technical Proposals

Definition and key factors – types – contents – format – evaluation

UNIT III: Formal reports

Definition – preparatory steps – types – structure – textile vocabulary

UNIT IV: English for specific purpose

Business communication – competitive examinations (TOEFL etc.) – paper presentations – description and demonstration, advertisement – notices, agenda and minutes

UNIT V: Career skills

Curriculum vitae and cover letters – soft skills – mock interviews – group discussion – personality traits

TEXT BOOKS:

1. Raman M, Sharma, Sangeetha, 'Technical Communication Principles and Practice', Oxford Univeristy Press, New Delhi, 2014
2. Means, Thomas L and Langlois E, 'English & Communication for Colleges', Cengage Learning, USA, 2007

25BSTT21 – MATHEMATICAL DATA ANALYSIS

Course objectives

- To acquaint students with basic concepts related time series, sampling, scaling and data collection techniques.
- To acquaint students to analyses the data using statistical tools.
- To acquire the practical knowledge of analysis of data through EXCEL and SPSS.

Course outcomes

On successful completion of the course, students will be able to:

- Know the practical issues arising in sampling studies.
- Appropriately interpret results of analysis of variance tests
- Design experiments, carry them out, and analyze the data they yield.
- Preparation of project report

CO No.	Course Outcome	Level
CO1	Understand the practical issues arising in sampling studies.	Understand
CO2	Interpret the results of analysis of variance (ANOVA) tests appropriately.	Analyze
CO3	Design statistical experiments for data collection.	Create
CO4	Conduct experiments and analyze the data they yield.	Apply, Analyze
CO5	Prepare and present a structured project report.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1			**M**		
CO2			**S**		
CO3	**M**		**S**		
CO4		**M**	**S**		
CO5				**M**	**S**

Unit – I

Concept of time series – Source of time series data – Component of time series – Additive and Multiplicative models – Resolving the components of time series –Trend – Methods of measuring trend

Unit – II

Sampling design – Census and sample survey – Implication of sample design – Sampling procedure – Characteristic – Types – Measurement and Scaling techniques - Measurement of scales – Scaling – Scale classification bases - Scale construction techniques – Methods of data collection – Primary and secondary data - Observation, interview, survey- data classification and tabulation-Case study method

Unit – III

Data Analysis: Hypothesis testing-Introduction, procedure, one tail, two tail tests-Tests involving population mean-Errors in hypothesis testing- Chi square test- One way ANOVA – Non parametric tests- multiple correlation and regression.

Unit – IV

Through EXCEL:

1. Mathematical functions (SUM ( ), MAX ( ), MIN ( ), COUNT ( ), AVERAGE ( ) combining basic function(MAX,MIN)
2. Illustrate year-wise performance of sales, purchase, profit of company by using chart wizard.
3. Aggregation Functions (SUM IF, COUNT IF)
4. Regression Analysis (FORECAST and TREND)
5. Mini Project – Apply necessary Excel tools to analyse textile database

Through SPSS:

1. Functions of Statistics (Classification, Diagrams and Graphical representation of Data)
2. Descriptive Statistics
3. Calculation of Probabilities under various distributions
4. Correlation & Regression – Partial and Multiple Correlations, Multiple Regression
5. Confidence Intervals for mean, variance, proportions
6. Inferential Statistics for Single through multiple samples. (Chi – Square, t, F and z test)
7. Non – Parametric tests.
8. Experimental Design: One way ANOVA, Two way ANOVA – Factorial designs – Multiple comparison tests
9. Mini Project – Apply necessary tools to analyze textile database

Unit – V

Project report preparation and interpretation- steps in writing report-types of report

NOTE: Class: 50% theory and 50% practical

Reference Books:

1. Goon A M, Gupta M K and Das Gupta B, 'Fundamentals of Statistics V-II', The world press Ltd., Culcutta, 1994.
2. Croxton, 'Applied General Statistics'.
3. Gupta S.C, Kapoor V.K, 'Fundamentals of Applied Statistics', Sultan Chand & Sons, New Delhi, 2007
4. Kapoor VK and Gupta SC, 'Fundamentals of Mathematical Statistics', Sultan Chand and sons, New Delhi, 1986
5. Hoel P.G, 'Introduction to Statistics', Asia Publishing Housing Pvt Ltd, New Delhi,1957
6. 'Using Excel for Business Analysis' - Danielle Stein Fairhurst, WILY.
7. Kothari C. P, 'Research Methodology', New age International, 2013

25BSTT22 - YARN SPINNING FOR TECHNICAL TEXTILES

Course Objective:

To enable the students to understand the

- Theory of yarn formation by differeMANnt spinning systems
- Construction of yarn spinning machines
- and to practice the students to prepare yarn using ring and rotor spinning machine.

Course Outcome:

Upon completion of this course, the student shall be able to

- Understand the theory of formation of yarn by ring spinning system and construction of machine
- Understand the features and elements of ring spinning machine and its automation, principle of compact spinning system,
- Understand the working of rotor spinning and design features of important elements
- Understand the working principle of friction, air vortex, air jet and other spinning system
- Understand the concept and production of ply yarns and fancy yarns

CO No.	Course Outcome	Level
CO1	Understand the theory of yarn formation in ring spinning and machine construction	Understand
CO2	Understand the features, elements, automation, and compact spinning principles of ring spinning.	Understand
CO3	Understand the working and design features of rotor spinning systems.	Understand
CO4	Conduct experiments and analyze the data they yield.	Understand
CO5	Understand the concept and production techniques of ply yarns and fancy yarns	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**M**			
CO3	**S**	**M**			
CO4		**S**	**S**		
CO5	**M**		**S**		

UNIT I RING SPINNING - I

Principle of yarn formation in ring frame-drafting, twisting and winding; mechanism of cop building,
top arm loading; draft, twist and production calculations

UNIT II RING SPINNING – II

Design features of important machine elements of ring frame – ring, traveller, spindle, drive arrangement; end breakage rate – causes and remedies; automations; condensed yarn spinning – principle, different methods, properties; comparison with ring spun yarn

UNIT III ROTOR SPINNING

Principle of open end spinning; principle of yarn production by rotor spinning system; design features of important elements used in rotor spinning; techno economic study of rotor spinning

UNIT IV OTHER SPINNING SYSTEMS

Friction, air vortex and air-jet spinning systems – principle of yarn production, raw material used, structure, properties and applications; principle of yarn production by self-twist, core, wrap, adhesive, electrostatic, disc spinning systems

UNIT V PLYING AND FANCY YARN SPINNING

Merits of plying of yarns; methods followed for plying – TFO, ring twisting; selection of twist level for plying; calculation of resultant count of plied yarns; fancy yarns- types, method of production; safety measures at spinning machines – equipments used, safety practices

Text Books:

- Klein W., and Stalder H., "The Rieter Manual of Spinning, Vol.4", Rieter Machine Works Ltd.,Winterthur, 2014, ISBN: 10 3-9523173-4-9 / ISBN: 13 978-3-9523173-4-1.
- Stalder H., "The Rieter Manual of Spinning, Vol.5", Rieter Machine Works Ltd., Winterthur,2014, ISBN: 10 3-9523173-5-7 / ISBN: 13 978-3-9523173-5-8.

REFERENCES

- Stalder H., "The Rieter Manual of Spinning, Vol.6", Rieter Machine Works Ltd., Winterthur,2014, ISBN: 10 3-9523173-6-5 / ISBN: 13 978-3-9523173-6-5.
- Oxtoby E., "Spun Yarn Technology", Butterworth Publications, London, 1987.
- Brayshaw. J, and Backe.E, "Short-staple Ring Spinning, Textile Progress", The Textile Institute, Manchester, 1999, ISBN: 0890898979 | ISBN-13: 9780890898970
- Iredale J., "Yarn Preparation: A Handbook", Intermediate Technology, 1992, ISBN: 1853390429 | ISBN-13: 9781853390425
- Lawrence C. A., "Advances in Yarn Spinning Technology", Wood Head publishing, 2010,ISBN:1845694449 | ISBN-13: 9781845694449

25BSTT23 - TECHNOLOGY OF PRE-WEAVING PROCESS

OBJECTIVE:

- To enable the students to understand the theory of preparation of yarn for fabric formation and functioning of various preparatory machines

OUTCOMES:

Upon completion of this course, the student shall know about

- Objectives of working principle of winding machines
- The machine and process parameters in winding
- Objectives and working of warping and sizing machines
- The process control in warping and sizing
- Drawing – in and denting process

CO No.	Course Outcome	Level
CO1	Understand the objectives and working principles of winding machines.	**Understand**
CO2	Understand the machine and process parameters involved in winding.	**Understand**
CO3	Understand the objectives and working of warping and sizing machines	**Understand**
CO4	Understand the process control techniques in warping and sizing	**Understand**
CO5	Understand the drawing-in and denting processes	**Understand**

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**	**S**			
CO2	**M**	**S**			
CO3	**S**	**S**			
CO4		**S**	**S**		
CO5		**M**	**M**		

UNIT I WINDING MACHINE

Objectives of winding; principles and study of precision and drum winding machines; uniform build of yarn package; types of drums – half accelerated and fully accelerated drums; weft winding; winding for colouration; sewing thread winding; production calculations

UNIT II PROCESS CONTROL IN WINDING

Classification of yarn faults and its removal; concepts in yarn clearing – mechanical, optical and electronic clearers; package defects - causes and remedies; winding synthetic and blended

yarns; winding performance and maintenance; material handling; knotters and splicers - quality of knots and splices

UNIT III WARPING AND SIZING MACHINES

Objectives of warping, material flow in beam warping and creels used in warping machines; sectional warping machines; objectives of sizing, sizing materials and recipe used for different
types of fibres, size preparation; study of sizing machine; concept of single end sizing, combined dyeing and sizing; production calculations.

UNIT IV PROCESS CONTROL IN WARPING AND SIZING

Warping defects – causes and remedies, sizing defects – causes and remedies; control of yarn breaks, hard waste in warping; sizing of filament yarns; control systems used in sizing machine;
size pickup control

UNIT V DRAWING-IN

Need for drawing-in operation; manual and automatic drawing-in, denting, leasing; knotting machines; selection and care of reeds, heald wires and drop pins, control of cross ends and extra
ends and calculations; safety measures at pre-weaving processes -equipment's used, safety practices.

TEXT BOOKS:

- Baneerjee.P.K., "Principles of Fabric Formation", CRC Press, London, 2014, ISBN Number:13:978-1-4665-5445-0.
- Majumdar A, Das A, Alagirusamy R, and Kothari V K, "Process Control in Textile Manufacturing", Wood Head Publishing Limited, Oxford, 2013, ISBN: 978-0-85709- 027-0.
- Goswami B.C., Anadjiwala R.D. and Hall D.M.., "Textile Sizing"., Marcel Dekker, NewYork, 2004,ISBN: 0-8247-5053-5.

REFERENCES:

- John A. I, "Yarn Preparation: A Hand Book", Textile Institute, Manchester, 1992, ISBN:1853390429.
- Ormerod A. and Sondhelm W. S., "Weaving: Technology and Operations", Textile Institute,1995, ISBN: 187081276X.
- Milind V K, "Fundamentals of Yarn Winding", Woodhead Publishing, India, 2013,ISBN: 978-1-78242-068-2.

25BSTT24 - TECHNOLOGY OF MANUFACTURED FIBRE PRODUCTION

OBJECTIVES:

To make the students understand different methods of production of manmade fibres and post spinning operations

OUTCOMES:

Upon completion of the course, the student shall know about the

- Synthesis of polymers
- Melt spinning of polymers
- Solution spinning of polymers
- Drawing and spin finish of fibres and filaments
- Heat setting and texturising process

CO No.	Course Outcome	Level
CO1	Understand the synthesis process of polymers used in fibre manufacturing.	**Understand**
CO2	Understand the principles and process of melt spinning of polymers..	**Understand**
CO3	Understand the techniques involved in solution spinning of polymers.	**Understand**
CO4	Understand the drawing and spin finishing of fibres and filaments.	**Understand**
CO5	Understand the processes of heat setting and texturising of synthetic fibres.	**Understand**

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**		**M**		
CO2	**S**	**M**			
CO3	**S**	**M**			
CO4	**M**	**S**	**M**		
CO5	**M**	**S**			

UNIT I POLYMER PREPARATION

Monomer used for polymer preparation, methods of polymerization of different fibers; polymer
rheology-Newtonian and non-Newtonian fluids.

UNIT II MELT SPINNING

Melt Spinning- polymer selection and preparation, equipments, testing of filament, properties and applications of polyester, polyamide and polypropylene fibres; process control

UNIT III SOLUTION SPINNING

Solution spinning- polymer selection and preparation, equipments, testing of filament, properties and applications of acrylic, polyurethane and regenerated cellulose fibres; process control

UNIT IV DRAWING AND SPIN FINISH

Neck drawing, drawing systems, influence of drawing on structure and properties of various fibres; spin finish – requirements, compositions and methods of application;

UNIT V HEAT SETTING AND TEXTURING

Types of heat setting, influencing parameters on heat setting, influence of heat setting on various fibre properties; texturizing – principles and methods

TEXTBOOKS

- Kothari V. K., "Textile Fibres: Development and Innovations", Vol. 2, Progress in Textiles, IAFL Publications, New Delhi, 2000, ISBN: 81-s901033-0-X.
- Gupta V. B., and Kothari V. K., (Editors), "Manufactured Fibre Technology", Kluwer Academic Publishers, 1997, ISBN 0412-54030-4.

REFERENCES

- Vaidya A. A., "Production of Synthetic Fibres", Prentice Hall of India Pvt. Ltd., New Delhi, 1988.ISBN: 0876925786 / ISBN: 9780876925782.
- Cook J. G., "Handbook of Textile Fibres: Vol. 2: Man Made Fibres", The Textile Inst., 5th Ed., 1984, ISBN: 1855734850.
- Srinivasa Murthy H. V., "Introduction to Textile Fibres", Textile Association, India, 1987.
- Nakasjima (English edition, edited by Kajiwara K. and McIntyre J. E.), "Advanced Fibre Spinning Technology", Wood head Publication Ltd., England, 1994, ISBN: 1855731827.

25BSTT25L – PRE-WEAVING LABORATORY

Course Objective:

- To enable the students to practically understand the mechanisms of loom

Course Outcome:

Upon completion of this practical course, the students will be able to

- Test and analyze the yarn faults
- Control the weaving mechanism in consideration with fabric quality and loom performance
- Produce the woven fabric samples in power loom.

CO No.	Course Outcome	Level
CO1	Test and analyze various yarn faults and their impact on fabric quality	**Understand**
CO2	Understand and control the weaving mechanism with respect to loom performance and fabric quality.	**Understand**
CO3	Understand the techniques involved in solution spinning of polymers.	**Understand**
CO4	Understand the drawing and spin finishing of fibres and filaments.	**Understand**
CO5	Understand the processes of heat setting and texturising of synthetic fibres.	**Understand**

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**		**s**		
CO2	**S**	**S**	**M**		
CO3	**S**	**S**			
CO4	**M**		**S**		
CO5	**S**	**S**	**M**		

List of Experiments

1. Measurement and analysis of yarn faults
2. Determination of package density of cones
3. Soft winding for yarn dyeing
4. Creel warping
5. Sectional warping
6. Size paste preparation
7. Size paste application
8. Drafting and Looming-in of warp sheets

25BSTT26L – YARN SPINNING LABORATORY - II

COURSE OBJECTIVES:

To enable the students to learn material passage in the spinning preparatory machines and identify the parts of machine and carryout production, draft and twist calculations.

COURSE OUTCOMES:

Upon completion of this course, the student shall be able to

- Understand the material passage in the spinning machines
- Identify the components of various spinning techniques
- Calculate draft, twist and production rate

CO No.	Course Outcome	Level
CO1	Understand the material passage in different spinning machines.	**Understand**
CO2	Identify the components involved in various spinning techniques.	**Remember**
CO3	Calculate draft, twist, and production rate of spinning systems.	**Apply**
CO4	Interpret machine settings based on required yarn specifications.	**Analyze**
CO5	Evaluate the performance of different spinning systems based on output parameters.	**Evaluate**

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**		**s**		
CO2	**S**	**S**	**M**		
CO3	**S**	**S**			
CO4	**M**		**S**		
CO5	**S**	**S**	**M**		

LIST OF EXPERIMENTS

1. Construction details of ring spinning machine and material passage
2. Draft, Twist and production calculations in ring spinning machine
3. Study of builder mechanism of ring spinning machine
4. Construction details of rotor spinning machine and material passage
5. Draft, Twist and production calculations in rotor spinning machine
6. Production of yarn using ring spinning machine from fibre
7. Production of yarn using rotor spinning machine from fibre

REFERENCES:

1. Mishra, S. P, 'A Text Book of Fibre Science and Technology', New Delhi: New Age International Pvt. Ltd, (2000).

2. Corbman, B. P, 'Textiles: Fibre to Fabric. Singapore', International students Edition McGraw Hill Book Company, (2000).

25BSTT27 – YOGA FOR HUMAN EXCELLENCE#

Course Objectives

- To know about the importance of Physical Exercises, yogasana and meditation
- To empower the students with knowledge about the mind and its functions

Course outcomes

Upon successful completion of this subject, the students should be able to:

- Develop good physical and mental strength
- Live a stress free and balanced lifestyle

CO No.	Course Outcome	Level
CO1	Understand the importance of maintaining good physical and mental health.	**Understand**
CO2	Practice techniques to develop physical strength and flexibility.	**Apply**
CO3	Apply mindfulness and breathing techniques to reduce stress..	**Apply**
CO4	Demonstrate habits that contribute to a balanced lifestyle.	**Apply**
CO5	Evaluate personal well-being and make lifestyle adjustments for long-term health.	**Evaluate**

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1					**S**
CO2					**S**
CO3					**S**
CO4				**M**	**S**
CO5				**M**	**S**

UNIT I: Yoga Types

Types of yoga – karma yoga – bhakthi yoga – raja yoga – gnana yoga – hata yoga. agna-santhi – clearence – thuriya – thuriyatheetham.

UNIT II: Yogasana, Varma Art and Naturopathy

Padmasana, halasana, vajrasana, sukasana, chakrasana (side posture), viruchasana, bhujangasana, yoga mudra, ustrasana, maha mudra, vakkarasana. art of varma – philosophy of varma – practices – benefits – methods of naturopathy.

UNIT III: Simplified Physical Exercises

Physical exercises – hand exercises – leg exercises – breathing exercises – eye exercises – kapalabathi – makarasana – body massage – acupressure – relaxation science and total consciousness – integrated approach.

UNIT IV: Personality Development

Introspection – analysis of thoughts – moralization of desire – neutralization of anger – eradication of worries – benefits of blessing.

UNIT V: Life lessons

Divine thoughts of Bharathiar – Concepts of Ramalinga Vallalar Vethathirian principles – Practical solutions of Vethathirian philosophy.

TEXT BOOK:

1. "Simplified Physical Exercises", Vedhathiri Maharishi Pathipagam, 180, Gadhiji Road, Erode – 638001.

REFERENCES:

1. Nagendra H.R, "Yoga its Basis and Applications", S-VYASSA publications.
2. "New perspective in stress Management (SMET)", S-VYASSA publications.
3. "My Life History", Thathuvagnani Vethathiri Maharishi, 180, Gadhiji Road, Erode
4. "Patanjali's Yoga Sutras", S-VYASSA publications.
5. "Yoga – Breathing Practices", S-VYASSA publications.

SEMESTER III

25BSTT31 – TECHNICAL FABRIC MANUFACTURING

Course Objective

To enable the students to learn the

- Basics of weaving machine and important motions of looms
- Selection and control of process variables during fabric formation

Course Outcomes

Upon completion of this course, the student shall be able to understand the

- Basics of weaving operation and tappet shedding
- Working of dobby and Jacquard shedding mechanism
- Principle of weft insertion in shuttle and shuttleless weaving
- Beatup, secondary and auxiliary motions
- Control of process variables at loom and understand the principle of producing special fabrics

CO No.	Course Outcome	Level
CO1	Understand the basics of weaving operation and tappet shedding mechanism.	**Understand**
CO2	Understand the working principles of dobby and Jacquard shedding mechanisms.	**Understand**
CO3	Explain the principles of weft insertion in shuttle and shuttleless weaving systems.	**Understand**
CO4	Understand the beat-up motion, secondary, and auxiliary motions in weaving.	**Understand**
CO5	Analyze process variables at the loom and understand the principles of producing special fabrics.	**Analyze**

	MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**M**			
CO3	**S**	**S**			
CO4	**M**	**S**			
CO5	**M**	**S**	**S**		

UNIT I INTRODUCTION TO WEAVING AND TAPPET SHEDDING

Yarn quality requirements for different looms; principle of weaving - primary, secondary and auxiliary motions; loom timing; shed geometry and shedding requirement; types of shed; tappet shedding - positive and negative; shedding by link mechanism, reversing mechanisms; kinetics of heald shaft

UNIT II DOBBY AND JACQUARD SHEDDING

Dobby and jacquard shedding mechanisms- type, drive arrangement and principle of working; electronic dobby and jacquards; pattern card preparation; harness tie-up used in jacquards

UNIT III WEFT INSERTION

Shuttle – construction, types; shuttle picking and checking mechanisms, shuttle flight timing; mechanism of weft insertions in shuttleless looms - projectile, rapier, air-jetand water-jet; multiphase weaving systems

UNIT IV BEAT UP, SECONDARY AND AUXILARY MOTIONS

Kinematics of sley, sley eccentricity; beat up mechanism in modern looms;take up and let-off motions; warp protector and, warp and weft stop motion; automatic weft replenishment in shuttle looms – pirn changing and shuttle changing mechanism; multi shuttle looms- box changing principle; weft accumulators in shuttleless looms; selvedges – types, formation techniques

UNIT V PROCESS CONTROL & SPECIAL WEAVING PROCESS

Techno economics of shuttleless loom; loom monitoring and control, loom stoppages and efficiency; fabric defect - analysis and grading, causes and remedies;filament weaving – silk &texturized yarns; principles and mechanisms in weaving - pile fabrics, tapes, tri-axial and 3D fabrics; loom production calculation; safety measures to be taken at weaving industry..

TEXT BOOKS:

- Talukdar. M.K., Sriramulu. P.K., and Ajgaonkar. D.B., "Weaving: Machines, Mechanisms & Management", Mahajan Publishers, Ahmedabad, 1998, ISBN: 81-85401-16-0.
- Booth. J.E., "Textile Mathematics Volume 3", The Textile Institute, Manchester, 1977, ISBN:090073924X.

REFERENCES:

- Marks R., and Robinson. T.C., "Principles of Weaving", The Textile Institute, Manchester,1989, ISBN: 0 900739 258.
- Adanur. S, "Handbook of Weaving", Technomic Publishing Co. Inc., 2001, ISBN:1587160137 | ISBN-13: 9781587160134
- Vangheluwe L., "Air- Jet Weft Insertion", Textile progress, Vol. 29, No. 4, Textile Institute Publication, 1999, ISBN; 1870372255.
- Valeriy V C, Palitha B, and Elena V C, "Mechanisms of Flat Weaving Technology", Wood Head Publishing, 2013, ISBN: 0857097806 | ISBN-13: 9780857097804
- Banerjee PK, "Principles of Fabric Formation", CRC Press, 2014, ISBN:1466554444 | ISBN-13: 9781466554443
- Majumdar A, Das A, Alagirusamy R, and Kothari V.K., " Process Control in Textile Manufacturing", Wood Head publishing, 2012, ISBN: 0857090275 | ISBN-13: 9780857090270
- "Weaving: The knowledge in Technology", Papers Presented at the Textile Institute Weaving Conference 1998, Textile Institute, ISBN: 1870372182 ISBN-13: 9781870372183.

25BSTT32 – MODERN KNITTING TECHNOLOGY

Course Objectives

To enable the students to learn about

- Fundamentals of knitting
- Types of knitting processes in detail
- Functioning of different components of knitting machine

Course Outcomes

Upon completion of this course, the student shall know the

- Type of knitting processes, yarn requirements for knitting
- Principle of knitting in different types of knitting machines
- Basic weft knitted structures, flat knitting process
- Functioning of weft knitting machines
- Functioning of warp knitting machines

CO No.	Course Outcome	Level
CO1	Understand the types of knitting processes and yarn requirements for knitting.	**Understand**
CO2	Explain the principles of knitting in various types of knitting machines.	**Understand**
CO3	Describe basic weft knitted structures and the flat knitting process.	**Understand**
CO4	Understand the functioning and operations of weft knitting machines.	**Understand**
CO5	Understand the functioning and applications of warp knitting machines.	**Understand**

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**S**			
CO3	**S**	**M**			
CO4	**M**	**S**			
CO5	**M**	**S**	**S**		

UNIT I INTRODUCTION

Reasons for the growth of the knitting industry; comparison of fabric properties - woven, knits and bonded fabrics; classification of knitting processes – weft knit & warp knit; yarn quality requirements for knitting; preparation of staple yarns for weft and warp knitting. General definitions and principles of knitting; types of knitting needles – Bearded, Latch & Compound needle; elements of knitted loop structure

UNIT II WEFT KNITTING

Basic weft knitted structures and their production - plain, rib, interlock and purl; fundamentals of formation of knit, tuck and float stitches; factors affecting the formation of loop; effect of loop length and shape on fabric properties; analysis of various types of weft knitted structures; weft knitted fabric geometry; basic principles and elements of flat knitting machines; different types of flat knitting machines- manual, mechanical and computer controlled; production of various weft knitted structures using flat knitting machines;

UNIT III WEFT KNITTING MACHINE

Construction, characteristics and working of circular knitting machines used for the production of basic structures; production of derivatives of weft knitted structures; needle control in circular knitting machines; quality control in knitted fabric production; production calculation; safety measures to be taken at knitting industry; process control in weft knitting

UNIT IV WARP KNITTING

Basic principles; elements of warp knitted loop – open loop, closed loop; warp knitting elements chain link, chain links for simple patterns, guide bar movement mechanism; Tricot and Rachel warp knitting machines; principles of double needle bar patterning, terry pile fabric production; let off system; run in value based on the lapping diagram; take up system; theoretical concepts of warp knitted loop configuration

UNIT V WARP KNITTING

Uses of warp knitted fabrics in technical applications

TEXT BOOKS:

1. Ajgaonkar, D. B, 'Knitting Technology', Universal Publication Corporation, Bombay, 1998.

2. Spencer, D. J, 'Knitting Technology', 3rd Edition, Textile Institute Publication, Manchester, UK, 2001.

REFERENCES:

1. Paling D. F, 'Warp Knitting Technology', Columbine Press, Buxton, 1992.

2. Brackenbury T, 'Knitted Clothing Technology', Blackwell Science Ltd, UK, 1992.

3. Wilkens C, 'Warp Knit Machine Elements', Blackwell Science Ltd, UK, 1997.

4. Anbumani N, 'Knitting Fundamentals, Machines, Structures and Developments', New Age International (P) Ltd, New Delhi, 2007.

5. Spencer D. J, 'Knitting Technology – A Comprehensive Handbook and Practical Guide', 3rd Revised Edition. Wood head Publishing, 2001.

6. Ray S. C, 'Fundamentals and Advances in Knitting Technology', Woodhead Publishing, CRC Press, New Delhi, 2012.

25BSTT33 – TECHNOLOGY OF NON WOWENS AND BONDED FABRICS

Course Objectives

- To understand the fundamentals of various production processes in the manufacture of nonwovens
- To acquire knowledge on the different methods of finishing nonwoven products
- To understand the various applications of nonwovens

Course Outcomes (COs)

1. Explain the nonwoven manufacturing processes using natural and chemical fibres
2. Differentiate different bonding methods used in nonwoven manufacturing process
3. Suggest suitable finishing methods of nonwoven meant for different applications.
4. Evaluate the nonwovens in terms of physical properties
5. Outline the applications of nonwovens for hygiene and household products.

CO No.	Course Outcome	Level
CO1	Explain the nonwoven manufacturing processes using natural and chemical fibres.	Understand
CO2	Differentiate various bonding methods used in nonwoven manufacturing.	Analyze
CO3	Suggest suitable finishing techniques for nonwovens used in different applications.	Apply
CO4	Evaluate nonwoven fabrics in terms of physical properties.	Evaluate
CO5	Outline the applications of nonwovens in hygiene and household product sectors.	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**M**			
CO3	**S**	**S**	**M**		
CO4	**M**	**S**	**S**		
CO5	**S**				**M**

UNIT I WEB FORMATION

Definition of Nonwoven - nonwoven manufacturing processes - nonwoven properties and applications including environmental considerations. Raw materials for the production of nonwoven: natural fibers -animal fibres -chemical fibres. Web forming - Lay process - spun laying. Spun bonding web Formation.

UNIT II BONDING

Needling: principle - needle characteristics - process variables- fabric properties. Loop formation

processes: types - Process variables -fabric properties. Hydro-entanglement process: principle -process variables -Fabric properties. Bonding: Hot air - Heat setting - Thermal calendar-ultrasound - Chemical - saturation - print. Foam and spray bonding.

UNIT III FINISHING

Mechanical finishing: splitting and winding - perforating -drying - compressive finishes, Surface finishes: singeing - shearing - flocking - raising - polishing -softening, Wet finishes: washing -colouration -printing - Application of chemical finishes: types - antistatic agents - antimicrobial or biocidal finishes -flameproof finishes - waterproof finishes - softeners-stiffeners. UV stabilisers.

UNIT IV TESTING

Sampling and statistics - Testing conditions -Standards and specifications. Testing of raw materials - finished fabrics. Testing process related to end use: hygiene and medical products – household textiles. Protective clothing and filter fabrics.

UNIT V APPLICATIONS

Hygiene - medical-safety -cleaning - household products - home textiles - apparels - technical. Reutilization of nonwovens - recycling of nonwovens. Techno economic in nonwovens.

Reference(s)

1. Albrecht W, 'Nonwoven Fabrics', WILEY-VCH Verlag GmbH & Company, Germany, 2003.
2. Russell S, 'Handbook of Nonwovens', The Textile Institute Publication, 2007.
3. Irsak O, 'Nonwoven Textiles', Textile Institute, Manchester, 1999
4. Krcma R, 'Manual of Nonwovens', Textile Trade Press, Manchester, 1993.

25BSTT34 - TECHNICAL TEXTILES – I

COURSE OBJECTIVES

- To inculcate the knowledge of textile materials in various technical areas.
- To learn about technical textiles, and its applications in different field knowledge.

COURSE OUTCOMES

Upon successful completion of this course the student would be able to,

- Identify the various technical textiles used in the day to day life
- Visualize the usage of various fibres for specific application

CO No.	Course Outcome	Level
CO1	Identify the various technical textiles used in daily life.	Understand
CO2	Visualize the usage of different fibres for specific technical textile applications.	Understand
CO3	Classify technical textiles based on their end-use applications.	Understand
CO4	Interpret the relationship between fibre properties and their functional performance.	Analyze
CO5	Recommend suitable technical textiles for targeted industry or societal applications.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**M**			
CO3	**S**	**S**			
CO4	**S**	**S**	**M**		
CO5	**S**		**M**	**M**	

UNIT I

Technical Textiles: Definition – Classification – Market growth and potential - Future of Technical Textiles industry in India. Fibres used - Technical yarns: staple yarns, monofilament, multifilament yarns - Technical fabrics: woven, nonwoven, knitted. Technology of Specialty fabrics manufacturing: braided structures, Spacer fabrics, 3-D weaving. Application of Specialty fabrics

UNIT II

Coated Textile – Textile and Coating materials: Textile materials and fibers, their properties, woven, knitted, non-woven materials. Polymeric materials for coating and their properties like rubber (natural and synthetic), polyvinyl chloride, polyurethane, acrylic polymers. Applications of coated materials.

UNIT III

Textiles for filtration: Introduction, importance of filtration, Principles and mechanism of Filtration, requirements of filtration, Filtration Equipments, Textile in Dry Filtration, Textile in Liquid Filtration, Designing for Filtration, Testing and evaluation of performance. Application and developments in filtration fabrics.

UNIT IV

Textiles in Agriculture, Electronics. Textiles for Banners and Flags. Textile Reinforced Products, Transport Bags and Sheets, Pack-tech related applications, Fabrics to Control Oil Spills, Canvas Covers and Tarpaulins, Ropes and Nets, Home and Office Furnishings, Testing and evaluation techniques of all these products

UNIT V

Smart and Intelligent Textiles: Active, passive and very smart textiles - Phase change materials - shape memory polymers - chromic and conductive Materials - applications in various fields.

TEXT BOOKS:

1. Sabit A, 'Handbook of Industrial Textiles', Wellington Sears, Rouledge, 2017.
2. Horrocks A. R & Anand S. C, 'Handbook of Technical Textiles', Woodhead Publishing and The Textile Institute, Cambridge, England, 2000.
3. Hearle J.W.S, 'High Performance Fibers', WoodHead Publishing Limited, Cambridge, England, 2001.

REFERENCES:

1. Senthilkumar R, 'Textiles for Industrial Applications', 1st Edition, CRC Press, 2013.
2. Kothari V.K, 'Recent advances in technical textiles',-Indian journal of fiber and textile research
3. Johnson, J. S. and Mansdorf, S. Z, 'Performance of Protective clothing', 5th Volume, USA: ASTM Publication, 1996.

25BSTT36L – NON-WOVEN AND BONDED FABRICS LABORATORY

Course Objectives

- Interpret the property of the technical fabrics and requirements of the product in the area of application
- Design the process to impart the necessary performance on the textile substrate
- Perform function assessment testing on the imparted performance and access the level of performance.

Course Outcomes (COs)

1. Select appropriate fabrics for any certain application
2. Select necessary chemical for imparting performance on the fabric
3. Access and analyze the performance of the finished fabric and improvise the performance as per requirement

CO No.	Course Outcome	Level
CO1	Select appropriate fabrics for specific applications.	Apply
CO2	Select suitable chemicals to impart functional finishes to fabrics.	Apply
CO3	Assess the performance of finished fabrics based on functional properties.	Evaluate
CO4	Analyze test results to determine the effectiveness of fabric finishes.	Analyze
CO5	Improvise the performance of finished fabrics based on analysis and application needs.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**S**			
CO2	**S**	**S**			
CO3	**S**	**S**	**M**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**	**M**	

List of Experiments: (Any 10 experiments)

1. Preparatory line for Nonwoven manufacturing/ Preparation of Web Using Carding/ Opening Machine
2. Identification of Parts and Working of a Needle Punching Machine
3. Preparation of Fibre Reinforced Polymer Composite
4. Study of Materials Used in Sanitary Pad Manufacturing

5. Thermal bonding
6. Hydroentanglement
7. Ultrasonic bonding
8. Chemical bonding
9. Narrow fabric manufacturing
10. Anti-Static finishing
11. Insect repellent finishing
12. UV protection finishing

25BSTT37L – MODERN KNITTING LABORATORY

Course Objectives

- To study the various knitting machines and differentiate them.
- To develop a knitted fabric based on their application

Course Outcomes

Upon successful completion of this course the student would be able to,

- Experiment with the various machine parameters for creating a fabric for a specified end use Identify the given knitted fabric

CO No.	Course Outcome	Level
CO1	Experiment with various machine parameters to produce fabrics for specific end-use applications.	Apply
CO2	Identify the structure and type of given knitted fabrics.	Remember
CO3	Analyze the relationship between machine settings and fabric properties.	Analyze
CO4	Evaluate the quality of produced knitted fabric.	Evaluate
CO5	Modify process parameters to optimize knitted fabric production.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**S**			
CO2	**S**				
CO3	**S**	**S**	**M**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**	**M**	

LIST OF EXPERIMENTS:

1. Study of Single jersey knitting machine.
2. Study of Interlock knitting machine
3. Study of Rib knitting machine
4. Analysis of Single jersey knitted fabrics
5. Analysis of Interlock knitted fabrics
6. Analysis of Rib knitted fabrics
7. Analysis of Jacquard knitted fabrics
8. Analysis of commercial knitted fabrics collected from industry (Two Samples).

REFERENCES:

1. Anbumani N, "Knitting-Fundamentals, Machines, Structures and Developments", New Age International (P) Ltd., New Delhi, 2007.
2. Spencer D J, "Knitting Technology", Textile Institute Publication, Manchester, UK, 3rd Edition, 2001

25BSTT38L – FABRIC MANUFACTURIGN LABORATORY

Course Objectives

- To study the operating mechanism of the weaving machine
- To study the woven fabric structures and its derivatives.

Course Outcomes

Upon successful completion of this course the student would be able to,

- Understand the yarn passage in weaving machine
- Design the weave patterns
- Identify design draft and peg plan

CO No.	Course Outcome	Level
CO1	Understand the yarn passage through the weaving machine.	Understand
CO2	Design basic and complex weave patterns.	Create
CO3	Identify the drafting and lifting plans related to weave designs.	Remember
CO4	Interpret design drafts and peg plans for loom setup.	Analyze
CO5	Apply drafting and lifting plans to develop woven fabric structures.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**S**			
CO2	**S**				
CO3	**S**	**S**	**M**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**	**M**	

LIST OF EXPERIMENTS

1. Study of material passage in loom
2. Study of negative shedding mechanism in loom: Tappet/Climax
3. Study of picking and beat up mechanism in power loom
4. Study of let-off and take up mechanism in loom
5. Study of single cylinder single lift jacquard mechanism in loom
6. Study the passage of material in braiding machine

REFERENCES:

1. Anbumani N, “Knitting-Fundamentals, Machines, Structures and Developments”, New Age International (P) Ltd., New Delhi, 2007.
2. Spencer D J, “Knitting Technology”, Textile Institute Publication, Manchester, UK,

3rd Edition, 2001
3. Grosicki, Z. J., Watson‟s Textile Design and Colour-elementary Weaves and Figured Fabrics. 7th Edition. Woodhead Publishing Ltd, England, 2004.
4. Talukdar, M. K, An Introduction to Winding and Warping. Textile Trade Press Mumbai, 1982.

25BSUG39I – INTERNSHIP – I

Course Objectives

- To expose the students in the real time world
- To gain knowledge on the process, machinery and technology

Course Outcomes

After successful completion of this course, the students should be able to

- Identify the solution for industry related problems
- Understand the suitable process, machinery and technology for product manufacturing
- Summarize the results and submit a report.

Pre-requisites:

Students will undergo internship training in an established organization of Textile for a period of 4 weeks.

- At the end of internship training, students will submit a report of training undertaken.
- The student has to present their report to the Panel of members for evaluation.

SEMESTER IV

25BSTT41 - TEXTILE CHEMICAL PROCESSING

Course Objectives

- To understand the preparation of fibre, yarn and fabric for dyeing and machinery required.
- To understand the concept of colouration and processes involved in the colouration of textile materials.
- To understand printing and finishing of textile materials.
- To analyze the design, constructional and operational features of textile Printing and finishing machinery.

Course Outcomes (COs)

1. Suggest process, process parameters and methods different textile material
2. Develop recipe, choose dyes and evaluate fastness properties
3. Select methods, styles of printing and printing ingredients to carry out printing of textile materials
4. Appraise an effluent treatment plant.

CO No.	Course Outcome	Level
CO1	Suggest processes, process parameters, and methods for different textile materials.	Apply
CO2	Develop recipes, choose dyes, and evaluate fastness properties.	Create
CO3	Select methods, styles, and ingredients for printing textile materials.	Apply
CO4	Evaluate printed samples based on quality and fastness standards.	Evaluate
CO5	Appraise the structure and effectiveness of an effluent treatment plant used in textile processing.	Evaluate

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**S**	**M**		
CO2	**S**	**M**	**S**		
CO3	**S**	**S**	**M**		
CO4		**M**	**S**		
CO5		**S**	**S**		**M**

UNIT I PREPARATORY IN WET PROCESSING

Wet process sequences for cotton (knitted & woven), wool, silk and blended fabrics. Singeing: Desizing:. Scouring: Saponification - emulsification - detergency - Scouring of cotton. Wool: scouring, Crabbing, Milling and carbonization - Silk: Degumming. Scouring of

synthetic materials and blends. Features and working principles of - kier. Physical and chemical methods of assessing scoured fabrics - Measurement of residual impurities.

UNIT II BLEACHING AND MERCERIZING

Bleaching: Reactions of hypochlorite - hydrogen peroxide - sodium chlorite. Continuous scouring and bleaching process. Combined scouring and Bleaching. Bleaching of blends - Physical and chemical evaluation of bleached materials. Mercerization: Principles and methods - effects of process conditions on structure and properties. Mercerization of cotton / viscose blends. Mercerizing machines - Assessment of mercerized samples. Liquid ammonia treatment.

UNIT III DYEING

Dyes - properties - Auxochrome, chromophore and common dye structure - dye-fibre interactions -Substantivity - Affinity - Adsorption - Mechanism and Application: Direct, Reactive,Acid, Basic, Vat, Disperse, Sulphur, Azoic and Metal complex dyes. Dyeing of PET, Nylon, Acrylic, cellulose, Triacetate and protein fibres. Dyeing of blends.

Wet Processing Machines: Construction (schematic diagram) and working of loose stock, hank and package processing machines - J-box - jigger - winch - jet and soft-over-flow machines - continuous dyeing ranges.

UNIT IV PRINTING METHODS

Hand, block, screen, roller, rotary, inkjet, digital, Transfer, garment printing. Drawback and advantages. Photoelectric method of screen preparation. Styles of Printing: Direct, Discharge and Resist Styles. Printing Ingredients: Printing paste- properties and requirements. After Treatment: Steamers - Agers - Curing process. Printing of Cellulose Fabrics: Direct, Reactive, Vat, Azoic and Sulphur Dyes and Pigments Printing of Wool/Silk Fabrics: Acid, Basic and Reactive Dyes.Printing of Synthetics: Disperse Dyes, Acid Dyes and Pigments

UNIT V EFFLUENT TREATMENT

Suitable solutions for sustainable wet processing, Textile Effluent: Characteristics, BOD, COD, TDS and pH. Textile Effluent Treatment: Primary, Secondary Tertiary Membrane technology. Zero Discharge. Effluent (discharge) and environment compliance: BIS and other international standards like ISO, DIN.

Reference(s)

1. Karmakar S R, ‘Chemical Technology in the Pre-Treatment Processes of Textiles’, Elsevier, 1999
2. Trotman E R, ‘Dyeing and Chemical Technology of Textile Fibers’, B.I.Publishing pvt ltd, New Delhi 1994.
3. Kaushik C V, ‘Chemical Processing of Textiles’, NCUTE, 2004.
4. Shenai V A, ‘Technology of Bleaching and Mercerization’, Sevak Publication, Bombay, 1996.

5. Sule A D, ‘Computer Colour Analysis’, New Age International Publishers, 1997.
6. Shenai V A, ‘Evaluation of Textile Chemicals’, Sevak publications, Mumbai, 1995.
7. Schindler W D and Hauser P J, ‘Chemical Finishing of Textiles’, Woodhead Publishing Limited, 2004.
8. Shenai V A, ‘Technology of Printing’, Vol. IV, Sevak Publication, Bombay, 1996.
9. Vankar P, ‘Textile Effluent’, NCUTE Publication, New Delhi, 2002
10. Leslie Miles W C, ‘Textile Printing’, Society of Dyers and Colourists, 2003.
11. Bhagwat R S, ‘Hand book of Textile Processing Machinery’, 2003.

25BSTT42 – TECHNICAL FABRIC STRUCTURE

Course Objective

To enable the students to learn the

- About different structures of woven fabric and design the structure for different applications

Course Outcomes

Upon the completion of this course the student will be able to construct design, draft and peg plan and loom requirements for producing fabrics with

- Plain, twill, satin and derivatives structures
- Honey comb, crepe structures
- Bedford cords, piques, backed fabrics, extra warp/weft figuring
- Warp and weft pile structures
- Double, damask, gauze and leno structures

CO No.	Course Outcome	Level
CO1	Understand the construction and characteristics of plain, twill, satin and their derivatives.	Understand
CO2	Analyze the structural differences in honeycomb and crepe weave designs.	Analyze
CO3	Identify and explain Bedford cords, piques, backed fabrics, and extra warp/weft designs.	Understand
CO4	Understand the formation of warp and weft pile structures.	Understand
CO5	Compare and differentiate double cloth, damask, gauze, and leno fabric structures.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**		**M**		
CO2	**S**	**M**	**S**		
CO3	**S**		**M**		
CO4	**M**		**S**		
CO5	**S**	**S**	**S**		

UNIT I

Introduction – methods of representing weave in point paper, construction of design, draft and lifting plan, types of draft, heald calculation, order of denting; elementary weaves – plain, twill, satin, sateen and their derivatives – loom requirements

UNIT II

Ordinary and brighten honey comb; huck-a-back and its modifications; mock Leno; crepe weaves; colour theory – light and pigment theory; modification of colour; colour and weave effects; loom requirements

UNIT III

Bedford cords - plain and twill faced, wadded; welts and piques, wadded piques; backed fabrics warp and weft, reversible and non-reversible fabrics; extra warp and extra weft figuring – single and double colour – loom requirements

UNIT IV

Pile fabrics; warp pile - wire pile, terry pile, loose backed; weft pile – plain back and twill back velveteen, lashed pile, corduroy, and weft plush – loom requirements, Double cloth, types of stitches; Damasks; Gauze and Leno principles – loom requirements; trade name of popular structures

UNIT V

Weft knit Stitches: Knit, purl, tuck, and float. Weft knit structures and derivatives: Single jersey, rib, interlock, la coste, cross tuck, satin, knit twill, honeycomb, popcorn, jersey blister, French terry, thick fleece, ribbed effect, and seer sucker, plush.

Warp knit Stitches: Overlap, under lap, open stitch, closed stitch. Warp knit structures and derivatives: pillar, inlay, blind, atlas, twill, and full tricot, lock knit, satin, reverse lock knit, shark skin, queen's cord.

TEXT BOOKS:

- Grosicki Z. J., "Watson's Textile Design and Colour", Vol.1, Wood head Publications, Cambridge England, 2004, ISBN: 1 85573 7701 24.
- Grosicki Z. J., "Watson's Advanced Textile Design and Colour", Vol. II, Butterworths, London, 1989, ISBN-9781855739963

REFERENCES:

- Wilson J, "Handbook of Textile Design", Textile Institute, Manchester, 2001, ISBN: 185573 5733.
- Horne C.E, "Geometric Symmetry in Patterns and Tilings", Textile Institute, Manchester, 2000, ISBN: 1 85573 4923.
- Seyam A. M, "Structural Design of Woven Fabrics, Theory and Practice", Textile Institute, Manchester, 2002, ISBN: 1 87037 2395.
- Georner D, "Woven Structure and Design, part 1: Single Cloth Construction", WIRA, U.K., 1986, ISBN: 0900820179 | ISBN-13: 9780900820175
- Georner D, "Woven Structure and Design, Part 2: Compound Structures", WIRA, U.K., 1989, ISBN: 090366951X | ISBN-13: 9780903669511
- Shenton J, "Woven Textile Design", Laurence King Publishing, 2014, ISBN: 178067337X | ISBN-13: 9781780673370.

25BSTT43 - TECHNICAL TEXTILE – II

Course Objectives

- To inculcate the knowledge of textile materials in various technical areas.
- To learn about technical textiles, and its applications in different field.

Course Outcomes

Upon successful completion of this course the student would be able to,

- Identify the various technical textiles used in the day to day life
- Visualize the usage of various fibres for specific application

CO No.	Course Outcome	Level
CO1	Identify the various technical textiles used in day-to-day life.	Remember
CO2	Classify technical textiles based on their functional application.	Understand
CO3	Visualize the usage of various fibres for specific technical textile applications.	Apply
CO4	Relate fibre properties to the performance of technical textile products.	Analyze
CO5	Evaluate the suitability of technical textiles for different industries.	Evaluate

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				
CO2	**S**	**M**			
CO3	**S**	**S**	**M**		
CO4	**M**	**S**	**S**		
CO5		**M**	**S**		**S**

Unit 1

Medical Textiles- products, properties and fiber used: Non-implantable materials, extra-corporeal devices, implantable materials, healthcare and hygiene products. Fibres used in medical textiles.

Unit 2

Industrial Textile: Fibres used - functions and properties - introduction to coated fabrics - Coating methods: Direct and indirect - Lamination methods: Flame bonding and adhesive lamination - Applications of coating and laminated textiles

Unit 3

Textiles for Construction: Importance of buildtech with respect to technical textiles, Requirements of buildtech, study of structure and properties of high performance textile structures in relation to requirements of buildtech. Applications like Fabrics for Architecture and Construction, Applications of Coated Fabrics in Building Structures, Awnings and Canopies, Textiles as Roofing Materials, Storage Vessels, Fibre Reinforced Concrete and Cements, Textiles for Acoustic and heat Insulation

Unit 4

Textiles in transportation: Introduction - Raw material selection – properties – classification - applications - Manufacturing process - structure and properties: Tyre cord fabrics, Airbags, Seat Belts, Automotive Interior Trim, Automotive Exterior Trim ,Truck and Car Covers, Hoses and Filters in Cars. Textile for Aircrafts, Textiles as structural Elements in Transport Vehicles, Inflatable Products Used in Transportation. Testing and evaluation techniques of above products.

Unit 5

Protective Textiles: Materials used – properties – Manufacturing techniques - applications: Fire Protective clothing, Heat resistant garments, Water proof materials, Ballistic resistant Vests, Biological and chemical Protective clothing.

REFERENCE BOOKS:

1) Adanur S, 'Handbook of Industrial Textiles', Wellington Sears.
2) Horrocks A.R, 'Handbook of Technical Textiles', Woodhead Publishing.
3) Wilusz E, 'Military Textiles'.
4) Fung W, & Hardcastle M, 'Textiles in Automotive Engineering'.
5) Scott R A, 'Textiles for Protection'.
6) Mallick P K, 'Fibre-Reinforced Composites'.
7) Miravate A, '3-D Textile Reinforcements in composite materials'.
8) Sen A K, 'Coated Textiles Principles and Applications'
9) Jinlian H U, 'Shape memory polymers and Textiles'.
10) Brown P J, & Stevens K, 'Nanofibres & Nanotechnology in Textiles'.

25BSTT44 - GARMENT MANUFACTURING TECHNOLOGY

Course Objectives

- To upgrade the knowledge in the field of garment design & development
- To study the various stages involved in the production of garments

Course Outcomes

Upon successful completion of this course the student would be able to,

- Identify the various types of sewing machine
- Differentiate the various stages of garment production

CO No.	Course Outcome	Level
CO1	Identify the various types of sewing machines used in the garment industry.	Remember
CO2	Explain the functions and parts of basic and advanced sewing machines.	Understand
CO3	Differentiate the various stages involved in garment production.	Analyze
CO4	Classify the types of stitches and seams used in different garment construction stages.	Understand
CO5	Choose appropriate machines and methods for different garment components.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				
CO2	**S**	**M**			
CO3	**M**	**S**	**S**		
CO4	**M**		**S**		
CO5	**S**	**M**	**M**		

Unit – 1: Apparel Industry: Introduction, Organization and Overview. Anthropometric measurements: vertical, horizontal and circumference. Pattern making tools & equipments. Grain lines**:** study of grain lines in fabrics and patterns, Types: lengthwise, widthwise, bias and selvedges.

Unit – 2: Spreading: Types of lay - single ply, multiply, stepped ply - Forms of Spreading: One way, face to face, two way - Spreading methods: manual spreading, Spreading carriage,

automatic spreading machine. Layout: Principles, laying of different patterns on different types of fabric. Grading – Definition, principles, types and Importance.

Unit – 3: Marker making: Types of marker making, types of lay plan, marker efficiency, Position marking, drill marker, notches, thread marker, Fusing machines & their applications.

Unit – 4: Sewing machine: Types – Manual, Semi-automatic and Automatic - function and major components – application - care and maintenance**.** Stitches: Introduction, types, diagrams and steps of stitch formation. Sewing machine needles: Types – straight and curved - needle points - size - uses.

Unit- 5: Operation and application: over-lock, flat-lock, double needle lock stitch, double needle chain stitch, button hole, button attach, bar-tack, zig-zag, feed off the arm sewing machines

References:

1. Chuter A.J, "Introduction to clothing production management".
2. Clair S, 'Sewing for Apparel Industry', Prentice Hall, New Jersey 2001.
3. Bheda R, 'Managing Productivity in the Apparel Industry', CBS Publishers & Distributors (2006).
4. Armstrong H J, "Pattern Making for Fashion Design", Dorling Kindersley India Pvt. Ltd. (2009)
5. Mathews M, "Practical clothing construction" Thomson & co., madras, 1974.
6. Solinger J, "Apparel Manufacturing Handbook", Van Nostrand Reinhold Company (1980).
7. Carr H and Iatham B, "The technology of clothing manufacture", Om book service 1994.

25BSTT46 - ENVIRONMENTAL STUDIES

Course Objectives

- To enable the students to understand the different types of pollution and its impact on environment
- To create awareness among the students about eco-systems, social issues and environmental pollution control legislations

Course Outcomes

Upon successful completion of this course the student would be able to,

- Elaborate on the various natural resources
- Identify the various forms of pollution
- Know various social issues

CO No.	Course Outcome	Level
CO1	Elaborate on the various natural resources and their importance.	Remember
CO2	Identify the various types and sources of pollution.	Understand
CO3	Explain the impact of environmental degradation on society and ecosystems.	Analyze
CO4	Recognize the significance of conservation and sustainability practices.	Understand
CO5	Know and discuss various social issues related to environment and health.	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		**M**	**S**		
CO2		**S**	**S**		
CO3		**S**	**M**		
CO4		**S**	**M**		**S**
CO5			**M**		**S**

UNIT I

Natural Resources: Renewable and non-renewable resources - natural resources and associated problems - forest resources - water resources - mineral resources - food resources - energy resources - land resources - role of an individual in conservation of natural resources - equitable use of resources for sustainable lifestyles.

UNIT II

Ecosystems: Concept of 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.

UNIT III

Environmental Pollution: Meaning and factors, types of environment pollution: air pollution, water pollution, noise pollution, industrial pollution - soil pollution - marine pollution - thermal pollution - nuclear hazards - role of an individual in prevention of pollution.

UNIT IV

Social issues: from unsustainable to sustainable development - urban problems related to energy - water conservation, rain water harvesting, watershed management - resettlement and rehabilitation of people; its problems and concerns - environmental ethics : issues and possible solutions - climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

UNIT V

Environment Protection act: Environment protection act - air (prevention and control of pollution) act - water (prevention and control of pollution) act - wildlife protection act - forest conservation act - issues involved in enforcement of environmental legislation - public awareness.

TEXTBOOKS:

1. Benny Joseph, „Environmental Science and Engineering", Tata McGraw-Hill, New Delhi, 2006.

2. Gilbert M.Masters, „Introduction to Environmental Engineering and Science", 2nd edition, Pearson Education, 2004.

REFERENCES:

1. Dharmendra S. S, 'Environmental law', Prentice hall of India Pvt Ltd, New Delhi, 2007.

2. Bharucha E, 'Textbook of Environmental Studies', Universities Press (I) Pvt, Ltd, Hyderabad, 2015.

3. Miller G T and Spoolman S E, 'Environmental Science', Cengage Learning India PVT, LTD, Delhi, 2014.

4. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, 2005.

25BSTT47L - FABRIC STRUCTURE ANALYSIS LABORATORY

Course Objectives

- To study the operating mechanism of the weaving machine
- To study the woven fabric structures and its derivatives.

Course Outcomes

Upon successful completion of this subject, the students should be able to:

- Understand the yarn passage in weaving machine
- Design the weave patterns
- Identify design draft and peg plan

CO No.	Course Outcome	Level
CO1	Understand the yarn passage in weaving machine.	Understand
CO2	Identify the key components involved in the yarn passage process.	Remember
CO3	Design various weave patterns for fabric construction.	Create
CO4	Identify and interpret the design draft and peg plan.	Analyze
CO5	Apply knowledge to plan basic woven fabric structures.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**M**			
CO3	**S**	**S**	**M**		
CO4	**M**	**S**	**S**		
CO5	**M**	**S**	**M**		

LIST OF EXPERIMENTS

1. Study of material passage in loom
2. Study the passage of material in braiding machine
3. Analysis of woven designs: Plain and its derivatives
4. Analysis of woven designs: Twill and its derivatives
5. Analysis of woven designs: Satin / Sateen
6. Analysis of huck-a-back / honeycomb weaves
7. Analysis of mock-leno / crepe weaves
8. Analysis of extra warp / extra weft figurine
9. Analysis of double fabric
10. Analysis of Pile fabric

REFERENCES:

1. Grosicki, Z. J, 'Watson's Textile Design and Colour-elementary Weaves and Figured Fabrics', 7th Edition, Woodhead Publishing Ltd., England, 2004.
2. Talukdar, M. K, 'An Introduction to Winding and Warping'. Textile Trade Press, Mumbai, 1982.

25BSTT48L - TEXTILE CHEMICAL PROCESSING LABORATORY

Course Objectives

- To acquire the skills in preparation for textile materials. To evaluate the properties of pretreated materials and the strength of chemicals used in the pre-treatment.

Course Outcomes (COs)

- Select process parameters for desizing, scouring and carry out in laboratory scale
- Choose process parameters and carry out bleaching and mercerization of given samples
- Develop dye recipes and new print patterns

CO No.	Course Outcome	Level
CO1	Select process parameters for desizing, scouring, and carry out in laboratory scale.	Apply
CO2	Choose process parameters for bleaching and mercerization of given samples.	Apply
CO3	Perform the bleaching and mercerization processes on textile materials.	Apply
CO4	Develop dye recipes suitable for different types of fabrics.	Create
CO5	Design and develop new print patterns for textile applications	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**S**	**M**		
CO2	**S**	**S**	**M**		
CO3	**S**	**S**	**M**		
CO4	**S**	**M**	**S**		
CO5	**S**	**M**	**S**	**M**	

List of Experiments:

1. Hydrolytic desizing, scouring of grey cotton and assessment of the desized and scoured samples.
2. Comparison of hydrogen peroxide and sodium hypochlorite bleached samples for whiteness
3. Comparison of dyed properties on cotton with direct dye and reactive dye (hot and cold brand dye)
4. Dyeing of wool/silk with acid and basic dyes
5. Dyeing of polyester with disperse dyes (HTHP)

6. Direct style of printing on cotton fabric using direct dyes and reactive dyes.
7. Printing of white and colour khadi paste/Pigment.
8. Tie and Dye
9. White and colour discharge print on reactive dyed cotton fabric
10. Printing of blended fabrics using direct, pigment and burnout methods

Reference(s)

1. Karmakar S R, 'Chemical Technology in the Pre-Treatment Processes of Textiles', Elsevier, 1999
2. Trotman E R, 'Dyeing and Chemical Technology of Textile Fibers', B.I.Publishing pvt ltd, New Delhi 1994.
3. Kaushik C V, 'Chemical Processing of Textiles', NCUTE, 2004.
4. Shenai V A, 'Technology of Bleaching and Mercerisation', Sevak Publication, Bombay, 1996.
5. Sule A D, 'Computer Colour Analysis', New age international publishers, 1997.
6. Shenai V A, 'Evaluation of Textile Chemicals', Sevak publications, Mumbai, 1995.
7. Schindler W D and Hauser P J, 'Chemical Finishing of Textiles', Woodhead Publishing Limited, 2004.
8. Shenai V A, 'Technology of Printing', Vol. IV, Sevak Publication, Bombay, 1996.
9. Vankar P, 'Textile Effluent', NCUTE Publication, New Delhi, 2002
10. Leslie Miles W C, 'Textile Printing', Society of Dyers and Colourists, 2003.
11. Bhagwat R S, 'Hand book of Textile Processing Machinery', 2003.

25BSTT49L - GARMENT MANUFACTURING LABORATORY

Course Objectives

- Prepare samples for various types of stitches.
- Prepare samples for fullness, plackets, zippers, collars, pockets, sleeves and yokes.

Course Outcomes

Upon successful completion of this course the student would be able to,

- Identify and explain the parts and functions of a sewing machine.
- Prepare various samples for stitching.
- Categorize various attachments for enhancing the garment value.

CO No.	Course Outcome	Level
CO1	Identify and explain the parts and functions of a sewing machine.	Understand
CO2	Operate the sewing machine for basic garment construction.	Apply
CO3	Prepare various samples for stitching techniques.	Apply
CO4	Categorize and choose appropriate attachments to enhance garment value.	Analyze
CO5	Demonstrate the usage of attachments for aesthetic or functional enhancement.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**S**			
CO3	**S**	**S**	**M**		
CO4	**S**	**M**	**S**		
CO5	**S**	**M**	**S**	**M**	

LIST OF EXPERIMENTS:

1. Study on parts and functions of sewing machine, overlock machine, Flat lock machine
2. Measuring the form – Male, female and child.
3. Drafting the basic pattern set of bodice and sleeve using the standard measurements.
4. Drafting the basic pattern of skirt and trouser using the standard measurements.
5. Prepare samples for seams and seam finishes
   A) **Seams**: plain, single top stitch, double top stitch, welt, lapped, slot, flat fell, french, hemmed flat fell, mantua maker‟s and piped seam.

B) **Seam Finishes**: pinked, double stitch, edge stitch, herring bone, bound seam edge finish and overcast finish.

6. Preparation of samples for **Fullness** (darts, tucks, pleats, flares, godets, gathers and shirrs, frills and ruffles).
7. Prepare samples of collars – Peter Pan collar, shirt collar and stand collar
8. Prepare samples of pockets – Patch, set in seam and set in slot
9. Prepare samples of sleeves – Plain, puff, raglon and kimono
10. Prepare samples of yokes – Partial yoke, yoke with fullness

REFERENCES:

1. Mathews M, 'Practical clothing construction Part -I Basic Sewing Processes'.
2. Mathews M, 'Practical clothing construction Part-II Designing, Drafting and Tailoring'.
3. Zarapkar K R 'System of Cutting', Navneet Publications,2011.
4. Laing R M and Webster J 'Stitches & Seams', The Textile Institute, 1998.
5. Claire B. Shaeffer. 'Sewing for the Apparel Industry'. Vol. 978. 2nd Edition. Pearson Publishers, 2012.
6. Cooklin G, Hayes S G, McLoughlin J, Fairclough D, 'Cooklin's Garment Technology for Fashion Designers', John Wiley & Sons, 2012.
7. Knight L, '200 Sewing Tips, Techniques and Trade Secrets', Griffin: St. Martin"s Press, 2010.
8. Besty H, 'The Complete Book of Sewing', Dorling Kindersley Ltd., London, 2006.

SEMESTER V

25BSTT51 - HIGH PERFORMANCE FIBRES

Objectives & Outcome:

- To provide the knowledge about modern functional fibre and its commercial application
- To provide the knowledge about the characteristics and production methods of high performance fibers.

CO No.	Course Outcome	Level
CO1	Understand the types and characteristics of modern functional fibres	Understand
CO2	Identify and classify various high-performance fibres used in industry.	Understand
CO3	Explain the commercial applications of functional fibres.	Understand
CO4	Compare different production methods of high-performance fibres.	Analyze
CO5	Evaluate the suitability of functional fibres for specific technical applications.	Evaluate

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**		**M**		
CO2	**S**	**M**	**M**		
CO3	**S**	**S**	**M**		
CO4	**M**	**S**	**S**		
CO5	**M**	**S**	**S**		**M**

UNIT - 1

Introduction to high performance fibre – growth patterns – major attributes- advantages- product development areas; Aramids- fibre formation – structure-properties- performance – applications

UNIT - 2

Carbon fibre – introduction – classification – types- manufacturing process – PAN – rayon – Mesophase Pitch – structure – properties- application – new developments; Glass fibres – introduction – fibre types – compositions- manufacturing process – fibre structure-properties-application an dnew developments

UNIT - 3

Polyethylene fibres – introduction – fibre formation – structure –properties-applications and new developments; Ceramic fibres –classification – fibre formation – composite – structure - properties-applications and new developments

UNIT - 4

Chemically resistant fibres –introduction – chlorinated fibres –PVDC- Flourinated fibres – PTFE –PVF –PVDF – FEP: Thermally resistant fibres –Introduction – thermosets –aromatic polyamides and polyamides – semi-carbon fibres – oxidized acrylics.

UNIT - 5

Other fibres – Introduction- PBZT and PBO – Quartz – Copolymer Polyester Vectra-Vectran – Poly(p-xylene) – miscellaneous.

References:

1. Mukhopadhay S.K, High –Performance fibres, Textile Institute Vol.25,
2. Hearle J.W.S, 'High –Performance fibres', Woodhead publishing, 2001.

25BSTT52 – FUNCTIONAL FINISHING OF TEXTILE MATERIAL

Course Objectives

- To understand the advancements in the finishing process of textile materials.
- To evaluate the alternative processes in preparation and finishing
- To acquire knowledge on the science and technology of coating and lamination of textile materials.
- To understand the applications of coated and laminated textiles.

Course Outcomes (COs)

1. Suggest recipes for textile materials for different finishing and employing latest developments.
2. Evaluate the concepts involved in textile finishes.
3. Appraise textile fibres, structures and parameters for coating applications.
4. Select appropriate polymers, resins and suitable methods and machines for coating applications.
5. Characterize coated and laminated textile materials.

CO No.	Course Outcome	Level
CO1	Suggest recipes for textile materials for different finishing and employing latest developments.	Create
CO2	Evaluate the concepts involved in textile finishes.	Evaluate
CO3	Appraise textile fibres, structures and parameters for coating applications.	Evaluate
CO4	Select appropriate polymers, resins, and suitable methods and machines for coating applications.	Apply
CO5	Characterize coated and laminated textile materials.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**S**	**M**		
CO2	**M**		**S**		
CO3	**S**	**M**	**S**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**		**M**

UNIT I FINISHING

Mechanical and Chemical Finishing - Durable and non-durable finishes - Heat setting (stenter) - Calendaring - Sanforising. Application of chemical finishes: padding- low wet pick up methods (foaming, spraying) - coating and laminating. Drying (cylinder, loop, tumble).

UNIT II FUNCTIONAL FINISHES

Flame retardant finish: Mechanism - Assessment methods of FR finish. Water repellent and water proof finishes: Wetting- Contact angle - assessment methods. Soil release finish: mechanism - Evaluation of soil release. Wash and wear finish: mechanism - cross linking

agents (formaldehyde and non-formaldehyde)- assessment methods. Mechanism and chemistry: Antistatic finish - UV Protection finish -Antimicrobial finish - Anti odour finish - enzymatic treatment (bio-polishing).

UNIT III ADVANCED FINISHES

Micro and Nano encapsulation and its application in finishing of textile materials - Finishing of Technical textiles - Formaldehyde-free crease recovery finishing. Problems and remedies in the flame retardant finishing of polyester and its blends. Bio-polishing - Influence of bio-polishing on dyeability and physical properties of fibres and fabrics - developments of new fibres using Bio technology.

UNIT IV COATING AND LAMINATION MATERIALS & METHODS

Commercial and technical scope of coated and laminated textiles. Materials for coating: Plastic materials -natural and synthetic rubbers, Polyvinyl Chloride, Acrylic polymers. Materials for lamination: Films - polyurethane foam -polyolefin foam.

Adhesives: solvent-based and water-based. Textile Substrate: Requirements of textile substrates for coating, Selection of textile fibres and fabric structure.

Coating and Lamination Methods: Calendaring coating - Knife coating - Roller coating - Nip and Dip coating - Spray coating - Foam coating - Powder coating-Slot die extruder-Flame lamination – Hot melt lamination.

UNIT V PRODUCTS

Protective Clothing - the spacesuit - garment interlinings - Tarpaulins - Conveyor belts - PTFE coated belts - Hot air balloons - Exhibition board coverings - Labels -Tyres and hoses - applications: Automotive - Marine - Buildings and architecture -Household products.

Adhesion test -Flexing Test -Abrasion resistance - Fabric handle, drape and stiffness - Fabric strength - Bursting strength - Dimensional stability - Thermal comfort -Flammability testing.

Reference(s)

1. Fung W, ‘Coated and Laminated Textiles’, Woodhead Publishing, England, 2002.
2. Sen A K, ‘Coated Textiles, Principles and Applications’, Technomic Publication, Lancaster, 2001.
3. Anand S. C. and Horrocks W, ‘Technical Textiles’, Woodhead limited, Cambridge England, 2000.
4. Lenk R. S., ‘Polymer Rheology’, Applied Science Publishers, London, 2000.
5. Smith W. C, ‘Smart Textile Coatings and Laminates’, Woodhead Publishing, Cambridge England, 2010.
6. Harrison P. W, ‘Low-Liquor Dyeing and Finishing’, Textile Progress, UK, 1986.
7. Chavan R B, ‘Environmental Issues: Technology Options for Textile Industry’, Special Issue,
   Indian Journal of Fibre and Textile Research, New Delhi, 2001.
8. Paulo A C, Enzymes in Textile Processing, Woodhead Publication, UK, 2002.

25BSTT53 - TECHNICAL TEXTILES – III

COURSE OBJECTIVES

- To inculcate the knowledge of textile materials in various technical areas.
- To learn about technical textiles, and its applications in different field knowledge.

COURSE OUTCOMES

Upon successful completion of this course the student would be able to,

- Identify the various technical textiles used in the day to day life
- Visualize the usage of various fibres for specific application

CO No.	Course Outcome	Level
CO1	Identify the various technical textiles used in day-to-day life	Remember
CO2	Visualize the usage of various fibres for specific applications	Understand
CO3	Categorize technical textiles based on their area of application	Analyze
CO4	Explain the functional properties of selected technical textiles	Understand
CO5	Suggest suitable fibres and structures for functional textile applications	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**		**M**		
CO2	**S**	**M**			
CO3	**S**	**s**	**M**		
CO4	**M**		**S**		
CO5	**S**	**S**	**S**	**M**	**M**

Unit 1

Home textiles - Materials used – properties – Manufacturing techniques – products and applications – quality Requirements

Unit 2

Sports textiles – **:** Products - Materials used – Manufacturing techniques - properties – testing methods and application.- Active and Passive, electronic integrated sport textiles

Unit 3

Textiles for military and defense: Introduction, Applications of various textile structure in protective Clothing and Individual Equipment, Textiles Used in Defense Systems and Weapons, Testing and evaluation of various textile structures used in defense and military applications.

Unit 4

Geo-Textiles: Products - Materials used – Manufacturing techniques - properties – testing methods and application.

Agro Textiles: Products - Materials used – Manufacturing techniques - properties – classification and applications.

Unit 5

Oeko -Textiles: Products - Materials used – Manufacturing techniques - properties – applications.

Technical textiles for clothing application: Products - Materials used – Manufacturing techniques - properties –applications.

Textiles for packing application: Products - Materials used – Manufacturing techniques - properties –applications.

TEXT BOOKS:

1. Sabit A, 'Handbook of Industrial Textiles', Wellington Sears, Rouledge, 2017.
2. Horrocks A. R, & Anand S. C, 'Handbook of Technical Textiles' Woodhead Publishing and The Textile Institute, Cambridge, England, 2000
3. Hearle J.W.S, 'High Performance Fibers', WoodHead Publishing limited, Cambridge, England, 2001.

REFERENCES:

1. Kumar S R, 'Textiles for Industrial Applications', 1st Edition. CRC Press, 2013.
2. Kothari V K, 'Recent advances in technical textiles',Indian journal of fiber and textile research
3. Johnson J S and Mansdorf S Z, 'Performance of Protective clothing', 5th Volume. ASTM Publication, USA, 1996.

25BSTT56 - QUALITY EVALUATION FOR TECHNICAL TEXTILE

Course Objective

To enable the students to know about the properties to be tested in each stage of the product and acceptance level of the product quality.

Course Outcomes

i. Acquisition of knowledge in basic working principles of testing instruments
ii. Skill sets in preparing samples for various types of experiments and to conduct experiments.
iii. Ability to analyze and interpret the data obtained from the testing instruments
iv. Arrive at conclusions on quality based on the standards and present the results

CO No.	Course Outcome	Level
CO1	Acquire knowledge of basic working principles of textile testing instruments	Remember
CO2	Prepare samples for experiments and perform various textile testing procedures	Understand
CO3	Analyze and interpret data obtained from testing instruments	Analyze
CO4	Evaluate the quality of textiles based on standard test results	Understand
CO5	Present results effectively and draw meaningful conclusions from data	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**	**M**	**S**		
CO2	**S**				
CO3			**S**		**M**
CO4		**S**	**S**		
CO5		**M**	**S**		**S**

UNIT 1

Introduction - Textile testing - On-line and off-line testing techniques - Sampling techniques - Statistical techniques for fibre, yarns and fabrics - Test of significance - T and F test – Quality control charts for variables and attributes – Acceptance sampling – AQL – Humidity, standard RH and temperature for testing and mechanical processing - Measurement of moisture.

UNIT 2

Fibre Testing - Length characteristics - Bare sorter, digital fibrograph, HVI - Trash content determination - Trash analyser, trash and quality of yarn - Fibre fineness - Importance, fineness testers – Maturity - Importance, methods - Nep measurement - Fibre strength - Principle of measurements, importance, bundle and single fibre strength testers - Advance fibre information systems(AFIS)*.

UNIT 3

Yarn testing - Twist testers - Tension type, take-up twist testers, electronic twist tester - Yarn strength - Single thread strength testers, lea strength tester - Lea CSP - Yarn evenness - Definition - Classification of variation, methods of measuring evenness Yarn fault classifications – Classimat - Yarn appearance - Yarn hairiness measurement*.

UNIT 4

Fabric Testing - Crimp - Crimp tester - Fabric tensile strength testers - Ballistic tester, hydraulic bursting strength tester - Fabric abrasion resistance, fabric pilling - Drape – Drape meter - Stiffness - Stiffness tester - Crease resistance and crease recovery measurements - Permeability - Air permeability tester, water permeability tester - Objective evaluation of fabric handle - Fabric specification* - Cloth defects - Four point system - Shrinkage potential – Colour fastness testing.

UNIT 5

Garment testing- **S**eam strength, seam slippage, garment checking procedure, interlining - peel bond strength - Trims specification - Stitch specification - Size scale – Garment dimensions and tolerances - Quality of trims and accessories - Defects in garments and their remedies - A, B and C zones in a garment with respect to defects*.

REFERENCES

1. Booth J E, “Principles of Textile Testing”, Butterworth., London, 2002
2. Saville B P, “Physical Testing of Textiles”, Textile Institute, Manchester, 1998.
3. Kothari V K., “Testing and Quality Management”, IAFL Publication, New Delhi 1999.
4. Mehta P V, “Managing Quality in the Apparel Industry”, NIFT Publication, India, 1998.
5. Kadolph S J, “Quality Assurance for Textiles and Apparels”, Fair Child Publications, New York, 1998.

Self-study topics

25BSTT57L - TEXTILE QUALITY EVALUATION LABORATORY

Course Objectives

- Draw representative samples, perform testing of fibres, yarns and fabrics
- Interpret the results obtained for process control and product certification
- Perform experiments to improvise on applications; design or modify simple instruments; make use of advanced statistical techniques

Course Outcomes (COs)

1. Draw representative samples, perform testing of fibres, yarns and fabrics
2. Interpret the results obtained for process control and product certification
3. Perform experiments to improvise on applications; design or modify simple instruments; make use of advanced statistical techniques

CO No.	Course Outcome	Level
CO1	Draw representative samples of fibres, yarns, and fabrics for testing using standard sampling techniques.	Understand
CO2	Perform laboratory tests to determine the physical, chemical, and mechanical properties of textile materials.	Apply
CO3	Interpret test results to ensure process control, maintain quality standards, and support product certification.	Analyze
CO4	Conduct experiments to explore and enhance the applications of textile materials and processes.	Evaluate
CO5	Design or modify simple instruments and apply advanced statistical tools for analysis, optimization, and innovation.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**	**M**	**S**		
CO2	**S**	**S**	**S**		
CO3	**M**	**S**	**S**		**M**
CO4	**S**	**S**	**S**		
CO5	**S**	**S**	**S**		**S**

List of Experiments:

1. Measurement of Fibre length by Baer Sorter and Digital Fibro graph
2. Measurement of Fibre fineness and bundle strength testing by Stelo meter
3. Measurement of linear density of sliver, roving, and yarn and moisture regain of fibre sample.

4. Single and ply yarn twist measurement
5. Measurement of Single Thread Strength, Lea Strength and Impact strength of yarn and fabric
6. Measurement of Yarn evenness and imperfections and assessment using yarn appearance board
7. Measurement of Drape Coefficient of fabrics with different areal densities
8. Measurement of Fabric thickness, stiffness and crease recovery
9. Fabric tensile strength (Strip test and Grab test) and tear strength
10. Assessment of Fabric abrasion resistance and fabric pilling
11. Measurement of Fabric Air Permeability and bursting strength

25BSTT58L - TECHNICAL TEXTILES PRODUCT LABORATORY

Course Objectives

To identify and analyze the various technical textile products that are used commercially

Course Outcomes

Upon successful completion of this subject, the students should be able to:

- Identify the technical textile product and differentiate its category and application
- To identify the fibers /materials used and the manufacturing techniques
- To determine the properties and functions of the product

CO No.	Course Outcome	Level
CO1	Identify technical textile products used in various sectors.	Understand
CO2	Differentiate technical textiles based on their category and application areas.	Apply
CO3	Identify the types of fibres and materials used in the production of technical textiles.	Analyze
CO4	Recognize the manufacturing techniques applied in producing specific technical textile products.	Evaluate
CO5	Determine the functional properties and performance characteristics of technical textile products.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**			
CO2	**S**	**M**			
CO3	**S**	**M**			
CO4	**M**	**S**	**S**		
CO5	**M**	**S**	**S**		**M**

LIST OF EXPERIMENTS

1. Fabrication of Composites using Hand Lay-up and Compression Moulding.
2. Development and Characterization of Bio-Based Fibre Reinforced Polymer Composites using Novel Natural Fibers.
3. Production of Nonwoven Fabric Using Needle Punching Machine
4. Sanitary Pad Production Using Semi-Automated Machinery
5. Measurement of Absorbency Rate, Total Absorption Capacity, Wicking and Retention Capacity Test
6. Reverse engineering of technical products across any 5 different categories.,
   a) Agrotech
   b) Buildtech
   c) Clothtech
   d) Geotech
   e) Hometech
   f) Indutech

g) Meditech
h) Mobiltech
i) Oekotech
j) Packtech
k) Protech
l) Sportech

REFERENCES:

1. Sabit A, 'Handbook of Industrial Textiles', Wellington Sears, Rouledge, 2017.
2. Horrocks A. R. & Anand S. C, 'Handbook of Technical Textiles', Woodhead Publishing and The Textile Institute, Cambridge, England, 2000.
3. Hearle J W S, 'High Performance Fibers', Wood Head Publishing limited, Cambridge, England, 2001.

25BSUG59I – INTERNSHIP – II

Course Objectives

- To expose the students in the real time world
- To gain knowledge on the process, machinery and technology

Course Outcomes

After successful completion of this course, the students should be able to

- Identify the solution for industry related problems
- Understand the suitable process, machinery and technology for product manufacturing
- Summarize the results and submit a report.

Pre-requisites:

Students will undergo internship training in an established organization of Textile for a period of 4 weeks.

- At the end of internship training, students will submit a report of training undertaken.
- The student has to present their report to the Panel of members for evaluation.

SEMESTER VI

25BSTT61 - COSTING AND EX-IM MANAGEMENT

Course objectives

- To enable the students to learn about preparation of cost sheet, costing of yarn, fabric and garments.

Course Outcomes

Upon successful completion of this course the student would be able to

- Understand fundamentals of costing and construct cost sheet
- Understand the concepts of cost profit volume and even break analysis and method of standard costing
- Determine cost of yarn, fabric and garment
- Understand the foreign exchange mechanism and management of working capital
- Understand the concepts of preparation of budget

CO No.	Course Outcome	Level
CO1	Understand the fundamentals of costing and prepare a detailed cost sheet	Understand
CO2	Explain cost-profit-volume relationships, break-even analysis, and methods of standard costing.	Apply
CO3	Determine and analyze the cost of yarn, fabric, and garment production.	Analyze
CO4	Understand the basics of foreign exchange mechanisms and working capital management.	Understand
CO5	Explain the process of budgeting and develop simple budget plans.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**	**M**	**S**		
CO2	**S**	**M**	**S**		
CO3	**S**	**S**			
CO4		**M**	**M**	**S**	
CO5	**M**	**M**	**M**	**S**	**M**

UNIT I

Cost accounting, elements of cost, classification of cost elements – examples from textile industry, methods of costing; cost sheet preparation

UNIT II

Cost profit volume analysis, breakeven analysis; standard costing, analysis of variance

UNIT III

Costing of yarn – material, labour, power and overhead expenses, allocation of overhead costs; costing of fabric; costing of garment

UNIT IV

Foreign exchange mechanisms, exchange rates; foreign exchange exposure management – risks, strategies to reduce risk; working capital management.

UNIT V

Budget, types of budgets, budgeting and control in textile industry.

TEXT BOOKS:

1. ThukaramRao M E, "Cost and Management Accounting" New Age International, Bangalore, 2004, ISBN: 812241513X / ISBN: 978-8122415131.
2. ThukaramRao M E, "Cost Accounting and Financial Management" New Age International, Bangalore, 2004, ISBN: 8122415148/ ISBN: 978-8122415148.

REFERENCES

1. Bhave B V, and Srinivasan V, "Cost Accounting to Textile Mills", ATIRA, Ahmadabad, 1974.
2. Kantwala D N, "Costing and Cost Control – A Marginal Approach for Textile Industry", Texcons, Bombay, 1977.
3. James C and Van H, "Financial Management and Policy", Prentice Hall of India Pvt.Ltd, New Delhi, 2001, ISBN: 0130326577 | ISBN-13: 9780130326

25BSTT62 - ENTREPRENEURSHIP DEVELOPMENT

Course Objectives

- To create awareness and enhance skills in identifying opportunities, develop ideas and start business ventures.
- To emphasizes on entrepreneurial process.

Course Outcomes

Upon successful completion of this course the student would be able to,

- Gain knowledge on textile entrepreneurship.
- Understand the barriers of starting a small business.
- Learn the process of managing small and medium business

CO No.	Course Outcome	Level
CO1	Gain knowledge on textile entrepreneurship and its scope in the industry.	Understand
CO2	Identify the characteristics and skills required to become a successful textile entrepreneur.	Apply
CO3	Analyze the common barriers and challenges faced while starting a small business.	Analyze
CO4	Learn and apply the process of managing small and medium textile enterprises.	Understand
CO5	Understand the importance of planning, funding, and marketing strategies in entrepreneurial setup.	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**M**			**S**	
CO2				**S**	**M**
CO3			**M**	**S**	
CO4	**M**	**M**	**S**	**S**	
CO5		**M**	**S**	**S**	

UNIT I

Entrepreneurship: Internal and external factors, functions of an entrepreneur, entrepreneurial motivation and barriers, classification of entrepreneurship, theory of entrepreneurship, concept of entrepreneurship, development of entrepreneurship; culture, stages in entrepreneurial process.

UNIT II

Business plan development: Creativity and entrepreneurial plan - Idea generation, screening and project identification, creative performance, feasibility analysis: Economic, marketing, financial and technical - Project planning - Evaluation, monitoring and control segmentation - Creative problem solving - Heuristics, brainstorming, value analysis and innovation.

UNIT III

Institutional support for new ventures - Supporting Organizations: Incentives and facilities: Financial institutions and small-scale industries, Government Policies for SSIs, Angel investors, and private equity.

UNIT IV

Family and non-family entrepreneur - Role of professionals, professionalism v/s family entrepreneurs, role of woman entrepreneur - Venture capital - Nature and overview, venture capital process, locating venture capitalists.

UNIT V

Role of support institutions and management of small business - Director of industries - DIC, SIDCO, SIDBI, TIIC, MSME small industries, development corporation (SIDC), SISI, NSIC, NISBUED, SFC-Unicorn startups.

TEXT BOOKS:

1. Charantimath P M, "Entrepreneurship Development and Small Business Enterprise", Pearson Education India, Noida, 2011 & 2014
2. Holt, "Entrepreneurship: New Venture Creation", Prentice-Hall Inc., USA, 1998.

REFERENCES:

1. Bridge S & O'Neill K, "Understanding Enterprise: Entrepreneurship and Small Business", Palgrave Macmillan, London, 4th Edition, 2012.
2. Dollinger M J, "Entrepreneurship", Prentice Hall Inc., USA, 1999.

SEMESTER VII
25BSTT71 - RESEARCH METHODOLOGY

Course Objectives

To enable impactful business research that is accepted by National and International Journals.

Course Outcomes

Upon successful completion of this course the student would be able to,

CO No.	Course Outcome	Level
CO1	Understand the fundamentals of research, including its scope, significance, types, and ethical considerations.	Understand
CO2	Determine measurement techniques, scaling, sampling, data collection, and processing of data for business research.	Apply
CO3	Conduct statistical tests, interpretation of results, report writing, and effective presentation of research findings.	Evaluate

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		**M**			
CO2				**S**	
CO3			**M**		

UNIT I

Research - Scope and significance - Types of research - Research process – Characteristics of good research – Research design- Ethics in business research*.

UNIT II

Measurement - Errors in measurement* - Tests of sound measurement, techniques of measurement - Scaling Techniques - Types of scales - Scale construction.

UNIT III

Sampling design – Criteria for good sample design* - Types of sample designs - Probability and non-probability samples - Data collection: Types of data - Sources – Tools for data collection - methods of data collection - Constructing questionnaire - Pilot study* - Case study* - Data processing: Coding - Editing and tabulation of data.

UNIT IV

Test of Significance: -Assumptions about parametric and non-parametric tests. Parametric test – t test, F test and Z test - Non-Parametric Test -U Test, Kruskal Wallis, sign test – non-parametric test – Chi square and ANOVA.

UNIT V

Interpretation - Techniques of interpretation - Report writing: Significance – Report writing: Steps in report writing - Layout of report - Types of reports - Oral presentation - Executive summary - mechanics of writing research report - Precautions for writing report - *Norms for using tables, charts and diagrams – Appendix: Norms for using index and bibliography.

TEXT BOOKS:

1. Zukmund, G. William., Barry Babin., & Jon Carr. (2012). Business Research Methods (9th ed.). Cengage Learning.
2. Cooper,R. Donald., & Pamela, S. Schindler. (2014). Business Research Methods (12th ed.). McGraw Hill Education.
3. Collis Jill., & Hussey. (2013). Business Research: A Practical Guide for Undergraduate and Post Education (4th ed.). Palgrave Macmillan.

25BSTT72 – INDUSTRIAL MANAGEMENT

Course Objectives

- To acquaint the students with the basic nature of management, its process, tasks and responsibilities of a manager
- To introduce the basics of managerial functions like human resources, marketing, finance and production

Course Outcome

Upon successful completion of this course the student would be able to,

- Elaborate on the HRM policies in an organization
- Provide examples on marketing using case studies
- Point out the functions of HR, Marketing, Finance and Production departments in an organization

CO No.	Course Outcome	Level
CO1	Elaborate on key Human Resource Management (HRM) policies followed in organizations.	Understand
CO2	Analyze case studies to illustrate effective marketing strategies.	Analyze
CO3	Identify the major functions of HR, Marketing, Finance, and Production departments in an organization.	Understand
CO4	Compare and contrast the interrelationship between different functional departments.	Analyze
CO5	Apply basic management principles to real-time business scenarios.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1				**S**	**S**
CO2	**S**	**M**		**S**	
CO3	**M**	**M**	**S**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**	**S**	

UNIT I

Management: Science, theory and practice - the evolution of management thoughts - management as art - management as profession - professionalization of management in India - functions of management - levels of management - case analysis.

UNIT II

Human Resource Management: Introduction - HRM policies and roles - The importance of the human factor - HRM and its interaction with other functional areas - line and staff functions - role of HR manager - case analysis.

UNIT III

Marketing: Concept of marketing and marketing management, marketing as a business process - marketing environment, marketing mix - relationship of marketing department with production, finance, purchase and human resource department - demand and market - concepts of consumer marketing, industrial marketing and services marketing – marketing research, demand and supply – price determination - case analysis.

UNIT IV

Finance: Introduction: Financial, management and cost accounting - accounting concepts and conventions - concept of finance and functions of financial management; objectives of the firm; time value of memory and risk - return relationship - case analysis.

UNIT V

Production: Production planning and control: production systems, types of production, re-planning and control functions, relations with other departments, efficiency of production planning and control – scheduling – GANTT charts - case analysis.

TEXT BOOKS:

1. Tripathi P C & Reddy P N, 'Principles of Management' ,5th Edition, JBA publishers, New Delhi, (2013).
2. Rao V S P, 'Human Resource Management: Text & Cases', 1stEdition, Excel Books, New Delhi, (2000),.
3. Pandey I M, 'Financial Management', 10thEdition, Vikas Publishing House P. Ltd., Noida, (2010).

REFERENCES:

1. Chandrabose D, 'Principles of Management and Administration', 2nd Edition, PHI Learning Pvt. Ltd., New Delhi, (2012).
2. Kotler P, Koshy K & Jha, 'Marketing Management', 14th Edition, Pearson Education / Prentice Hall of India, New Delhi, (2011).
3. Pannerselvam R, 'Production and Operations Management'. 2nd Edition, Prentice Hall of India, New Delhi, (2008).

25BSTT73 - NEW PRODUCT DEVELOPMENT & ASSESSMENT

Course Objectives

- To comprehend nuances of new product development and factors influencing it.
- To develop alternate products with reduced cost of development

Course Outcomes

Upon successful completion of this course the student would be able to,

CO No.	Course Outcome	Level
CO1	Developing of alternate products with reduced time for development.	Create
CO2	Comprehend fibre properties and relating with specific product requirements.	Understand
CO3	Analyze and Develop yarn to meet specific requirement of new product or modify yarn properties to enhance functional performance.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		S			
CO2	S				
CO3					S

UNIT I

Introduction to new product development - factors to be considered in new product development. Deriving aesthetic and functional requirements of new product from customer needs.

UNIT II

Understanding properties of natural and synthetic fibres, Evaluation of fibre properties and relating product requirements. Application of fibres for various uses and assessment for compliance. Selection and Assessment of fibre properties for specific end use. Development and Documentation of new product from fibres.

UNIT III

Types of yarns - properties - manufacturing method - development of new product or modify existing product to meet current market requirements. Selection and assessment of yarn properties for specific end use. Development and Documentation of new product from fibres.

UNIT IV

Types of fabrics - properties - manufacturing method - knitted and woven fabrics - finishing process for various applications. Selection of appropriate fabric and assessment of fabric properties for specific end use. Development and Documentation of new product from knitted and woven fabrics.

UNIT V

Strategies to develop alternate product or modify existing product to meet customer needs, reduce development cost and time.

TEXT BOOKS:

1. The Technology of Short Staple Spinning by W. Klein
2. Principles of Textile Testing by J. E. Booth, 1961, Heywood Books, London.
3. Knitting Technology: D. Spencer; Published by Pergammon Press

Course Objectives

- The objective is to make students understand the importance of medical textiles in today's market.
- This course will encourage the students to choose medical textiles as a career option by enhancing their knowledge in production, technology, regulative and commercial aspects of medical textiles.

Course outcomes

Upon successful completion of this subject, the students should be able to:

i. Learn about the various applications of textiles in medical field as medical textiles

ii. Learn about product innovation, marketing, regulation and quality testing criteria involved in medical textiles.

iii. Gain skills to start an entrepreneurial career in medical textiles, which is a quick expanding industrial sector.

CO No.	Course Outcome	Level
CO1	Learn about the various applications of textiles in medical field as medical textiles	Understand
CO2	Learn about product innovation, marketing, regulation and quality testing criteria involved in medical textiles.	Understand
CO3	Gain skills to start an entrepreneurial career in medical textiles, which is a quick expanding industrial sector.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	M		M	S
CO2	M	S	S	M	M
CO3	S	M	M	M	S

UNIT I:

Implantable Medical Textiles, Non – Implantable Materials, Extra Corporal Devices, Health Care/ Hygiene Products, Fibres in Medical Field, Requirements of Medical Textiles.

UNIT II:

Developments in suture, dressing materials, super absorbable polymer, spider silk, science of medical textiles: surface modification - surface coating, plasma treatment. Textile finishing for medical application: antibacterial finishing, anti-odour finishing, blood coagulant finishing, blood anticoagulant finishing, drug delivery applications, water and blood absorption finishing, blood repellent finishing, medical compression textiles, protective/barrier products, medical textiles in orthopedics, medical textiles in prosthetics.

UNIT III:
Various stages in new product development - Strategies for product development - Define the product - Identify market needs - Regulation of medical devices – Quality system requirements - Testing standards requirement for medical textile products and compliance.

UNIT IV:
Medical Textile Production cum Process Technology and Management - Fabric Forming - Composite formation, Clean technique, sterile technique, Disposable; reusable textiles, Critical vs. non-critical application.

UNIT V:
Medical Textile Marketing – Trade and Management - Application insights, Medical textiles market share, Market analysis according to the application, Market segmentation, Med-tex market in India and foreign countries, Growth drivers, Market access, Rural market, Marketing research, Market analysis, opportunities in medical textiles, Challenges for medical textile business.

REFERENCES:

1. Horrocks A R & Anand S C. (2016). Handbook of Technical Textiles (2 nd ed). Woodhead Publishing.
2. 2. Adanur S, Wellington Sears. (1995). Handbook of Industrial Textiles (1 st ed). Technomic Publishing.
3. Mukhopadhyay S. K. (1993). High Performance Fibres. Textile Progress. Textile Institute. Vol.25, No.3/4.
4. Hearle J W S. (2001). High Performance Fibres. Woodhead Publishing.
5. Study material – SVPISTM Short term course on Medical Textile Management

***Self-study topics**

25BSTT75 - TEXTILE REINFORCED COMPOSITES

OBJECTIVES

To enable the students to learn about

- Reinforcements, matrices used for the composites
- Manufacture and testing of composites and
- Mechanics of failure of composites

OUTCOME

Upon completion of this course, the student shall be able to

- Select different types of textile reinforcements and matrices used for the manufacture of composites and their behaviours
- Evaluate the characteristics of composites

CO No.	Course Outcome	Level
CO1	Identify various types of textile reinforcements and matrices used in composite manufacturing.	Understand
CO2	Describe the role of fibre orientation, volume fraction, and interface in composite performance.	Apply
CO3	Select appropriate textile structures for specific composite applications.	Analyze
CO4	Analyze the mechanical and thermal behavior of textile composites.	Evaluate
CO5	Evaluate the overall characteristics and performance of composite materials.	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**		**M**		
CO3	**S**	**S**	**S**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**		**M**

UNIT I REINFORCEMENTS

Manufacturing, properties and applications of Glass, Quartz, Boron, Silicon carbide, Carbon, HPPE and Aramid fibers.

UNIT II MATRICES

Preparation, Chemistry, Properties and applications of thermoplastic and thermoset resins- Unsaturated Polyester, Vinyl Ester, Epoxy, Phenolics, polyimides, polyurethanes, polyamides, Polypropylene, PEEK and Polycorbanate

UNIT III COMPOSITE MANUFACTURING

Composites manufacturing for both thermoplastics and thermosets- Hand layup, Filament Winding, Resin transfer moulding, prepregs and autoclave moulding, pultrusion, vaccum impregnation methods, compression moulding; post processing of composites and Composite design requirements

UNIT IV TESTING

Fibre volume and weight fraction, specific gravity of composites, tensile, flexural, impact, compression, interlaminar shear stress and fatigue properties of thermoset and thermoplastic composites

UNIT V MECHANICS

Micro mechanics, macro mechanics of single layer, macro mechanics of laminate, classical lamination theory, failure theories and interlaminar stresses

REFERENCES

1. Schwartz M M, "Composite Materials", Vol. 1 & 2, Prentice - Hall PTR, New Jersey, 1997.
2. Jang B Z, "Advanced Polymer composites", ASM International, USA, 1994.
3. Carlsson L A and Pipes R B, "Experimental Characterization of advanced composite Materials", Second Edition, CRC Press, New Jersey, 1996.
4. Lubin G and Peters S T, "Handbook of Composites", Springer Publications, 1998.
5. Christensen R, "Mechanics of composite materials", Dover

25BSTT76 – PROTECTIVE TEXTILE

Course Objectives

- Study the development and evaluation of ballistic fabrics, including multi-layered structures and enhanced performance.
- Explore conductive textiles and aerosol protection, focusing on conductive fabrics and filtration for chemical agents.
- Explore conductive textiles and aerosol protection, focusing on conductive fabrics and filtration for chemical agents.

Course Outcomes

Upon successful completion of this course the student would be able to,

CO No.	Course Outcome	Level
CO1	Evaluate the components and performance of ballistic fabrics to assess their suitability for protective applications.	Evaluate
CO2	Analyze the interactions between protection and thermal comfort to prioritize factors influencing the effectiveness of protective textiles.	Analyze
CO3	Create strategies for general protection requirements and applications to enhance the safety of various professional environments.	Create

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		S			
CO2	S				
CO3					S

UNIT I - BALLISTIC FABRICS

The Concept - The Components - Other Potential Applications – Development of a Computational Fluid Dynamics Model - Metallised Film for Heat Gathering 'Pads' - Geometry of Finned and Spiral Heat Exchangers-Yarn Gripping in Ballistic Fabrics - Multi-layered Fabrics with Inter-layer Connections - Angle- interlock Woven Fabrics - Evaluation of Ballistic Performance of Fabrics with Enhanced Yarn Gripping.

UNIT II - CONDUCTIVE TEXTILES AND AEROSOL PROTECTION

Electrically Conductive Textiles for Protection - Fabrics Coated with Inherently Conducting Polymers - Radar Barrier Fence - Piezo-resistive Fabrics for Pressure Sensors and Mapping - Electrostatic Dissipation/Discharge-Aerosol Materials – Aerosol Generation - Particle Measurement - The FIL-Tex Measurement System - The Testing of Chemical and Biological Agents - Filtration Efficiency Measurement.

UNIT III - INTELLIGENT TEXTILES AND SURFACE TREATMENTS FOR TEXTILES

Smart textiles, Applications of smart textiles for protective purposes, Sensor function, Data processing, Actuators, Energy, Communication, Thermal protection, Electric actuation, Types of surface treatments, Early treatments for protective textiles, Progression to modern treatments, Choice of treatments in relation to fibre and fabric types, Treatment process fundamentals, Treatment application systems, Brief overview of finishes for protection..

UNIT IV - INTERACTIONS BETWEEN PROTECTION AND THERMAL COMFORT

Introduction, Definition of comfort, Test methods for heat and moisture transfer, Measurement of thermal comfort with practice-related tests, Interactions between heat and mass transfer, Moisture storage and influences on protection, Thermal manikins, Measuring the insulation of protective clothing systems, Measuring the evaporative resistance of protective clothing systems, Ensemble data, Moving manikins, Manikin tests vs fabric tests, Using manikins under transient conditions

UNIT V - GENERAL PROTECTION REQUIREMENTS AND APPLICATIONS

Civilian protection and protection of industrial workers from chemicals, Textiles for UV protection, Textiles for protection against cold, Thermal (heat and fire) protection, Microorganism protection, Textiles for respiratory protection. Electrostatic protection, Ballistic protection, Military protection, Fire fighters protective clothing, Protection against knives and other weapons, Flight suits for military aviators, Protection for workers in the oil and gas industry, Motorcyclists.

TEXT BOOKS:

1. A.R. Horoocks & D. Price “Fire Retardant Materials” Woodhead Publishing Ltd., Cambridge, 2001

2. Sabit Adanur “Handbook of Industrial Textiles” Wellington Sears, New York ,1995, eBook ISBN9780203733905.

TEXT BOOKS:

1. Brian J McCarthy “Polymeric Protective Technical Textiles”, published by A Smithers Group Company, UK, 2013

2. K.R. Spurny in Aerosol Measurement: Principles, Techniques and Applications, 2nd Edition, Eds., P.A. Baron and K. Willeke, Wiley Inter Science, New York, NY, USA, 2001, p.1.

3. J. Hu in Structure and Mechanics of Woven Fabrics, Woodhead Publishing, Cambridge, UK, 2004.

4. A. Mauritz in Practical Basic Knowledge Regarding Aerosol Technology, PALAS GmbH, Karlsruhe, Germany, 2008.

5. BS ISO 16900-3, Respiratory Protective Devices - Methods of Test and Test Equipment – Part 3: Determination of Particle Filter Penetration, 2013.

6. Mastura Raheel., “Protective Clothing Systems and materials”, Marcel Dekker, Inc. NewYork. Basel. HongKong, ISBN: 0-8247-9118-5, 1994.
7. H.R. Mattila “Intelligent Textiles & Clothing”
8. R.A. Scott “Textiles for Protection” Woodhead Publishing Ltd,2005, ISBN: 9781855739215.

SEMESTER VIII

25BSTT81 - TOTAL QUALITY MANAGEMENT

Course Objectives

- To make the students understand the basic concepts of total quality management and appreciate its importance in today's business environment.
- To enable them to acquire required diagnostic skills and use various quality tools.
- To familiarize the students about the Quality Management System.

Course Outcomes

- Capable of applying TQM concepts for improving the quality of products and services.
- Use tools and techniques of TQM for continuous improvement in quality.
- Implement Quality Management System.

CO No.	Course Outcome	Level
CO1	Understand the principles and importance of Total Quality Management in the textile and service sectors.	Understand
CO2	Apply TQM concepts to improve the quality of textile products and services.	Apply
CO3	Use appropriate tools and techniques of TQM such as SPC, Pareto Analysis, and Fishbone Diagrams for quality control.	Analyze
CO4	Demonstrate continuous improvement practices like Kaizen, Six Sigma, and benchmarking.	Evaluate
CO5	Implement and manage Quality Management Systems (QMS) in accordance with industry standards (e.g., ISO).	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**	**S**	**S**		
CO3	**M**	**S**	**S**		
CO4	**M**	**S**	**S**		**M**
CO5	**M**	**S**	**S**		**S**

UNIT1 - Introduction

Introduction and basic concepts, Definition of quality, Dimensions of quality, Evolution of TQM, TQM frame work*, Cost of Quality.

UNIT 2 - TQM Implementation

Leadership for TQM, Deming's quality principle, TQM implementation, PDSA cycle, Quality Circles, Quality Council, Supplier Partnership*.

UNIT 3 - Process approach to TQM

Process approach*, Juran's Trilogy, Taguchi's loss function, Kaizen, Quality by design, 5S, *5M*.

UNIT 4 - Tools and Techniques

7 Old quality control tools,Total productive maintenance*, Failure mode and effect Analysis, POKAYOKE, Six Sigma **,**Toyota and Six Sigma.

UNIT 5 - Quality Management Systems: Management systems for TQM, ISO 9000 & 14000 Quality management systems, Auditing and certification Process*- Quality Awards.

REFERENCES

1. Dale H & Besterfield E, "Total Quality Management", New Delhi: Pearson Education, 2011.
2. Ramasamy S, "Total Quality Management", New Delhi: Tata McGraw Hill Publishing Co. Ltd, 2008.
3. Evans J R and Lindsay W M, "Quality control and Management", New Delhi: Cengage Learning first edition, 2010.
4. Date B G, Wiet T and Iwaarden J, "Management Quality", New Delhi: Wiley Publications, 2012.
5. Brue G, "Six Sigma for Managers", New Delhi: Tata McGraw Hill Publishing Co. Ltd, 2002.

25BSTT82 – NANO TEXTILE

Course Objectives

- Understand the basics of nanotechnology and nanotextiles.
- Explore nano fibres and electrospinning techniques.
- Evaluate nanocomposites, nano coatings, and surface modifications.

Course Outcomes

- Analyze the mechanical, chemical, and biological properties of nanotextiles using advanced testing methods to assess their durability and performance.

CO No.	Course Outcome	Level
CO1	Analyze the differences between nanotechnology and conventional technology to explain their applications and risks in nanotextiles.	Analyze
CO2	Apply electrospinning techniques and mathematical modeling to design and produce nano fibres and yarns for specific textile applications.	Apply
CO3	Evaluate the synthesis methods and applications of various nanocomposites to determine their structural and property benefits for different textile uses.	Evaluate
CO4	Create nano coatings for textiles that provide self-cleaning, waterrepellent, and other functional properties by applying different nanoparticles.	Create
CO5	Analyze the mechanical, chemical, and biological properties of nanotextiles using advanced testing methods to assess their durability and performance.	Analyze

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**	**S**	**S**		
CO3	**M**	**S**	**S**		
CO4	**M**	**S**	**S**		**M**
CO5	**M**	**S**	**S**		**S**

UNIT1 - BASICS OF NANO TECHNOLOGY

Nanotechnology vs conventional technology, Definition, Classification, Biomimetics in nanotextiles, Nano synthesis – Top-down and bottom-up approach Nano risks and Nano hazards, Policy and regulation, Nano label. Applications of nanotextiles. Nanostructures as catalysts.

UNIT 2 - NANO FIBRES

Electrospinning - Types of electrospinning, Mathematical Modelling for the electrospinning process. Polymers used, and parameters influencing electrospinning, Continuous yarn from electrospinning - Wet spinning, Template synthesis, Phase separation, Interfacial polymerization. Synthesis of Carbon Nanotube (CNT) fibres and yarns. Woven nano fabrics for vascular grafts.

UNIT 3 - NANO COMPOSITES

Polymer matrix nanocomposites, Carbon and graphene nanocomposites. Ceramic Matrix nanocomposites, Metal matrix nanocomposites– synthesis, types and applications. Structural and property analysis of different nanocomposites.

UNIT 4 - NANO COATINGS AND SURFACE MODIFICATIONS

Synthesis of nanoparticles – AgNP, ZnNP, TiO2NP, Activated Carbon Application of nanoparticles on textiles, Mechanism of application of nanoparticles on the textiles. Selfcleaning, water-repellent, flame retardant, antibacterial, anti-frictional property of nanocoated textiles.

UNIT 5 - EVALUATION OF NANOTEXTILES

Morphology study and fibre diameter analysis using Image J -X-Ray diffraction, Optical Spectroscopy, Porosity and pore size distribution. Surface area analysis (BET), Zeta potential, Mechanical and Chemical Properties. Durability, Biological analysis of nanotextiles.

REFERENCES

1. 1. Mishra, R., & Militky, J. “Nanotechnology in textiles: theory and application.” Woodhead Publishing. 2018

2.Goyal, R. K. “Nanomaterials and nanocomposites: synthesis, properties, characterization techniques, and applications”. CRC Press. 2017

REFERENCES

1. Miller, J. C., Serrato, R., Represas-Cardenas, J. M., & Kundahl, G. (2004). The handbook of nanotechnology: Business, policy, and intellectual property law. John Wiley & Sons.

2. Bandyopadhyay, A. K. “Nano materials”, New Age International,2008.

25BSTT83L - CREATIVITY AND INNOVATION LABORATORY

Course Objectives

- To understand the nuances involved in Creativity & Innovation.
- To get hands on experience in applying creativity in problem solving.

Course Outcomes

Upon successful completion of this course the student would be able to,

CO No.	Course Outcome	Level
CO1	Provides insights about approaches to creativity and innovation	Understand
CO2	Understanding of heuristic models and its applications	Understand
CO3	Enhances the knowledge of nature of creativity	Apply
CO4	Ability to apply creativity in problem solving	Skill
CO5	Knowledge about radical and disruptive models of innovation	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	M	S	S	
CO2	M	S	M	M	S
CO3	S	M	S		
CO4	S	M	S	S	M
CO5	M	S	M		S

UNIT I

Introduction - Need for Creative and innovative thinking for quality – Essential theory about directed creativity, Components of Creativity, Methodologies and approaches, individual and group creativity, Organizational role in creativity, types of innovation, barriers to innovation, innovation process, establishing criterion for assessment of creativity & innovation.

UNIT II

Mechanism of Thinking And Visualization - Definitions and theory of mechanisms of mind heuristics and models: attitudes, Approaches and Actions that support creative thinking - Advanced study of visual elements and principles- line, plane, shape, form, pattern, texture gradation, colour symmetry. Spatial relationships and compositions in 2- and 3-dimensional space - procedure for genuine graphical computer animation – Animation aerodynamics – virtual environments in scientific Visualization – Unifying principle of data management for scientific visualization – Visualization benchmarking.

UNIT III

Creativity - Nature of Creativity: Person, Process, Product and Environment, Methods and tools for Directed Creativity – Basic Principles – Tools that prepare the mind for creative thought – stimulation – Development and Actions: - Processes in creativity ICEDIP – Inspiration, Clarification, Distillation, Perspiration, Evaluation and Incubation – Creativity and Motivation The Bridge between man creativity and the rewards of innovativeness – Applying Directed Creativity.

UNIT IV

Creativity In Problem Solving - Generating and acquiring new ideas, product design, service design – case studies and hands-on exercises, stimulation tools and approaches, six thinking hats, lateral thinking – Individual activity, group activity, contextual influences. Assessing Your Personal Creativity and Ability to Innovate, Enhancing Your Creative and Innovative Abilities.

UNIT V

Innovation - radical vs evolutionary, – Introduction to TRIZ methodology of Inventive Problem Solving – the essential factors – Innovator's solution – creating and sustaining successful growth – Disruptive Innovation model – Segmentive Models – New market disruption -—Managing the Strategy Development Process – The Role of Senior Executive in Leading New Growth – Passing the Baton, Entrepreneurial Tools for Creativity and Innovation.

Note: Students will undergo the entire programme similar to a Seminar. It is an activity-based course. Students will undergo the programme with both theoretical and practical content. Each student will be required to come out with innovative products or services. This will be evaluated by the faculty member(s) handling the course and the consolidated marks can be taken as the final mark. No end semester examination is required for this course

REFERENCES:

1. Hurt Floyd. (1999). Rousing Creativity: Think New Now. Crisp Publications.
2. Geoffrey Petty. (2012). How to be better at Creativity. The Industrial Society. Vikas Publishing.
3. Clayton M. Christensen Michael E. Raynor. (2007). The Innovator's Solution. Harvard Business School Press Boston.
4. Semyon, D. Savransky. (2000). Engineering of Creativity – TRIZ (1 st Ed.). CRC Press New York.
5. CSG Krishnamacharyalu, Lalitha R. (2013). Innovation management. Himalaya Publishing House.

*Self-study topics

ELECTIVE COURSES (EC)

25BSTT35 (A) – CLOTHING COMFORT

Course Objectives

- Important characteristics of the fabric responsible for its comfort properties
- Different phenomena which take place in the fabric related to the comfort properties of the fabric

Course Outcome

Upon successful completion of this course the student would be able to understand,

- Criteria for comfort of fabrics
- Psychological and physiological comfort with respect to clothing
- Thermo physiological comfort requirements of human and the role of clothing.
- The behavior of different fabric in relation to heat and moisture transfer
- The low stress mechanical properties of fabric with respect to comfort to the wearer

CO No.	Course Outcome	Level
CO1	Understand the criteria and parameters that influence the comfort of fabrics.	Understand
CO2	Explain the concepts of psychological and physiological comfort in relation to clothing.	Apply
CO3	Describe thermo-physiological comfort requirements and analyze the role of clothing in maintaining comfort.	Analyze
CO4	Examine the behavior of various fabrics in terms of heat and moisture transfer.	Evaluate
CO5	Analyze low-stress mechanical properties of fabrics and their impact on wearer comfort.	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	PO1	PO2	PO3	PO4	PO5
CO1	S		M		
CO2	M		S		
CO3	S	M	S		
CO4	S	S	S		
CO5	S	S	S		M

Unit -1

Comfort – types and definition; human clothing system, comfort perception and preferences

Unit-2

Psychological comfort; neuro-physiological comfort-basis of sensory perceptions; measurement techniques - mechanical stimuli and thermal stimuli

Unit 3:

Thermo physiological comfort – thermoregulatory mechanisms of the human body, role of clothing on thermal regulations.

Unit-4

Heat and moisture transfer – moisture exchange, wearer's temperature regulations, effect of physical properties of fibres, behaviour of different types of fabrics,

Unit-5

Fabric tactile and mechanical properties - fabric prickliness, itchiness, stiffness, softness, smoothness, roughness, and scratchiness; predictability of clothing comfort performance

Text Books:

1. Behery H M, "Effect of Mechanical and Physical Properties on Fabric Hand", Wood head Publishing Ltd.,2005, ISBN: 1855739186 | ISBN-13: 9781855739185
2. Li Y., "The Science of Clothing Comfort", Textile Progress 31:1-2, Taylor and Francis, UK, 2001, ISBN: 1870372247 | ISBN-13: 9781870372244

Reference Books:

1. Laing R.M., and Sleivert G.G., "Clothing, Textile and Human Performance" Textile Progress 32:2, The Textile Institute, 2002, ISBN: 1870372514 | ISBN-13: 9781870372510.
2. Das A and Alagirusamy R, "Science in clothing comfort", Wood head Publishing India Pvt. Ltd., India, 2010, ISBN: 1845697898 | ISBN-13: 9781845697891
3. Song G, "Improving comfort in clothing", Wood head Publishing Ltd., UK, 2011, ISBN: 1845695399 | ISBN-13: 9781845695392
4. Ukponmwan J O , "The Thermal-insulation Properties of Fabrics", Textile Progress 24:4, 1-54, Taylor and Francis, UK, 1993, ISBN: 1870812654 | ISBN-13: 9781870812658

25BSTT35 (B) – COATED AND LAMINATED TEXTILE

Course Objectives

- To enable the students to understand need for coating of textiles, different methods of coating of textile fabrics

Course Outcome

Upon successful completion of this course the student would be able to understand,

- Polymers used for coating
- Rheology of coated polymers
- Methods of coating of textiles
- Application of coated fabrics
- Testing of coated fabrics

CO No.	Course Outcome	Level
CO1	Identify different types of polymers used for textile coating.	Understand
CO2	Explain the rheological behavior of coated polymers and its influence on application.	Understand
CO3	Describe the various methods used for textile coating.	Understand
CO4	Recognize diverse applications of coated fabrics across industries.	Apply
CO5	Demonstrate knowledge of testing procedures for coated textile products.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**	**M**	**M**		
CO3	**S**	**S**			
CO4	**M**	**S**	**S**		**S**
CO5	**S**	**S**	**S**		**S**

Unit -1

Rubber-natural and synthetic, polyvinyl chloride, polyurethanes, acrylic polymers; adhesive treatment, radiation-cured coatings; materials and trends; textile fibres-spinning, woven fabrics, knitted fabrics, nonwoven fabrics

Unit-2

Rheological behavior of fluids; rheology of plastisols; hydrodynamic analysis of coating; clothing comfort, impermeable coating, breathable fabrics

Unit 3:

Coating features, methods of coating- knife coating, roll coating, dip coating, transfer coating, rotary screen printing, calendaring, hot-melt coating; general characteristics- tensile strength, elongation, adhesion, tear resistance, weathering behaviour, microbiological degradation, yellowing.

Unit-4

Synthetic leather, architectural textiles, fluid containers, tarpaulins, automotive air bag fabrics, carpet backing; textile foam laminates for automotive interiors; flocking fabrics for chemical protection; thermochromic fabrics, temperature adaptable fabrics, camouflage nets metal and conducting polymer, coated fabrics

Unit-5

Test methods for coated fabric evaluation; environmental norms for the chemicals used in coating industry.

Text Books:

1. Fung. W., "Coated and Laminated Textiles", Wood head Publishing Limited., Cambridge., 2002., ISBN: 1 85573 576 8
2. Ghosh. S. K., "Functional Coatings", Wiley-VCH Verlag, GmbH & Co. KGaA, Weinheim, 2006, ISBN:3-527-31296-X

Reference Books:

1. Akovali G, Banerjee D, Sen A K, and Setua D K, "Advances In Polymer Coated Textiles", Smithers Rapra, 2012
2. Sen A K, "Coated Textiles: Principles and Application", Technomic Publication, U.S.A., 2007, ISBN: 1420053450 | ISBN-13: 9781420053456
3. Waters M J, "Laboratory Methods for Evaluating Protective Clothing System Against Chemical Agents", Report no. CRDC-SP 84010, CRDC, Aberdeen Proving Ground, MD, U.S.A, 1984

25BSTT45 (A) - SMART AND WEARABLE TEXTILES

Course Objectives

- To impart knowledge on Smart and sustainable textiles
- To know the technology behind smart textiles

Course Outcomes

Upon successful completion of this course the student would be able to,

- Appreciate the use of smart textiles
- Understand the properties of smart textiles.
- Gain knowledge on the importance of sustainability.

CO No.	Course Outcome	Level
CO1	Appreciate the significance and emerging applications of smart textiles in various fields.	Understand
CO2	Understand the different types and working principles of smart textiles.	Apply
CO3	Identify key functional properties of smart textiles like responsiveness, conductivity, and flexibility.	Analyze
CO4	Gain knowledge of sustainable practices in smart textile production and lifecycle.	Evaluate
CO5	Relate the role of smart textiles to environmental and economic sustainability.	Understand

	MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**	**M**			
CO3	**S**	**S**	**M**		
CO4	**M**	**S**			**S**
CO5	**M**	**S**	**S**		**S**

Unit -1

Smart technology for textiles and clothing – Introduction and Overview, development of smart technology for textiles and clothing – sensors/actuators, for signal transmission, processing and controls. Electrically active polymer materials – concepts of autonomic systems and materials, polymer materials as actuators or artificial muscle, peculiarity of polymer gel actuator, triggers for actuating polymer gels, electroactive polymer gels as artificial muscles, from electro-active polymer gel to electro-active elastomer with large deformation.

Unit-2

Introduction to phase change materials – Heat balance and thermo-physiological comfort, phase change technology, PCMs in textiles, textile treatment with PCM microcapsules, thermal performance, test methods, applications, future prospects of PCM in textiles and clothing. Intelligent textiles with PCMs – Basic information on PCMs, phase change properties of linear alkyl hydrocarbons, textiles containing PCM, Functions of Textile Structure with PCM.

Unit 3:

Mode of PCM performance in clothing, Manufacturing of textiles containing micro PCMs, Applications of textiles containing PCMs are Domestic textiles, Medical products, Automotive textiles, Air conditioning buildings with PCMs.

Unit-4

Embroidery and Smart textiles – Introduction, basics of embroidery technology – combined embroidery techniques. Embroidery machines, Embroidery for technical applications – tailored fibre placement, Embroidery technology used for medical textiles. Embroidered stamp – gag or innovation. Adaptive and responsive textile structures – Introduction, textiles and computing – the symbiotic relationship, the three dimensions of clothing and wearable information infrastructure, textiles and information processing, Georgia tech wearable motherboard,

Unit-5

Standards and test method for protective fabric performance - flame retardant finishes, liquid repellent finishes, antistatic, liquid repellent, antibacterial, UV protection, mite protection; manikinsthermal manikins, segmented thermal manikins; evaporative resistance measurement-moisture permeability index, skin model; concept of dynamic manikins; permeation resistance test-index of penetration and index of repellency; liquid tight integrity and gas tight integrity

Text Books:

1. Tao X, ‘Smart fibres, fabrics and clothing’, Woodhead Publishing Limited, Cambridge, England.
2. Mattila H R, ‘Intelligent textiles and clothing’, Woodhead Publishing Limited, Cambridge, England.
3. Adanur S., “Wellington Sears Handbook of Industrial Textiles”, Technomic Publishing Co. Inc., 1995, ISBN : 1 – 56676 – 340 – 1.
4. Bajaj P and Sengupta A K, “Protective Clothing”, The Textile Institute, 1992, ISBN:1-870812 – 44-1.

Reference Books:

1. Tao X, ‘Wearable electronics and photonics’, Woodhead Publishing Limited, Cambridge, England.
2. Hongu T and O’Phillips G, ‘New fibres’ Ellis Horwood, New York.

25BSTT45 (B) - **GEOTEXTILES**

OBJECTIVES

To enable the students to

- Understand the fundamentals of geotextiles and their environmental context.
- Analyze the functions and manufacturing of geotextiles.
- Evaluate the properties and performance of geotextiles.

OUTCOME

Upon completion of this course, the student shall be able to

CO No.	Course Outcome	Level
CO1	Analyze the definition, materials, and basic design principles of geotextiles and apply this knowledge to identify appropriate geotextile types for various applications.	Understand
CO2	Evaluate the primary functions of geotextiles, including separation, filtration, and reinforcement, to recommend their use in specific infrastructure projects.	Apply
CO3	Analyze the properties and manufacturing processes of geotextiles made from natural fibers and apply this analysis to assess their suitability for different environmental conditions.	Analyze
CO4	Evaluate the properties and applications of synthetic fiber-based geotextiles and determine their performance based on current testing standards.	Evaluate
CO5	Create comprehensive evaluation criteria for geotextiles, including morphology, mechanical properties, and filtration efficiency, to assess their overall performance	Understand

	MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**		**M**		
CO3	**S**	**S**	**S**		
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**		**M**

UNIT I BASICS OF GEO TEXTILES

Definition, materials for geo textiles, Basics of soil environmental considerations,geotextile design and application.

UNIT II PRIMARY FUNCTIONS OF GEOTEXTILES

Geotextiles used in separation, filtration, drainage. Geotextiles as reinforcements inroads and railroads, walls and slopes.

UNIT III MANUFACTURING OF GEO TEXTILES FROM NATURAL FIBRES

Natural fibres used for manufacturing of geotextiles, properties of natural fibres,manufacturing process, application of natural fibre based geotextiles, Latest developments in natural geotextiles.

UNIT IV MANUFACTURING OF GEO TEXTILES FROM SYNTHETIC FIBRES

Fibres used in geosynthetics, properties of geosynthetics, applications, testing standards of geosynthetics.

UNIT V EVALUATION OF GEOTEXTILES

Morphology and thermal characterization, Mechanical properties, pore size and distribution, permeability and transmissivity, durability. Filtration efficiency

REFERENCES

6. Koerner, R. Geotextiles: from design to applications. Woodhead Publishing. 2016
7. Leao, A. L., Cherian, B. M., De Souza, S. F., Kozłowski, R. M., Thomas, S., & Kottaisamy,M.” Natural fibres for geotextiles”. Woodhead Publishing. 2012.

25BSTT54 (A) – APPAREL MARKETING AND MERCHANDISING

Course Objectives

- To understand the functions of merchandiser on production and retail perspective.
- To inculcate the knowledge of apparel product lines, development, pricing and sourcing.

Course Outcomes

Upon successful completion of this course the student would be able to,

- Develop the skill to analyze the functions, characteristics and requirements of a merchandiser.
- Diagnose the role of exporters, manufacturer, merchant exporter and job workers.
- Identify the suitable SCM procedure.

CO No.	Course Outcome	Level
CO1	Understand the functions, responsibilities, and characteristics of a merchandiser in the textile industry.	Understand
CO2	Analyze the skills required to perform as an effective merchandiser in domestic and international markets.	Analyze
CO3	Distinguish between the roles of exporters, manufacturers, merchant exporters, and job workers.	Analyze
CO4	Identify and apply appropriate supply chain management (SCM) procedures relevant to the textile sector.	Evaluate
CO5	Evaluate different SCM strategies for improving efficiency and reducing costs in the merchandising process.	Apply

	MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	**S**				**M**
CO2	**S**		**M**	**M**	
CO3	**M**		**M**	**S**	
CO4	**M**	**S**	**S**		
CO5	**S**	**S**	**S**		**M**

UNIT I

Merchandising: Definition – functions - division - role and responsibilities. Types of buyers - communications with the buyers – awareness of current market trends – product development – tech pack analysis - order confirmation process. Export Merchandising. Classification of exporters: Manufacturer, Merchant, Job worker (CM/CMT). Introduction to buying house.

UNIT II

Merchandiser's Role: Proto type to production model – samples, types of samples, sampling procedures, production planning, vendor based rationalization, order placement, in-house and sub-contractor units. Approval: types of approval, approval procedure, buyer approval and organizational approval. Record maintenance. Vendor evaluation and rating.

UNIT III

Marketing: Fashion consumer typologies, Maslow's hierarchy of needs, 4 P's, SWOT analysis, marketing research process, importance of marketing. Marketing mix – pricing, product and brand distribution channels. Market size, structure and environment.

UNIT IV

Marketing Research: Definition, role in apparel business, use of research findings for marketing decisions and action plans. Marketing research techniques – translation of business and marketing problems into research issues and design, survey design, data types and collection methods, sample design and statistical inference. Model building and analysis methods.

UNIT V

Sourcing: Definition, types and methods of sourcing. Sourcing decision in practice – Bought out component.

Supply Chain Management: Introduction and benefits. Push/pull concepts. Supply Chain strategies. Use of barcoding and RFID. **Warehousing:** Introduction, types and importance.

TEXT BOOKS:

1. Kunz G I, 'Merchandising- Theory, Principles and Practice', II Edition, Fairchild Publications, Inc. New York. 2005
2. Easey M(Ed), 'Fashion Marketing', Blackwell Science, 1994.
3. Rosenau J & Wilson D, "Apparel Merchandising: the Line Starts Here", Fairchild Books, 3rd Edition, 2014.
4. Glock R & Kunz G I, "Apparel Manufacturing: Sewn Product Analysis", Pearson / Prentice Hall Inc. 4th Edition, 2005
5. Harder F, "Fashion for Profit", Harder Publication, 10th Edition, 2014.
6. Stone E & Samples J, "Fashion Merchandising", McGraw Hill, 5th Edition. 1990.

REFERENCES:

1. Easey M, 'Fashion marketing', 3rd Edition, Edited by, ISBN 13:9781405/39533, (2009).
2. Jackson T and show D, 'Mastering Fashion Marketing', (2009)

25BSTT54 (B) – RETAIL MANAGEMENT

Course Objectives

- To give an understanding to the students about the significant role of retailing in the marketing system.
- To give inputs to gain insights on the issues involved in organizing and establishing a retail format.
- To enable the students to understand about the pricing and promotion strategies in retailing.

Course Outcomes

i. Able to effectively perform the role of a store manager.
ii. Able to decide on the length of product assortment based on the store format and shoppers' profile.
iii. Skill of identifying a right store location for any given retail format.
iv. Skill of designing promotion strategies to promote the retail outlet.
v. Skill of designing appropriate atmospherics that enhances the shopping experience suits the outlet's image.
vi. Skill of appropriately choosing a pricing strategy that doesn't exceed the shoppers' reference prices.

CO No.	Course Outcome	Level
CO1	Perform the role of a retail/store manager effectively, understanding daily operations and responsibilities.	Understand
CO2	Decide the appropriate product assortment based on store format and target shopper profiles.	Apply
CO3	Identify ideal store locations for various retail formats based on market and consumer analysis.	Analyze
CO4	Design effective promotional strategies to attract and retain customers in retail settings.	Evaluate
CO5	Develop pricing and store atmospherics strategies aligned with customer expectations and brand image.	Understand

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1		**M**		**S**	
CO2	**S**	**M**	**M**		
CO3	**M**	**S**	**M**		
CO4		**M**		**S**	
CO5		**S**	**M**	**S**	

UNIT 1

Concept of retailing, Functions of retailing, Terms and Definition, Retail formats and types, Retailing Channels, Non-Store Retailing- On-line sales, Retail Industry in India, Importance of retailing, changing trends in retailing. FDI in Indian retail and its importance* - Strategies of international retailers in India*

UNIT 2

Importance of Retail locations, Types of retail locations, Factors determining the location decision, Steps involved in choosing a retail locations, Measurement of success of location, Retail value chain, Retail market segmentation, targeting and positioning

UNIT 3

Meaning of Merchandising, Factors influencing Merchandising, Functions of Merchandising Manager, Merchandise planning, Merchandise buying, Analysing Merchandise performance

UNIT 4

Store layout and Design, Visual Merchandising, Promotions Strategy, Retail Marketing Mix, Retail Communication Mix, Store administration, Premises management, Inventory Management, Store Management, Receipt Management, Customer service, Retail Pricing, Factors influencing retail prices, pricing strategies, controlling costs

UNIT 5

Changing nature of retailing*, organized retailing*, Modern retail formats, E-tailing, Challenges faced by the retail sector*

REFERENCES

1. Pradhan S, "Retailing Management", Tata McGraw Hill, New Delhi, 3rdEdition,2009.
2. Levy M, Weitz B & Pandit A, "Retailing Management", Tata Mc Graw Hill, New Delhi, 6th Edition, 2008.
3. Bajaj B, "Retail Management", Oxford University Press, 2nd Edition,2010.
4. Ogden J & Ogden D, "Integrated Retail Management", Biztantra, 2007.

Self-study topics

25BSTT55 (A) - SUSTAINABLE TECHNICAL TEXTILE

Course Objectives

- Explore approaches to sustainability in textile design and recycling
- Analyze sustainable fibers and biodegradable materials.
- Develop eco-friendly functional textile solutions.

Course outcomes

Upon successful completion of this subject, the students should be able to:

CO No.	Course Outcome	Level
CO1	Analyze the strategies and processes involved in textile recycling and apply this knowledge to design more sustainable textile systems.	Analyze
CO2	Evaluate the properties and applications of various sustainable fibers, including natural and synthetic options, for their effectiveness in technical textiles.	Evaluate
CO3	Apply techniques for creating biodegradable composites from biowaste and assess their performance in practical applications such as automotive and industrial uses.	Apply
CO4	Analyze the effectiveness of eco-friendly nonwoven materials including flushable and PLA fiber-based products, and evaluate their degradability and practical applications.	Analyze
CO5	Create sustainable functional textiles by developing and testing herbal plant-based textiles for antimicrobial properties and evaluating their impact on human health and the environment.	Apply

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1				M	
CO2					S
CO3	S				
CO4		M			
CO5			S		

UNIT I:

APPROACHES TO SUSTAINABILITY: Key issues affecting textile design, Strategies for technical textile design, Strategies for textile designers: recycling and reuse – beginning to close the loop, the designer empowered.-Reduce disposal to landfills by raising consciousness concerning ecological issues, channels for disposal, and environmentally conscious business ethics. Steps for more sustainable use and disposal of post- consumer technical textiles. Textile recycling: a system perspective, Introduction to Systems theory, Understanding the

textile recycling process, the sorting process, the pyramid model, Textile recycling constituents

UNIT II:

SUSTAINABLE FIBRES: Characteristics and applications of Bast (hemp, kenaf, jute, flax, abaca), alginate, synthetic silks, poly(lactic acid), poly(hydroxy alkynoates) and poly(caprolactone) fibres for use in technical textiles. End-of-life fibre degradation by microbes - Background and terminology, Incubation conditions used for studying biodegradation of fibers and films, Sources of microorganisms and enzymes for laboratory incubations, Analytical methods used to assess biodegradation of fibers and films, Examples of types of bonds that are susceptible to enzymatic attack, Future trends.

UNIT III:

BIOWASTE-BASED AND BIODEGRADABLE COMPOSITES: Natural geotextiles – manufacture and evaluation. Biodegradable resins, soy- based green composites- Lignocellulosic biomass-reinforced composites employed in various automobile and industrial applications. Role of alkali treatment and chemical modifications in improving the interfacial bonding between the filler and the matrix. Identify the abundantly available biomass to be used as reinforcement for certain application in industrial as well as household composites.

UNIT IV:

ECOFRIENDLY NONWOVENS: Advances in period style in, Different styles, and use of Colours, design & texture in home furnishing. Developments in living room furnishing including upholstery, Wall Hangings, Cushion, Cushion Covers, Bolster and Bolster Cover. Flushable nonwovens. PLA fibre-based materials. Assessing the degradability of these products. Use of recovered polyethylene plastic bags as a binder material in nonwoven fabrics. Web forming and bonding methods involving shredded plastic bags: Applications as sound-proofing and thermal insulation materials and the evaluations thereof.

UNIT V:

MODULE Name: SUSTAINABLE FUNCTIONALIZATION: Ecotoxicological issues of flame retardants and the risk of flame-retardant textiles to human health. Drivers for minimizing environmental as well as human health implications. Strategies for the development of sustainable environmentally friendly flame retardants. Identifying governmental and non- governmental organisations that are directly associated with sustainability, renewability and recyclability of flame-retardant chemicals. Utilization of herbal plant-based textiles for anti-microbial functionality. Biological characterization of natural dyed textiles. Isolation of biological potent functional molecules from herbal based plant source.

TEXT BOOK:

1. Blackburn Ed "Biodegradable and Sustainable Fibres," Wood Head Pub, 2006.
2. Blackburn Ed "Sustainable Textiles : Life Cycle and Environmental Impact,". Wood head, Pub 2009.
3. Maity Ed "Functional and Technical Textiles" Textile Institute, 2023.

25BSTT55 (B) – MILITARY TEXTILES

Course Objectives

- Understand military textile requirements and design.
- Explore high-performance fabrics for military applications.
- Evaluate military textile performance and comfort.

Course outcomes

Upon successful completion of this subject, the students should be able to:

i. Learn about the various applications of textiles in medical field as medical textiles

ii. Learn about product innovation, marketing, regulation and quality testing criteria involved in medical textiles.

iii. Gain skills to start an entrepreneurial career in medical textiles, which is a quick expanding industrial sector.

CO No.	Course Outcome	Level
CO1	Analyze the ergonomic requirements and design processes for military textiles to evaluate material selection and protection systems.	Understand
CO2	Create materials and clothing designs that ensure comfort and thermoregulation for extreme weather conditions to address physiological responses and provide appropriate protective gear.	Understand
CO3	Evaluate the performance of military textiles through mechanical and ballistic testing, as well as chemical and biological resistance, to assess their suitability for military applications	Evaluate

	MAPPING OF COURSE OUTCOMES ANDPROGRAMME OUTCOMES (S – Strong, M-Medium)				
COs / POs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**
CO1	S	M		M	S
CO2	M	S	S	M	M
CO3	S	M	M	M	S

UNIT I: REQUIREMENTS OF MILITARY TEXTILES

Ergonomics of protective clothing, - fit, heat strain, physiological and psychological load in protective textiles. Engineering design of military uniforms – Design process, material selection suitable for NBC threats, adapting intelligent individual protection systems.

UNIT II: CAMOUFLAGE FABRICS

Human Perception, Colour and pattern, Camouflage design considerations. Chromic materials, Synthesis of new and conductive polymers, surface attachment of hromophores.

UNIT III: HIGH PERFORMANCE BALLISTIC AND NBC WARFARE CLOTHING

Requirements of fibre property to withstand ballistic force. High performance fibres – Ballistic, high temperature. HMPE fibre, PBO fibre. Standards for NBC threat protective clothing, self- decontaminating materials.

UNIT IV: WEATHER CLOTHING

Comfort and thermoregulation for hot and cold weather climatic conditions. Materials used for extreme weather conditions. Physiological responses to cold weather, Footwear, gloves, head gears and tents for extreme climatic conditions. Estimation of thermal insulation for cold weather climates. Smart textiles for comfort and thermoregulation.

UNIT V: EVALUATION OF MILITARY TEXTILES

Mechanical Testing, ballistic testing, Comfort properties, Thermal insulation using thermal manikins, Chemical and biological resistance measurement, UV and flame protection testing.

REFERENCES:

6. Wilusz, E. (Ed.). (2008). Military textiles. Elsevier.
7. 1.Jayaraman, S., Grancaric, A. M., & Kiekens, P. (Eds.). (2006). Intelligent textiles for personal protection and safety (Vol. 3). IOS press.
8. Sparks, E. (Ed.). (2012). Advances in military textiles and personal equipment. Elsevier.