DEPARTMENT OF TEXTILE TECHNOLOGY
ANNA UNIVERSITY, CHENNAI

Vision:
The Vision of the Department of Textile Technology, Anna University is to be recognized as a leader in textile and apparel technology education, research and application of knowledge and skills to benefit the society.

Mission:
The mission of the Department of Textile Technology, Anna University is

- To deliver the highest quality textile and apparel technologists with societal values.
- To carry out cutting-edge research and develop innovative technology for the benefit of society at national and international level.
- To inculcate a sense of highest ethical and professional standards among the students.
PROGRAM EDUCATIONAL OBJECTIVES (PEOs):

Bachelor of Apparel Technology curriculum is designed to prepare the undergraduates to

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

PROGRAM OUTCOMES (POs):

The Apparel Technology Graduates will have the ability to

1. Identify, formulate, review literature and critically analyze the technological problems in the apparel industry to reach substantiated conclusion
2. Apply knowledge of mathematics, sciences, engineering and apparel technology to get solution for the technological problems in apparel industry
3. Design and develop the solutions to the technological and managerial problems in apparel industry with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
4. Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions to the technological problems in apparel industry
5. Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools for managing apparel manufacturing companies with an understanding of the limitations
6. Apply reasoning gained through the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the profession
7. Understand the impact of the developed solutions in societal and environmental contexts, and demonstrate the knowledge for sustainable development
8. Understand ethical and professional responsibilities
9. Function effectively as an individual, and as a member or leader in diverse teams in the profession
10. Communicate effectively on complex engineering activities with the engineering community and with society at large. Able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
12. Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):
The Apparel Technology Graduates will have the ability to

1. Understand and apply the technical knowledge for managing garment manufacturing industry
2. Be a successful entrepreneur, fashion designer and professional for apparel management
3. Design and develop novel apparel products and apparel manufacturing processes
## Mapping of Programme Educational Objectives with Programme Outcomes

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<th>Program Educational Objectives</th>
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### Mapping of Course Outcomes with Program Outcomes

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<td>7. Fundamentals of Knitting and Nonwoven Manufacture</td>
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<td>8. Garment Production Machinery</td>
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<td>18. Apparel Production Planning and Process Control</td>
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**PROFESSIONAL ELECTIVE COURSES (PEC)**

<p>| 1. Apparel Accessories and Weaving                                               | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |</p>
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### ENGINEERING SCIENCE COURSE [ESC]

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# ANNA UNIVERSITY :: CHENNAI
# UNIVERSITY DEPARTMENTS
# B.TECH. APPAREL TECHNOLOGY
# REGULATIONS–2019
# CHOICEBASED CREDIT SYSTEM
# CURRICULUM AND SYLLABI FOR I TO VIII SEMESTERS

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* Audit Course is optional
**Students shall undergo Internship/Training for a minimum period of 4 weeks and assessment of the same will be done fifth semester
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* Audit Course is optional

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* Students have to undergo Internship/Training for a minimum period of 4 weeks and assessment of the same will be done during VI semester.
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## SUMMARY

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OBJECTIVES:
The first semester English course entitled ‘Technical English’ aims to,
- Familiarize first year students of engineering and technology with the fundamental aspects of technical English.
- Develop all the four language skills by giving sufficient practice in the use of the skills in real life contexts.
- Enhance the linguistic and communicative competence of first year engineering and technology students.

UNIT I  INTRODUCING ONESELF  
Listening: Listening and filling a form, listening to speeches by specialists from various branches of engineering and completing activities such as answering questions, identifying the main ideas of the listening text, style of the speaker (tone and tenor) – Speaking: Introducing oneself – introducing friend/ family - Reading: Descriptive passages (from newspapers / magazines)- Writing: Writing a paragraph (native place, school life)- Grammar: Simple present, present continuous – Vocabulary Development: One word substitution

UNIT II  DIALOGUE WRITING  
Listening: Listening to conversations (asking for and giving directions) –Speaking: making conversation using (asking for directions, making an enquiry), Role plays-dialogues- Reading: Reading a print interview and answering comprehension questions-Writing: Writing a checklist, Dialogue writing- Grammar: Simple past – question formation (Wh- questions, Yes or No questions, Tag questions)- Vocabulary Development: Stress shift, lexical items related to the theme of the given unit.

UNIT III  FORMAL LETTER WRITING  
Listening: Listening to speeches by famous people and identifying the central message of the speech – answering multiple-choice questions)-Speaking: Giving short talks on a given topic- Reading: Reading motivational essays on famous engineers and technologists (answering open-ended and closed questions)- Writing: Writing formal letters/ emails (Complaint letters)-Grammar: Future Tense forms of verbs, subject and verb agreement-Vocabulary Development: Collocations – Fixed expressions

UNIT IV  WRITING COMPLAINT LETTERS  

UNIT V  WRITING DEFINITIONS AND PRODUCT DESCRIPTION  
Listening: Listening to a product description (labeling and gap filling) exercises- Speaking: Describing a product and comparing and contrasting it with other products- Reading: Reading graphical material for comparison (advertisements)-Writing: Writing Definitions (short and long) – compare and contrast paragraphs- Grammar: Adjectives – Degrees of comparison - compound nouns- Vocabulary Development: Use of discourse markers – suffixes (adjectival endings).

TOTAL : 60 PERIODS

Learning Outcomes
At the end of the course the students will have gained,
- CO1 Exposure to basic aspects of technical English.
- CO2 The confidence to communicate effectively in various academic situations.
- CO3 Learnt the use of basic features of Technical English.
- CO4 Writing features of Technical English
- CO5 Writing complaint letters
Textbook:

Assessment Pattern
- Assessments will assess all the four skills through both pen and paper and computer based tests.
- Assessments can be pen and paper based, quizzes.
OBJECTIVES:

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications.
- To familiarize the students with differential calculus.
- To familiarize the student with functions of several variables. This is needed in many branches of engineering.
- To make the students understand various techniques of integration.
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications.

UNIT I  MATRICES

UNIT II  DIFFERENTIAL CALCULUS

UNIT III  FUNCTIONS OF SEVERAL VARIABLES

UNIT IV  INTEGRAL CALCULUS
Definite and indefinite integrals - substitution rule - techniques of integration - integration by parts, trigonometric integrals, trigonometric substitutions, integration of rational functions by partial fraction, integration of irrational functions - improper integrals.

UNIT V  MULTIPLE INTEGRALS

TOTAL :60 PERIODS

OUTCOMES:

At the end of the course the students will be able to

CO1 Use the matrix algebra methods for solving practical problems.
CO2 Apply differential calculus tools in solving various application problems.
CO3 Able to use differential calculus ideas on several variable functions.
CO4 Apply different methods of integration in solving practical problems.
CO5 Apply multiple integral ideas in solving areas, volumes and other practical problems.
TEXTBOOKS:

REFERENCES:
OBJECTIVE

- To make the students understand the importance of mechanics.
- To equip the students on the knowledge of electromagnetic waves.
- To introduce the basics of oscillations, optics and lasers.
- To enable the students in understanding the importance of quantum physics.
- To elucidate the application of quantum mechanics towards the formation of energy bands in crystalline materials.

UNIT I  MECHANICS

Moment of inertia (m.i) - radius of gyration - theorems of m .i - m.i of circular disc, solid cylinder, hollow cylinder, solid sphere and hollow sphere - k.e of a rotating body – m.i of a diatomic molecule – rotational energy state of a rigid diatomic molecule - centre of mass – conservation of linear momentum – relation between torque and angular momentum - torsional pendulum.

UNIT II  ELECTROMAGNETIC WAVES

Gauss’s law – faraday’s law - ampere’s law - the maxwell’s equations - wave equation; plane electromagnetic waves in vacuum, conditions on the wave field - properties of electromagnetic waves: speed, amplitude, phase, orientation and waves in matter - polarization - producing electromagnetic waves - energy and momentum in em waves: intensity, waves from localized sources, momentum and radiation pressure - cell-phone reception. Reflection and transmission of electromagnetic waves from a non-conducting medium-vacuum interface for normal incidence.

UNIT III  OSCILLATIONS, OPTICS AND LASERS


UNIT IV  BASIC QUANTUM MECHANICS

Photons and light waves - electrons and matter waves - the schrodinger equation (time dependent and time independent forms) - meaning of wave function - normalization - particle in a infinite potential well - normalization, probabilities and the correspondence principle.

UNIT V  APPLIED QUANTUM MECHANICS

The harmonic oscillator - barrier penetration and quantum tunneling - tunneling microscope - resonant diode - finite potential wells - particle in a three dimensional box - bloch’s theorem for particles in a periodic potential, kronig-penney model and origin of energy bands.

TOTAL: 45 PERIODS

OUTCOME

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

- CO1 Understanding the importance of mechanics.
- CO2 Express the knowledge of electromagnetic waves.
- CO3 Know the basics of oscillations, optics and lasers.
- CO4 Understanding the importance of quantum physics.
- CO5 Apply quantum mechanical principles towards the formation of energy bands in crystalline materials.
TEXT BOOKS

REFERENCES
OBJECTIVES:

- To introduce the basic concepts of polymers, their properties and some of the important applications.
- To impart knowledge on the basic principles and preparatory methods of nanomaterials.
- To facilitate the understanding of the laws of photochemistry, photoprocesses and instrumentation & applications of spectroscopic techniques.
- To familiarize the operating principles and applications of energy conversion, its processes and storage devices.
- To inculcate sound understanding of water quality parameters and water treatment techniques.

UNIT I POLYMER CHEMISTRY

Introduction: functionality-degree of polymerization. classification of polymers- natural and synthetic, thermoplastic and thermosetting. types and mechanism of polymerization: addition (free radical, cationic, anionic and living); condensation and copolymerization. properties of polymers: Tg, tacticity, molecular weight-weight average, number average and polydispersity index. Techniques of polymerization: Bulk, emulsion, solution and suspension. structure, properties and uses of: PE, PVC, PC, PTFE, PP, Nylon 6, Nylon 66, Bakelite, Epoxy; Conducting polymers – polyaniline and polypyrrole.

UNIT II NANOCHEMISTRY


UNIT III PHOTOCHEMISTRY AND SPECTROSCOPY


UNIT IV ENERGY CONVERSIONS AND STORAGE

Nuclear fission - controlled nuclear fission - nuclear fusion - differences between nuclear fission and fusion - nuclear chain reactions - nuclear energy - light water nuclear power plant – fast breeder reactor. Solar energy conversion - solar cells. Wind energy. Batteries - types of batteries – primary battery (dry cell), secondary battery (lead acid, nickel-cadmium and lithium-ion-battery). Fuel cells – H₂-O₂ and microbial fuel cell. Explosives – classification, examples: TNT, RDX, Dynamite; Rocket fuels and propellants – definition and uses.

UNIT V WATER TECHNOLOGY


TOTAL: 45 PERIODS
OUTCOMES:
CO1: To recognize and apply basic knowledge on different types of polymeric materials, their general preparation methods and applications to futuristic material fabrication needs.
CO2: To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
CO3: To identify and apply suitable spectroscopic technique for material analysis and study different forms of photochemical reactions.
CO4: To recognize different forms of energy resources and apply them for suitable applications in energy sectors.
CO5: To demonstrate the knowledge of water and their quality in using at different industries.

TEXT BOOKS:

REFERENCE BOOKS:
COURSE OBJECTIVES: The main learning objective of this course is to prepare the students for:

1. Drawing free hand sketches of basic geometrical shapes and multiple views of objects.
2. Drawing orthographic projections of lines and planes.
3. Drawing orthographic projections of solids.
4. Drawing development of the surfaces of objects.
5. Drawing isometric and perspective views of simple solids.

CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION) 1

Importance of graphics in engineering applications – use of drafting instruments – bis conventions and specifications – size, layout and folding of drawing sheets – lettering and dimensioning.

UNITI PLANE CURVES AND FREE HANDSKETCHING 14

Basic geometrical constructions, curves used in engineering practices-conics – construction of ellipse, parabola and hyperbola by different methods – construction of cycloid – construction of involutes of square and circle – drawing of tangents and normal to the above curves. Visualization concepts and free hand sketching: visualization principles – representation of three-dimensional objects – layout of views- free hand sketching of multiple views from pictorial views of objects

UNITII PROJECTION OF POINTS, LINES AND PLANE SURFACES 15

Orthographic projection- principles-principle planes-first angle projection-projection of points. Projection of straight lines (only first angle projections) inclined to both the principal planes-determination of true lengths and true inclinations by rotating line method and trapezoidal method and traces projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNITIII PROJECTION OF SOLIDS 15

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to both the principal planes by rotating object method and auxiliary plane method.

UNITIV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES 15

Sectioning of solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other – obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids – prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs and holes.

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 12


COMPUTER AIDED DRAFTING (DEMONSTRATION ONLY) 3

Introduction to drafting packages and demonstration of their use
COURSE OUTCOMES: Upon completion of this course, the students will be able to:

CO1. Draw free hand sketching of basic geometrical shapes and multiple views of objects.
CO2. Draw orthographic projections of lines and planes
CO3. Draw orthographic projections of solids
CO4. Draw development of the surfaces of objects
CO5. Draw isometric and perspective views of simple solids.

TEXT BOOKS:


REFERENCES:


Publication of Bureau of Indian Standards:


Special points applicable to University Examinations on Engineering Graphics:

1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets of A3 size only.
4. The students will be permitted to use appropriate scale to fit solution within A3 size.
5. The examination will be conducted in appropriate sessions on the same day.
COURSE OBJECTIVES: The main learning objective of this course is to prepare the students for:

1. Applying the various methods to determine the resultant forces and its equilibrium acting on a particle in 2D and 3D.
2. Applying the concept of reaction forces (non-concurrent coplanar and noncoplanar forces) and moment of various support systems with rigid bodies in 2D and 3D in equilibrium. Reducing the force, moment, and couple to an equivalent force - couple system acting on rigid bodies in 2D and 3D.
3. Applying the concepts of locating centroids/center of gravity of various sections / volumes and to find out area moments of inertia for the sections and mass moment of inertia of solids.
4. Applying the concepts of frictional forces at the contact surfaces of various engineering systems.
5. Applying the various methods of evaluating kinetic and kinematic parameters of the rigid bodies subjected to concurrent coplanar forces.

UNIT I  STATICS OF PARTICLES  (9+3)
Fundamental concepts and principles, systems of units, method of problem solutions, statics of particles -forces in a plane, resultant of forces, resolution of a force into components, rectangular components of a force, unit vectors. Equilibrium of a particle- newton's first law of motion, space and free-body diagrams, forces in space, equilibrium of a particle in space.

UNIT II  EQUILIBRIUM OF RIGID BODIES  (9+3)
Principle of transmissibility, equivalent forces, vector product of two vectors, moment of a force about a point, varignon's theorem, rectangular components of the moment of a force, scalar product of two vectors, mixed triple product of three vectors, moment of a force about an axis, couple - moment of a couple, equivalent couples, addition of couples, resolution of a given force into a force -couple system, further reduction of a system of forces, equilibrium in two and three dimensions - reactions at supports and connections.

UNIT III  DISTRIBUTED FORCES  (9+3)
Centroids of lines and areas – symmetrical and unsymmetrical shapes, determination of centroids by integration , theorems of pappus-guldinus, distributed loads on beams, centre of gravity of a three-dimensional body, centroid of a volume, composite bodies, determination of centroids of volumes by integration.

Moments of inertia of areas and mass - determination of the moment of inertia of an area by integration, polar moment of inertia, radius of gyration of an area, parallel-axis theorem, moments of inertia of composite areas, moments of inertia of a mass - moments of inertia of thin plates, determination of the moment of inertia of a three-dimensional body by integration.

UNIT IV  FRICTION  (9+3)
The laws of dry friction. Coefficients of friction, angles of friction, wedges, wheel friction. Rolling resistance, ladder friction.

UNIT V  DYNAMICS OF PARTICLES  (9+3)
Kinematics - rectilinear motion and curvilinear motion of particles. Kinetics- newton’s second law of motion -equations of motions, dynamic equilibrium, energy and momentum methods - work of a force, kinetic energy of a particle, principle of work and energy, principle of impulse and momentum, impact, method of virtual work - work of a force, potential energy, potential energy and equilibrium.
COURSE OUTCOMES: Upon completion of this course, the students will be able to:

CO1. Apply the various methods to determine the resultant forces and its equilibrium acting on a particle in 2D and 3D.
CO2. Apply the concept of reaction forces (non-concurrent coplanar and noncoplanar forces) and moment of various support systems with rigid bodies in 2D and 3D in equilibrium. Reducing the force, moment, and couple to an equivalent force - couple system acting on rigid bodies in 2D and 3D.
CO3. Apply the concepts of locating centroids / center of gravity of various sections / volumes and to find out area moments of inertia for the sections and mass moment of inertia of solids.
CO4. Apply the concepts of frictional forces at the contact surfaces of various engineering systems.
CO5. Apply the various methods of evaluating kinetic and kinematic parameters of the rigid bodies subjected to concurrent coplanar forces.

TEXT BOOKS:


REFERENCES:

PHYSICS LABORATORY: (Any Seven Experiments)

OBJECTIVE

- To inculcate experimental skills to test basic understanding of physics of materials including properties of matter, thermal and optical properties.
- To induce the students to familiarize with experimental determination of velocity of ultrasonic waves and band gap determination.

LIST OF EXPERIMENTS:

1. Torsional pendulum - Determination of rigidity modulus of wire and moment of inertia of disc
2. Non-uniform bending - Determination of young’s modulus
3. Uniform bending – Determination of young’s modulus
4. Lee’s disc Determination of thermal conductivity of a bad conductor
5. Potentiometer-Determination of thermo e.m.f of a thermocouple
6. Laser- Determination of the wave length of the laser using grating
7. Air wedge - Determination of thickness of a thin sheet/wire
8. a) Optical fibre -Determination of Numerical Aperture and acceptance angle
    b) Compact disc- Determination of width of the groove using laser.
10. Ultrasonic interferometer – determination of the velocity of sound and compressibility of liquids
11. Post office box -Determination of Band gap of a semiconductor.
13. Photoelectric effect
14. Michelson Interferometer.
16. Melde’s string experiment

TOTAL: 30 PERIODS

OUTCOME

Upon completion of the course, the students will be able
- CO1. To determine various moduli of elasticity and
- CO2. To determine various thermal and optical properties of materials.
- CO3. To determine the velocity of ultrasonic waves,
- CO4. To determine band gap determination
- CO5. To determine viscosity of liquids.

CHEMISTRY LABORATORY: (Minimum of 8 experiments to be conducted)

OBJECTIVES:

- To inculcate experimental skills to test basic understanding of water quality parameters, such as, acidity, alkalinity, hardness, DO, chloride and copper.
- To induce the students to familiarize with electroanalytical techniques such as, pH metry, potentiometry and conductometry in the determination of impurities in aqueous solutions.
- To demonstrate the analysis of metals and polymers by spectroscopy and viscometry methods.
LIST OF EXPERIMENTS:

1. Estimation of HCl using Na₂CO₃ as primary standard and Determination of alkalinity in water sample.
2. Determination of total, temporary & permanent hardness of water by EDTA method.
3. Determination of DO content of water sample by Winkler’s method.
4. Determination of chloride content of water sample by argentometric method.
5. Estimation of copper content of the given solution by iodometry.
6. Determination of strength of given hydrochloric acid using pH meter.
7. Determination of strength of acids in a mixture of acids using conductivity meter.
8. Estimation of iron content of the given solution using potentiometer.
9. Estimation of iron content of the water sample using spectrophotometer (1, 10- Phenanthroline / thiocyanate method).
10. Estimation of sodium and potassium present in water using flame photometer.
12. Pseudo first order kinetics-ester hydrolysis.
14. Phase change in a solid.

TOTAL: 30 PERIODS

OUTCOMES:

- To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.
- To determine the amount of metal ions through volumetric and spectroscopic techniques
- To determine the molecular weight of polymers by viscometric method.
- To quantitatively analyse the impurities in solution by electroanalytical techniques
- To design and analyse the kinetics of reactions and corrosion of metals

TEXTBOOKS:

COURSE OBJECTIVES: The main learning objective of this course is to provide hands on training to the students in:

1. Drawing pipe line plan; laying and connecting various pipe fittings used in common household plumbing work; Sawing; planing; making joints in wood materials used in common household wood work.
2. Wiring various electrical joints in common household electrical wire work.
3. Welding various joints in steel plates using arc welding work; Machining various simple processes like turning, drilling, tapping in parts; Assembling simple mechanical assembly of common household equipments; Making a tray out of metal sheet using sheet metal work.
4. Soldering and testing simple electronic circuits; Assembling and testing simple electronic components on PCB.

GROUP – A (CIVIL & ELECTRICAL)

PART I CIVIL ENGINEERING PRACTICES 15

PLUMBING WORK:
- a) Connecting various basic pipe fittings like valves, taps, coupling, unions, reducers, elbows and other components which are commonly used in household.
- b) Preparing plumbing line sketches.
- c) Laying pipe connection to the suction side of a pump
- d) Laying pipe connection to the delivery side of a pump.
- e) Connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

WOOD WORK:
- a) Sawing,
- b) Planning and
- c) Making joints like T-Joint, Mortise joint and Tenon joint and Dovetail joint.

Wood Work Study:
- a) Studying joints in door panels and wooden furniture
- b) Studying common industrial trusses using models.

PART II ELECTRICAL ENGINEERING PRACTICES 15

WIRING WORK:
- a) Wiring Switches, Fuse, Indicator and Lamp etc. such as in basic household,
- b) Wiring Stair case light.
- d) Preparing wiring diagrams for a given situation.

Wiring Study:
- a) Studying an Iron-Box wiring.
- b) Studying a Fan Regulator wiring.
- c) Studying an Emergency Lamp wiring.

GROUP – B (MECHANICAL AND ELECTRONICS)

PART III MECHANICAL ENGINEERING PRACTICES 15
WELDING WORK:
   a) Welding of Butt Joints, Lap Joints, and Tee Joints using arc welding.
   b) Practicing gas welding.

BASIC MACHINING WORK:
   a) (simple) Turning.
   b) (simple) Drilling.
   c) (simple) Tapping.

ASSEMBLY WORK:
   a) Assembling a centrifugal pump.
   b) Assembling a household mixer.
   c) Assembling an air conditioner.

SHEET METAL WORK:
   a) Making of a square tray

FONUDRY WORK:
   a) Demonstrating basic foundry operations.

SOLDERING WORK:
   a) Soldering simple electronic circuits and checking continuity.

ELECTRONIC ASSEMBLY AND TESTING WORK:
   a) Assembling and testing electronic components on a small PCB.

ELECTRONIC EQUIPMENT STUDY:
   a) Studying a FM radio.
   b) Studying an electronic telephone.

TOTAL (P: 60) = 60 PERIODS

COURSE OUTCOMES: Upon completion of this course, the students will be able to:

   CO1. Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
   CO2. Wire various electrical joints in common household electrical wire work.
   CO3. Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts
   CO4. Assemble simple mechanical assembly of common household equipments; Make a tray out of metal sheet using sheet metal work.
   CO5. Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.
COURSE OBJECTIVES
The course entitles 'professional communication' aims to,

- Improve the relevant language skills necessary for professional communication.
- Develop linguistic and strategic competence in workplace context.
- Enhance language proficiency and thereby the employability of budding engineers and technologists.

UNIT I  TECHNICAL COMMUNICATION  12
Listening: listening to telephone conversations (intent of the speaker and note taking exercises)- speaking: role play exercises based on workplace contexts, introducing oneself- reading: reading the interview of an achiever and completing exercises (skimming, scanning and predicting)- writing: writing a short biography of an achiever based on given hints- grammar: asking and answering questions, punctuation in writing, prepositional phrases- vocabulary development: use of adjectives.

UNIT II  SUMMARY WRITING  12
Listening: listening to talks/lectures both general and technical and summarizing the main points- speaking: participating in debates- reading: reading technical essays/ articles and answering comprehension questions-writing: summary writing-grammar: participle forms, relative clauses-vocabulary development: use of compound words, abbreviations and acronyms.

UNIT III  PROCESS DESCRIPTION  12
Listening: listening to a process description and drawing a flowchart- speaking: participating in group discussions, giving instructions- reading: reading instruction manuals- writing: writing process descriptions- writing instructions- grammar: use of imperatives, active and passive voice, sequence words- vocabulary development: technical jargon

UNIT IV  REPORT WRITING  12
Listening: listening to a presentation and completing gap-filling exercises- speaking: making formal presentations- reading: reading and interpreting charts/tables and diagrams- writing: interpreting charts/tables and diagrams, writing a report- grammar: direct into indirect speech, use of phrases-vocabulary development: reporting words

UNIT V  WRITING JOB APPLICATIONS  12

TOTAL :60 PERIODS

LEARNING OUTCOMES
At the end of the second semester the learners should be able to,

CO1. Read technical texts effortlessly.
CO2. Comprehend technical texts effortlessly.
CO3. Write reports of a technical kind.
CO4. Speak with confidence in interviews and
CO5. Thereby gain employability

Textbook

Assessment Pattern
- Assessments will assess all the four skills through both pen and paper and computer based tests.
- Assessments can be pen and paper based, quizzes.
OBJECTIVES:

- To acquaint the students with the concepts of vector calculus which naturally arises in many engineering problems.
- To develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property.
- To familiarize the students with complex integration techniques and contour integration techniques which can be used in real integrals.
- To acquaint the students with Differential Equations which are significantly used in Engineering problems.
- To make the students appreciate the purpose of using transforms to create a new domain in which it is easier to handle the problem that is being investigated.

UNIT I  VECTOR CALCULUS  12
Gradient and directional derivative – divergence and curl – irrotational and solenoidal vector fields – line integral over a plane curve – surface integral - area of a curved surface - volume integral - green's theorem, stoke's theorem and gauss divergence theorem – verification and application in evaluating line, surface and volume integrals.

UNIT II  ANALYTIC FUNCTION  12
Analytic functions – necessary and sufficient conditions for analyticity - properties – harmonic conjugates – construction of analytic function - conformal mapping – mapping by functions - bilinear transformation \( w = c + z, \ a z, \ 1/z, \ z^2 \).

UNIT III  COMPLEX INTEGRATION  12

UNIT IV  DIFFERENTIAL EQUATIONS  12

UNIT V  LAPLACE TRANSFORMS  12

TOTAL : 60 PERIODS

OUTCOMES:

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

CO1. Calculate grad, div and curl and use Gauss, Stokes and Greens theorems to simplify calculations of integrals.
CO2. Construct analytic functions and use their conformal mapping property in application problems.
CO3. Evaluate real and complex integrals using the Cauchy’s integral formula and residue theorem.
CO4. Apply various methods of solving differential equation which arise in many application problems.
TEXTBOOKS:


REFERENCES:

OBJECTIVES:
- To know the basics of algorithmic problem solving.
- To develop Python programs with conditionals and loops.
- To define Python functions and use function calls.
- To use Python data structures - lists, tuples, dictionaries.
- To do input/output with files in Python.

UNIT I INTRODUCTION TO COMPUTING AND PROBLEM SOLVING

Suggested Activities:
- Developing Pseudocodes and flowcharts for real life activities such as railway ticket booking using IRCTC, admission process to undergraduate course, academic schedules during a semester etc.
- Developing algorithms for basic mathematical expressions using arithmetic operations.
- Installing Python.
- Simple programs on print statements, arithmetic operations.

Suggested Evaluation Methods:
- Assignments on pseudocodes and flowcharts.
- Tutorials on Python programs.

UNIT II CONDITIONALS AND FUNCTIONS

Suggested Activities:
- Simple Python program implementation using Operators, Conditionals, Iterative Constructs and Functions.
- Implementation of a simple calculator.
- Developing simple applications like calendar, phone directory, to-do lists etc.
- Flow charts for GCD, Exponent Functions, Fibonacci Series using conditionals and iterative statements.
- External learning - Recursion vs. Iteration.

Suggested Evaluation Methods:
- Tutorials on the above activities.
- Group Discussion on external learning.

UNIT III SIMPLE DATA STRUCTURES IN PYTHON

Suggested Activities:
- Implementing python program using lists, tuples, sets for the following scenario: Simple sorting techniques
  Student Examination Report
  Billing Scheme during shopping.
- External learning - List vs. Tuple vs. Set – Implementing any application using all the three data structures.
Suggested Evaluation Methods:
- Tutorials on the above activities.
- Group Discussion on external learning component.

UNIT IV STRINGS, DICTIONARIES, MODULES 10

Suggested Activities:
- Implementing Python program by importing Time module, Math package etc.
- Creation of any package (student’s choice) and importing into the application.

Suggested Evaluation Methods:
- Tutorials on the above activities.

UNIT V FILE HANDLING AND EXCEPTION HANDLING 7

Suggested Activities:
- Developing modules using Python to handle files and apply various operations on files.
- Usage of exceptions, multiple except blocks -for applications that use delimiters like age, range of numerals etc.
- Implementing Python program to open a non-existent file using exceptions.

Suggested Evaluation Methods:
- Tutorials on the above activities.
- Case Studies.

TOTAL: 45 PERIODS

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

CO1. Develop algorithmic solutions to simple computational problems.
CO2. Develop and execute simple Python programs.
CO3. Write simple Python programs for solving problems and decompose a Python program into functions.
CO4. Represent compound data using Python lists, tuples, dictionaries etc.
CO5. Read and write data from/to files in Python programs.

TEXT BOOK:

REFERENCES:
OBJECTIVES:
- To understand the basic concepts of electric circuits, magnetic circuits and wiring.
- To understand the operation of AC and DC machines.
- To understand the working principle of electronic devices and circuits.

UNIT I   BASIC CIRCUITS AND DOMESTIC WIRING    9
Electrical circuit elements (r, l and c)-dependent and independent sources – ohm’s law- kirchhoff’s
laws - mesh current and node voltage methods (analysis with only independent source) - phasors
– rms-average values-sinusoidal steady state response of simple rlc circuits. Types of wiring-
domestic wiring - specification of wires-earthing-methods-protective devices.

UNIT II  THREE PHASE CIRCUITS AND MAGNETIC CIRCUITS    9
Three phase supply – star connection – delta connection –balanced and unbalanced loads- power
in three-phase systems – comparison of star and delta connections – advantages-magnetic
circuits-definitions-mmf, flux, reluctance, magnetic field intensity, flux density, fringing, self and
mutual inductances-simple problems.

UNIT III ELECTRICAL MACHINES    9
Working principle of dc generator, motor-emf and torque equation-types –shunt, series and
compound-applications. Working principle of transformer-emf equation-operating principles of
three phase and single phase induction motor-applications. Working principles of alternator-emf
equation-operating principles of synchronous motor, stepper motor-applications.

UNIT IV  BASICS OF ELECTRONICS    9
Intrinsic semiconductors, extrinsic semiconductors – p-type and n-type, p-n junction, vi
characteristics of pn junction diode, zener effect, zener diode, zener diode characteristics-rectifier
circuits-wave shaping.

UNIT V   CURRENT CONTROLLED AND VOLTAGE CONTROLLED DEVICES    9
Working principle and characteristics - BJT, SCR, JFET, MOSFET.

TOTAL: 45 PERIODS

OUTCOMES:
CO1  To be able to understand the concepts related with electrical circuits and wiring.
CO2  To be able to study the different three phase connections and the concepts of magnetic
circuits.
CO3  Capable of understanding the operating principle of AC and DC machines.
CO4  To be able to understand the working principle of electronic devices such as diode and
zener diode.
CO5  To be able to understand the characteristics and working of current controlled and
voltage controlled devices.

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TEXT BOOKS:
   Education, 2014
   New Delhi, 1989.
REFERENCES:

OBJECTIVE

- The students will be imparted the knowledge on
- Boiler feed water requirements, water treatment techniques,
- Applications of oil and its properties, principles of different chemical analysis
- Different kinds of preparations of important chemicals.

UNIT I WATER TECHNOLOGY


UNIT II OILS, FATS, SOAPS & LUBRICANTS

Chemical constitution, chemical analysis of oils and fats – free acid, saponification and iodine values, definitions, determinations and significance. Soaps and detergents - cleaning action of soap. Lubricants - definition, characteristics, types and properties – viscosity, viscosity index, carbon residue, oxidation stability, flash and fire points, cloud and pour points, aniline point. Solid lubricants – graphite and molybdenum disulphide.

UNIT III CHEMICAL ANALYSIS – AN ANALYTICAL INSIGHT


UNIT IV DYE CHEMISTRY

Witt’s theory and modern theory of colors – synthesis of methyl red, methyl orange, congo red, malachite green, p-rosaniline, phenolphthalein, fluorescence, eosin dyes.

UNIT V CHEMICALS AND AUXILIARIES


TOTAL PERIODS: 45

OUTCOME

CO1. Will be familiar with boiler feed water requirements, water treatment techniques.
CO2. Will know the oil and its properties, principles of different chemical analysis.
CO3. Will know the preparations of important chemicals.
CO4. Will understand chemistry of dyes
CO5. Will understand the auxiliaries required for dyeing

TEXT BOOKS


REFERENCE BOOKS

OBJECTIVES:

- To understand the problem solving approaches.
- To learn the basic programming constructs in Python.
- To articulate where computing strategies support in providing Python-based solutions to real world problems.
- To use Python data structures - lists, tuples, dictionaries.
- To do input/output with files in Python.

EXPERIMENTS:

1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same.
2. Python programming using simple statements and expressions.
3. Scientific problems using Conditionals and Iterative loops.
4. Implementing real-time/technical applications using Lists, Tuples.
5. Implementing real-time/technical applications using Sets, Dictionaries.
6. Implementing programs using Functions.
7. Implementing programs using Strings.
9. Implementing real-time/technical applications using File handling.
10. Implementing real-time/technical applications using Exception handling.
12. Developing a game activity using Pygame like bouncing ball, car race etc.

TOTAL: 60 PERIODS

OUTCOMES:

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

- Develop algorithmic solutions to simple computational problems
- Develop and execute simple Python programs.
- Structure simple Python programs for solving problems.
- Decompose a Python program into functions.
- Represent compound data using Python data structures.

Apply Python features in developing software applications.
OBJECTIVES

1. To impart hands on experience in verification of circuit laws and measurement of circuit parameters
2. To train the students in performing various tests on electrical motors.
3. It also gives practical exposure to the usage of CRO, power sources & function generators

List of Experiments

1. Verification of Kirchhoff’s Law.
2. Steady state response of AC and DC circuits (Mesh, Node Analysis)
3. Frequency response of RLC circuits.
5. Regulation of single phase transformer.
6. Performance characteristics of DC shunt generator.
7. Performance characteristics of single phase induction motor.
8. Characteristics of PN diode and Zener diode
9. Characteristics of Zener diode
10. Half wave and full wave Rectifiers
11. Application of Zener diode as shunt regulator.
12. Characteristics of BJT and JFET

OUTCOMES:

1. To become familiar with the basic circuit components and know how to connect them to make a real electrical circuit;
2. Ability to perform speed characteristic of different electrical machines
3. Ability to use logic gates and Flip flop
OBJECTIVES

- To understand the basics of random variables with emphasis on the standard discrete and continuous distributions.
- To understand the basic probability concepts with respect to two dimensional random variables along with the relationship between the random variables and the significance of the Central Limit theorem.
- To apply the small/large sample tests through Tests of hypothesis.
- To understand the concept of analysis of variance and use it to investigate factorial dependence.
- To monitor a process and detect a situation when the process is out of control.

UNIT I
RANDOM VARIABLES
Discrete and continuous random variables – moments – moment generating functions – binomial, poisson, geometric, uniform, exponential, gamma, weibull and normal distributions – functions of a random variable.

UNIT II
TWO-DIMENSIONAL RANDOM VARIABLES

UNIT III
TESTS OF SIGNIFICANCE
Type I and Type II errors – tests for single mean, proportion, difference of means (large and small samples) – tests for single variance and equality of variances – chi-square test for goodness of fit – independence of attributes – non-parametric tests: test for randomness and rank – sum test (wilcoxon test).

UNIT IV
DESIGN OF EXPERIMENTS
Completely randomized design – randomized block design – latin square design – factorial design – taguchi’s robust parameter design.

UNIT V
STATISTICAL QUALITY CONTROL
Control charts for measurements (\(\bar{X}\) and R charts) – control charts for attributes (p, c and np charts) tolerance limits – acceptance sampling.

TOTAL: 60 PERIODS

OUTCOMES

CO1 To analyze the performance in terms of probabilities and distributions achieved by the determined solutions
CO2 To be familiar with some of the commonly encountered two dimensional random variables and be equipped for a possible extension to multivariate analysis
CO3 To apply the basic principles underlying statistical inference (estimation and hypothesis testing)
CO4 To demonstrate the knowledge of applicable large sample theory of estimators and tests
CO5 To obtain a better understanding of the importance of the methods in modern industrial processes.

TEXT BOOKS:
REFERENCES:

AT5301 TECHNOLOGY OF SPINNING AND WEAVING

OBJECTIVE:
To enable the students to understand different types of yarns, basics of production, yarn numbering system and understand the process of weaving

UNIT I YARN SPINNING
Filament yarn, spun yarn; characteristics of fibres used for spinning; sequence of machines used for production of spun yarn using short staple spinning system; objectives of ginning, spinning preparatory and spinning machine

UNIT II YARN TYPES
Numbering system for yarns- tex, denier and english count; specifications of yarn and their significance; carded yarn, combed yarn, compact spun yarn, rotor spun yarn, airjet spun yarn – structure and characteristics, comparison, applications; blended yarns; multiply and fancy yarns

UNIT III PREPARATORY FOR WEAVING
Purpose and types of winding machines; clearing of yarn faults; warping and sectional warping; sizing, drawing-in and denting

UNIT IV WEAVING
Types of looms – handloom, power loom, automatic looms; primary, secondary and auxiliary motions of a loom; basic principles of shedding- tappet, dobby and jacquard; multi shuttle looms; terry looms

UNIT V SHUTTLELESS WEAVING
Basic concepts of shuttle less looms – rapier, projectile, water jet and air jet looms; yarn requirements, salient features; multi-phase weaving; analysis of fabric defects

OUTCOMES:
Upon completion of this course, the student shall understand
CO1 Process sequence for producing different types of yarns
CO2 Yarn numbering systems, different types of yarns, their structure and properties
CO3 Preparatory processes for weaving
CO4 Principle of weaving
CO5 Weaving by shuttleless looms

TEXT BOOKS:

REFERENCES:
### Course Articulation Matrix:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
To enable the students to understand the
- Structure and morphology of textile fibres
- Physical characteristics textile fibres

UNIT I STRUCTURE OF FIBRES
Definition of fibre - staple fibre, filament; classification of fibres; essential and desirable properties of textile fibres; concepts of molecular weight, degree of polymerization, orientation and crystallinity; characteristics of fibre forming polymer, study of morphological structures of fibers

UNIT II MOISTURE ABSORPTION CHARACTERISTICS
Theories of moisture sorption, desorption and relations; moisture absorption behavior of natural and man-made fibres; methods of measurement of moisture absorption behavior; factors influencing the moisture absorption behavior; conditioning of mass of fibres – mechanism of conditioning and factors influencing the conditioning process; moisture diffusion in fibres; heat of sorption – integral and differential, their relation; factors influencing heat of sorption, measurement of heat of sorption

UNIT III TENSILE AND ELONGATION CHARACTERISTICSOFFIBRES
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 IV OPTICAL, FRICTIONAL AND THERMAL CHARACTERISTICS
Reflection 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; thermal transitions of fibres – Tg and melting; static electricity in textile fibres

UNIT V STRUCTURE INVESTIGATION TECHNIQUES
Analysis of surface morphology, structural morphology; principles of various techniques of structural characterization of fibres; determination of crystallinity of fibres, end group analysis for various fibres; determination of orientation of various fibres by various techniques.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student shall be able to understand
- CO1 Types of fibres and their structure
- CO2 Moisture and absorption characteristics of fibres
- CO3 Tensile and elongation properties of fibres
- CO4 Thermal and other characteristics of fibres
- CO5 Method of investigation of structure of fibres
TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:

- To impart knowledge on elements and principles of design
- To enable the students to understand colour theories, fashion concepts, fashion forecast and portfolio development.
- To understand sewing machine components and practice the basic sewing in the laboratory

UNIT I
Design types – natural, stylized, geometric, historic and abstract; design of garment – structural, decorative and functional; elements of design – line, shape, form, size, colour, texture and pattern; introducing elements of design in garment development.

UNIT II
Principles of design- balance, harmony, proportion, emphasis, rhythm, repetition and unity; balance types – symmetrical, asymmetrical and radial balance; rhythm through repetition, alternation, gradation, radiation and continuous line movement; introducing principles of design in garment development

UNIT III
Colour - dimensions of colour, colour psychology- warm and cool colours, advancing and receding colours, colour theory -Munsell colour system, Prang colour wheel, Ostwald colour system and colour harmonies.

UNIT IV
Fashion terminologies, principles of fashion, fashion life cycle,fashion adoption theories; role of a fashion designer - concept of fashion forecasting and techniques, apparel line for seasons; design analysis for different body types and creating illusion in designs

UNIT V
Stitch types and uses; seam types and uses; components of single needle lockstitch machine and working aids

TOTAL: 30 PERIODS

PRACTICALS
1) Identification of single needle lockstitch machine (SNLS) components and understanding their functions.
2) Needle fixing and threading in single needle, double needle, over-lock, flat lock and feed-of-the-arm machine.
3) Practice for pedal and knee lifter operations and winding the bobbin thread.
4) Sewing exercise on paper in SNLS
   - Exercise 1 - Parallel line
   - Exercise 2 - Square
   - Exercise 3 - Curves
   - Exercise 4 - Concentric curves
5) Stitching exercise on fabric panels in SNLS
   - Exercise 1 - Parallel line
   - Exercise 2 - Square
   - Exercise 3 – Curves
6) Prepare samples in SNLS machine by varying the stitch length and thread tension.

TOTAL: 30 PERIODS

OUTCOMES:
Upon the completion of the course, the student shall be able to understand
- CO1: elements of design and incorporate them in developing a garment.
- CO2: principles of design and incorporate them in developing a garment
- CO3: colour theories
- CO4: Fashion theories and fashion forecasting
- CO5: Stitches, seams and sewing machine components
- CO6: Students shall know components of sewing machine and sew the fabrics practically

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
- To introduce students the anthropometrics measurements and clothing sizing systems
- To enable students understand body measurements across different age groups
- To equip students with comprehensive pattern making skills

UNIT I  BASICS OF ANTHROPOMETRICS AND SIZING SYSTEM  9
Anthropometry measurements –traditional, 3D body scanning; principles of sizing systems; body appearance, its relation to clothing, illusions created by clothing, body ideals-Eight head theory, body proportions, height and weight distribution; standard measurement chart-designation and control dimensions

UNIT II  BODY MEASUREMENTS AND PATTERN TERMINOLOGIES  9
Body measurements- methods of measuring body dimensions, landmark terms; measuring the dress-form, ease and allowances; functions of pattern making tools, pattern grain line, balance line terms, notches, seam allowance, jog seam, dart points, pleats, flares, gather and true bias, truing, blending.

UNIT III  BODICE PATTERNS  9
Drafting method of patternmaking – basic top and bottoms blocks for men and women; draping method of pattern making – basic bodice – front, back and skirt for women

UNIT IV  PATTERNS FOR OTHER GARMENT COMPONENTS  9
Pocket classification; collar classification and terms, basic shirt collar, Peter Pan collar, sailor collar, mandarin collar; built-up neck lines, halter neck lines, cowls; sleeve cap, sleeve cuffs, puff, petal, lantern and leg-of-mutton sleeves; Yoke styles, plackets; facing patterns for cut-out necklines and armholes.

UNIT V  PATTERNMAKING PRINCIPLES  9
Principles of patternmaking - dart manipulation, added fullness and contouring principles; drafting method-single and two dart series-slash-spread technique, pivotal transfer technique; graduated and radiating darts; parallel, asymmetric and intersecting darts; draping method-basic bodice blocks-two and one dart blocks.

OUTCOMES:
On completion of the course students are expected to
CO1. Take cognizance of the significance of Anthropometric and the clothing sizing systems
CO2. Understand methods of taking body measurements
CO3. Be aware of drafting and draping methods of pattern preparation
CO4. Develop patterns for other garment components using pattern making principles

TEXTBOOKS:

REFERENCES:
### Course Articulation Matrix

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
- To enable the students to practically carry out pattern making and styling of men, women and children garments
- To get hands-on experience in dart manipulations and draping method of pattern making.

LIST OF EXPERIMENTS
1. Measuring the Dress Form – male, female and child and formulating the measurement charts
2. Drafting the basic blocks of male and female
3. Drafting patterns of sleeve variations
4. Drafting patterns of collars, cuffs variations
5. Drafting patterns of pocket variations
6. Dart manipulation of single darts using slash spread and pivotal techniques
7. Dart manipulation of double darts using slash spread and pivotal techniques
8. Graduated and radiating darts
9. Asymmetric dart variations
10. Basic bodice-front, back and skirt patterns using draping technique

TOTAL: 60 PERIODS

OUTCOMES:

On completion of the course, students are expected to

CO1. Develop and understand standard measurement chart formulation
CO2. Construction of basic blocks using drafting and draping techniques
CO3. Patterns construction for different styles
CO4. Dart manipulation techniques and its variations
CO5. Method of solving fitting problems in patterns
1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To enable the students to understand the process of garment construction

UNIT I    LAYING, MARKING AND CUTTING

UNIT II    SEAMS AND STITCHES
Seam types and classes; stitch types and classes, properties and applications; machine elements in sewing

UNIT III   GARMENT COMPONENTS AND ITS STYLINGS
Ladies, men’s and children’s wear – basic blocks, collars, sleeves, cuffs, pleats, gatherings, darts, pockets, welts, yoke; purpose of darts and dart equivalents; innerwear and lingerie; balance and symmetry in garment construction; sewing threads- types and characteristics; stitch parameters; sewing defects

UNIT IV    STYLES AND OPERATION BREAKDOWN
Operation break down for various styles of shirts, trousers, t-shirts, jackets, blouses, skirts, salwar and kameez; material flow and assembly of garments

UNIT V     PRODUCTION PROCESSES
Production systems - full garment assembly, make through, batch production, progressive bundle, straight line assembly, unit production system, modular production system

TOTAL: 45 PERIODS

COURSE OUTCOMES:
Upon completion of this course, the students shall
CO1 - Understand various processes involved in garment construction
CO2 - Know seams and stitches used in garment construction
CO3 - Know various garment components
CO4 - Know operation breakdown for different styles of garments
CO5 - Know different apparel production systems

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To make the students understand fundamentals of knitting and types of knitting processes

UNIT I FUNDAMENTALS OF KNITTING
Reasons for the growth of the knitting industry; comparison of fabric properties-woven, knitted and bonded fabrics; classification of knitting processes – weft knit & warp knit; yarn quality requirements for knitting; general definitions and principles of knitting; types of knitting needles – Bearded, Latch & Compound needle; elements of knitted loop structure

UNIT II KNITTING I
Basic weft knitted structures and their production - plain, rib, interlock and purl; fundamentals of formation of knit, tuck and float stitches; analysis of various types of weft knitted structure

UNIT III KNITTING II
Production of various weft knitted structures using flat knitting machines; Basic principles; elements of warp knitted loop open and closed laps; tricot and raschel warp knitting machines; warp knitted fabrics–structures and enduses; weft and warp knitted fabric defects

UNIT IV WEB PREPARATION FOR NONWOVEN
Introduction; classification – dry laid, wet laid, air laid; principle, machines, processes for web preparation by dry laid, wet laid and air laid; quality control of webs; web preparation by polymeric solution

UNIT V BONDING OF NONWOVEN
Bonding methods- principles, machine; processes for mechanical, thermal, chemical bonding; process parameters; application

TOTAL PERIODS: 30

OUTCOMES
Upon completion of this course, the student shall be able to understand
- CO1: Fundamentals of knitting
- CO2: Basic weft knitted structure
- CO3: Basic warp knitted structure
- CO4: Non woven web formation
- CO5: Non woven bonding techniques

TEXTBOOKS

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To enable the students to learn the machines and mechanisms of machines used for garment production

UNIT I  FABRIC INSPECTION, SPREADING AND CUTTING MACHINES  6
Fabric inspection machinery; spreading machines – manual, semi-automatic and fully automatic machines; mechanism of straight knife, rotary, band knife, die, laser, plasma, water jet and ultrasonic cutting machines; notches, drills and thread markers; computer interfaced cutting machines; safety measures

UNIT II  SEWING MACHINES I  6
Lock stitch and chain stitch sewing machine – types, threading, driving arrangement, function of elements, stitch formation, timing, settings and feed mechanism; selection of machine and process parameters for different applications; safety measures

UNIT III  SEWING MACHINES II  6
Needles-geometry and types, selection; button fixing and button holing machine – mechanism and features

UNIT IV  SEWING MACHINES III  6
Overlock, flatlock, feed-off the arm, zig-zag and embroidery machines– driving arrangement, function of elements, stitch formation, timing, settings and feed mechanism; safety measures

UNIT V  FINISHING MACHINES  6
Pressing machineries – buck pressing, iron pressing, block or die pressing, form pressing, steamers; folding and packing machines; safety measures

TOTAL: 30 PERIODS

PRACTICALS
LIST OF EXPERIMENTS
Study on following mechanisms
   • Needle bar working
   • Hook /Looper mechanism
   • Feeding mechanism
   • Threading and tensioning for
     1. SNLS machine
     2. Chain stitch machine
     3. Overlock machine
     4. Flatlock machine
     5. Feed off arm machine

TOTAL: 30 PERIODS

OUTCOMES:
Upon completion of the course, the students would understand
   CO 1 - Fundamental principle and working of machines used for spreading and cutting
   CO 2 - Stitch formation and other mechanisms of SNLS machine and chain stitch machine
   CO 3 - Principle of button fixing and button holing machines
   CO 4 - Stitch formation and other mechanisms of overlock, flatlock and other special sewing machines
   CO 5 - Different types of finishing machines used for garments
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<td>Stitch formation and other mechanisms of SNLS machine and chain stitch machine</td>
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<td>Principle of button fixing and button holing machines</td>
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<td>Stitch formation and other mechanisms of overlock, flatlock and other special sewing machines</td>
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<td>CO5</td>
<td>Different types of finishing machines used for garments</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
AT5452  PATTERN MAKING II  LT P C
(Prerequisite for this course is AT5351)  3 0 0 3

OBJECTIVES:
To enable the students to develop better understanding on
- pattern construction and styling from basic blocks and
- grading and pattern alteration techniques to provide good fit

UNIT I  MENS WEAR  9
Basic formal shirts, bottom wear styles – slack, cullotte, trouser, jean; coats and jackets

UNIT II  WOMENS WEAR  9
Basic formal shirts, trousers, office jackets; skirts foundation – A line, straight, pegged, bell shaped;
saree blouse; Salwar Kameez

UNIT III  CHILDREN WEAR  9
Basic pattern set; dresses and jumpers; pants and jump suit; baby frocks, rompers

UNIT IV  CASUAL AND PARTY WEAR  9
Beach and leisurewear-swimsuit, bikini, short blocks, beach wraps; Pajamas; Bodysuit; Princess line,
strapless princess-style garments; bias styled dresses- symmetrical and asymmetrical; dresses
without waist lines

UNIT V  PATTERN ALTERATION AND GRADING  9
Pattern alteration for fit, pattern grading process, grade rules and types of grading system

OUTCOMES:
On completion of the course students are expected to
CO1  Develop patterns for men’s wear
CO2  Develop patterns for women’s wear
CO3  Develop patterns for children’s wear dresses
CO4  Understand formal, casual and party wear design styling
CO5  Enable pattern alteration and grading

TOTAL: 45 PERIODS

TEXTBOOKS:

REFERENCES:
2. Winifred Aldrich., “Metric Pattern Cutting for Children’s Wear and Baby Wear”, Blackwell
## Course Articulation Matrix

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<td>CO4</td>
<td>Understand formal, casual and party wear design styling</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:

To enable the students to learn about different structures of woven fabric and design the structure for different applications

UNIT I
Basic weaves – plain, twill, satin, sateen and their derivatives

UNIT II
Ordinary and Brighton 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; bedford cords - plain and twill faced, wadded; welts and piques, wadded piques

UNIT III
Backed fabrics -warp and weft, reversible and non-reversible fabrics; extra warp and extra weft figuring - single and double colour

UNIT IV
Pile fabrics; warp pile - wire pile, terry pile, loose backed; weft pile – plain back and twill back velveteen, lashed pile, corduroy, weft plush

UNIT V
Double cloth- types of stitches; Damasks; Gauze and Leno principles; trade names of popular fabric structures

TOTAL: 30 PERIODS

PRACTICALS:
1. Visual identification of commercially available woven, knitted and nonwoven fabrics
2. Analysis of construction details of the following fabric structures
   i  Plain and its derivatives
   ii  Twill and its derivatives
   iii  Satin (Regular and irregular)
   iv  Sateen (Regular and irregular)
   v  Honeycomb (ordinary and Brighton)
   vi  Huck-a-back
   vii  Extra warp and extra weft figuring
   viii  Pile fabrics (warp and weft)
   ix  Gauze and Leno
   x  Double cloth
   xi  Crepe
   xii  Single jersey and its derivatives
   xiii  Double jersey structures and its derivatives

TOTAL: 60 PERIODS
OUTCOMES:
Upon the completion of this course the student will be able to understand the
- CO1: basic structures of woven fabric
- CO2: colour and weave effect and special weaves
- CO3: structure for backed fabrics and extra warp/weft fabrics
- CO4: Structure of warp and weft pile fabrics
- CO5: special structures and trade names of popular fabric structure
- CO6: Construct the design, draft and peg-plan of fabrics practically
- CO7: Analyse the structure of knitted fabrics practically

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVE:
To enable students to practically carryout pattern making for men, women and children garments

LIST OF EXPERIMENTS
1. Drafting of men’s formal shirt
2. Drafting of trousers – men’s and women’s
3. Drafting of women’s formal shirt
4. Drafting of women’s skirt – any one variation
5. Drafting of saree blouse
6. Drafting of Salwar Kameez
7. Drafting of Princess line (or) bias party wear
8. Drafting of children’s rompers and jumpsuits

OUTCOMES:
On completion of the course students are expected to

CO1 Develop pattern drafting and
CO2 Develop styling skills
CO3 Develop various formal and traditional pattern stylings for women’s garments
CO4 Develop various pattern stylings for men’s and
CO5 Develop various pattern stylings for children’s clothing’s

TOTAL:60 HOURS
## Course Articulation Matrix

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OBJECTIVES
To train the students on construction of different types of garments

LIST OF EXPERIMENTS
1. Sewing practice of different stitch classes
2. Sewing practice of seam types – superimposed seam, lapped seam, bound seam and flat seam.
3. Sewing of different types of plackets
4. Sewing of different types of pockets
5. Sewing of different types of sleeves
6. Sewing of different types of collars and cuff
7. Sewing of different types of neckline finishes
8. Sewing of different types of pleats, tucks and gathers
9. Practice in Button hole and button stitch machines
10. Practice in Feed-off the arm machine
11. Attachment of trims with fabric with different presser foot.

TOTAL: 60 PERIODS

OUTCOMES:
Upon completion of this practical course, the students can
CO 1 - Construct samples for various types of seams and stitches
CO 2 - Construct samples for various types of garment components
CO 3 - Construct samples for various dart equivalents
CO 4 - Carry out button hoiling and button stitching and would have hands on experience on different machines used for garment manufacture.
CO 5 - Construct samples for attachment of trims
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>Program Outcome</th>
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</thead>
<tbody>
<tr>
<td>CO1</td>
<td>Construct samples for various types of seams and stitches</td>
<td>PO 1 PO 2 PO 3</td>
</tr>
<tr>
<td>CO2</td>
<td>Construct samples for various types of garment components</td>
<td>PO 4 PO 5 PO 6</td>
</tr>
<tr>
<td>CO3</td>
<td>Construct samples for various dart equivalents</td>
<td>PO 7 PO 8 PO 9</td>
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<tr>
<td>CO4</td>
<td>Carry out button holing and button stitching and would have hands on experience on different machines used for garment manufacture.</td>
<td>PO 10 PO 11 PO 12</td>
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<tr>
<td>CO5</td>
<td>Construct samples for attachment of trims</td>
<td>PSO 1 PSO 2 PSO 3</td>
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<tr>
<td><strong>Overall CO</strong></td>
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</tbody>
</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVE:

- To explain principles of economics relevant to managing an organization, to describe principles of economics to have the understanding of economic environment of business.
- To study the Evolution, Functions and Principles of Management.

UNIT I : BASIC CONCEPTS OF ECONOMICS AND MARKET
Definition, scope of economics; fundamental concepts; demand, supply, equilibrium; theory of production, cost; forms of market; concepts of revenue; pricing in perfect and imperfect competition.

UNIT II : NATIONAL INCOME AND MONEY
National income - concept, measurement, economic welfare; concept of consumption, saving and investment; economic growth - measurement, fluctuation, control; Money-theory, exchange - Demand and supply of money.

UNIT III : INFLATION AND GOVERNMENT POLICY
Inflation - causes, effect, control; Inflation VS Unemployment, Philips curve; Government policies, Fiscal and Monitoring Policy, planning - economic growth and public welfare.

UNIT IV : MANAGEMENT PRINCIPLES AND ORGANIZATIONS

UNIT V : FUNCTIONS OF MANAGEMENT

OUTCOMES:

- Upon completion of the course,
  - Students are expected to become familiar with principles of economics.
  - Able to perform managerial functions like planning, organizing, staffing, leading & controlling.

REFERENCES:
OBJECTIVE:
To enable the students to learn about basics of pre-treatments, dyeing, printing and finishing of textiles

UNIT I DYEING
Preparatory stages involved in dyeing process, principles of application of direct, reactive, vat, acid, disperse and natural dyes; principles of working of loose fibre, yarn and fabric processing machines, garment dyeing

UNIT II PRINTING
Printing with dyes and pigments; principles of transfer and ink-jet printing; dyeing and printing faults; assessment of fastness properties of dyed and printed goods

UNIT III MEASUREMENT OF COLOUR
Fundamentals of colour science, assessment of colour of dyed and printed goods; assessment of whiteness and yellowness indices and colour difference; pass/fail decision making, basics of colour matching technique

UNIT IV FINISHING
Calendaring, shrink proofing, crease proofing, softening; finishing of knits; garment finishing; methods of assessment of all the above finishes

UNIT V ECO FRIENDLY TEXTILE PROCESSES
Eco friendly chemical processes; banned dyes and chemicals, evaluation techniques for assessment of these agents, eco labels

TOTAL: 45 PERIODS

LIST OF EXPERIMENTS

1. Dyeing of cotton using reactive dyes
2. Printing of cotton fabric by direct/discharge technique
3. Determination of wash, perspiration, light and rubbing fastness of dyed fabrics
4. Determination of skew, bow and shrinkage of dyed fabrics
5. Determination of whiteness and yellowness index
6. Determination of color parameters in fabric using spectrophotometer
7. Determination of residual formaldehyde on garments
8. Determination of PCP estimation on fabrics

TOTAL: 30 PERIODS

OUTCOMES:
Upon completion of theory course, the student shall have the knowledge on
- CO1: Necessity of pre-treatments in dyeing process and principle of dyeing of different materials
- CO2: Methods, styles and different types of printing
- CO3: Fundamentals of colour science and assessment of coloured goods
- CO4: Finishes used for textile and assessment of finishes
- CO5: Eco friendly, banned dyes and their evaluation techniques
- CO6: Upon completion of practical course, the students can dye, print the textile material and measure colour and fastness properties
TEXTBOOKS:


REFERENCES:

## Course Articulation Matrix:

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<tr>
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<td>Necessity of pre-treatments in dyeing process and principle of dyeing of different materials</td>
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<tr>
<td>CO2</td>
<td>Methods, styles and different types of printing</td>
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</tr>
<tr>
<td>CO3</td>
<td>Fundamentals of colour science and assessment of coloured goods</td>
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<tr>
<td>CO4</td>
<td>Finishes used for textile and assessment of finishes</td>
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</tr>
<tr>
<td>CO5</td>
<td>Eco friendly, banned dyes and their evaluation techniques</td>
<td>-</td>
</tr>
<tr>
<td>CO6</td>
<td>Upon completion of practical course, the students can dye, print the textile material and measure colour and fastness properties</td>
<td>-</td>
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</tbody>
</table>

| Overall CO      |                                                                           | -    | -    | -    | -    | -    | 3    | 2    | 2    | 3    | 2     | 2     | 3     | -     | -     | -     |

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVES:
To enable the students to learn about the constructional details of fabrics, evaluation of fabric properties and their importance.

UNIT I CONSTRUCTION CHARACTERISTICS
Basic fabric particulars; determination of end and pick density, warp and weft count, thickness, areal density, crimp, cover factor; fabric sampling techniques; testing standards.

UNIT II STRENGTH CHARACTERISTICS
Principles of testing; determination of tensile strength, tear strength, bursting strength, seam strength; testing standards.

UNIT III COMFORT AND SURFACE CHARACTERISTICS
Measurement of moisture and thermal characteristics; principles of measurements - flexural rigidity, drapeability, crease recovery, wrinkle recovery, air permeability, fabric shrinkage, skew, bow, fabric abrasion resistance, pilling resistance; testing standards.

UNIT IV SPECIAL CHARACTERISTICS
Low stress mechanical properties - KES, FAST; flame resistance and water repellence.

UNIT V GARMENT QUALITY EVALUATION
Fabric inspection - different systems; classification of fabric defects; quality assessment of garments - cutting, sewing, pressing and finishing; seam puckering, delamination, button pulling, testing of sewing threads.

TOTAL: 30 PERIODS

LIST OF EXPERIMENTS
Determination of following characteristics of fabrics:

1. Tensile strength
2. Bursting strength
3. Tear strength
4. Flexural rigidity and bending modulus
5. Drapability
6. Crease recovery
7. Wrinkle recovery
8. Abrasion resistance
9. Pilling resistance
10. Air permeability
11. Button pulling test
12. Delamination test
13. Testing of sewing threads, interlining and buttons
14. Seam strength and seam slippage
OUTCOMES:
Upon completion of this course, the students would be able to understand the
CO1 - Constructional parameters of fabrics
CO2 - Principle of fabric strength testing
CO3 - Measuring of surface characteristics fabrics
CO4 - Low Stress Mechanical and special characteristics of fabrics
CO5 - Garment Quality Evaluation
CO6 - Testing of fabric properties

TOTAL : 30 PERIODS

TEXTBOOKS

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<td>CO1</td>
<td>Constructional parameters of fabrics</td>
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<tr>
<td>CO2</td>
<td>Principle of fabric strength testing</td>
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<td>CO3</td>
<td>Measuring of surface characteristics fabrics</td>
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<tr>
<td>CO4</td>
<td>Fabric low stress mechanical and special characteristics of fabrics</td>
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<td>CO5</td>
<td>Garment quality evaluation</td>
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<td>CO6</td>
<td>Experimental study on the fabric properties</td>
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</tbody>
</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:

- To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.
- To facilitate the understanding of global and Indian scenario of renewable and non-renewable resources, causes of their degradation and measures to preserve them.
- To familiarize the influence of societal use of resources on the environment and introduce the legal provisions, National and International laws and conventions for environmental protection.
- To inculcate the effect of population dynamics on human and environmental health and inform about human right, value education and role of technology in monitoring human and environmental issues.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14
Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – bio geographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity. Field study of common plants, insects, birds Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 8
Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides. Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES 10
Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land 47 degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles. Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.
UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT


UNIT V HUMAN POPULATION AND THE ENVIRONMENT


TOTAL: 45 PERIODS

OUTCOMES:
- To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
- To identify the causes, effects and environmental pollution and natural disasters and contribute to the preventive measures in the immediate society.
- To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
- To recognize different forms of energy and apply them for suitable applications in for technological advancement and societal development.
- To demonstrate the knowledge of societal activity on the long and short term environmental issues and abide by the legal provisions, National and International laws and conventions in professional and personal activities and to identify and analyse effect of population dynamics on human value education, consumerism and role of technology in environmental issues.

TEXT BOOKS:

REFERENCE BOOKS:
<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>PO1</th>
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<th>PSO 1</th>
<th>PSO 2</th>
<th>PSO 3</th>
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<td>To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.</td>
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<td>CO2</td>
<td>To identify the causes, effects and environmental pollution and natural disasters and contribute to the preventive measures in the immediate society.</td>
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<td>CO3</td>
<td>To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.</td>
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<td>CO4</td>
<td>To recognize different forms of energy and apply them for suitable applications in for technological advancement and</td>
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<tr>
<td>CO5</td>
<td>To demonstrate the knowledge of societal activity on the long and short term environmental issues and abide by the legal provisions, National and International laws and conventions in professional and personal activities and to identify and analyse the effect of population dynamics on human value education, consumerism and role of technology in environmental issues</td>
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</table>

**Overall CO**

| - | - | - | 3 | - | 2 | 2 | 3 | 3 | - | - | - | - | - | - | 3 |

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVES:
To practically train the students in fashion drawing and fashion illustration techniques

LIST OF EXPERIMENTS:
1. Experimenting with solids - Men’s, women’s and children’s
2. Experimenting with stripes - Men’s, women’s and children’s
3. Experimenting with checks and plaids - Men’s, women’s and children’s
4. Experimenting with florals and prints - Men’s, women’s and children’s
5. Experimenting with colour wheel and value scale
6. Experimenting with monochromatic, complementary, analogous and triadic colours
7. Experimenting with Texture rendering

TOTAL: 60 PERIODS

OUTCOMES:
Upon completion of this practical course, the students can
CO1 - Design men’s, women’s and children’s dresses with solids, stripes and checks
CO2 - Design men’s, women’s and children’s dresses with florals and prints
CO3 - Develop colour wheel and value scale
CO4 - Experiment with various colour harmonies
CO5 - Design using texture rendering
## Course Articulation Matrix:

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>PO1</th>
<th>PO2</th>
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<th>PO6</th>
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<th>PO11</th>
<th>PSO1</th>
<th>PSO2</th>
<th>PSO3</th>
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<tbody>
<tr>
<td>CO1</td>
<td>Design men’s, women’s and children dresses with solids, stripes and checks</td>
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<td>CO2</td>
<td>Design men’s, women’s and children dresses with florals and prints</td>
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<td>CO3</td>
<td>Develop colour wheel and value scale</td>
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<td>Experiment with various colour harmonies</td>
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<tr>
<td>CO5</td>
<td>Design using texture rendering</td>
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</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES
To train the students on construction of different types of garments

LIST OF EXPERIMENTS
1. Construct a men’s formal shirt
2. Construct a men’s formal trouser
3. Construct a women’s skirt – any one variation
4. Construct a saree blouse
5. Construct a salwar kameez
6. Construct basic baby set
7. Construct a children’s romper
8. Construct a children’s frock

TOTAL: 60 PERIODS

OUTCOMES:
Upon completion of this practical course, the students can be able to
   CO1 - Construct men’s formal shirt and trouser
   CO2 - Construct women’s skirt and blouse
   CO3 - Construct women’s salwarkameez
   CO4 - Construct basic baby set
   CO5 - Construct children’s romper and frock
<table>
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<tr>
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</tr>
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<td>CO1</td>
<td>Construct men’s formal shirt and trouser</td>
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<tr>
<td>CO2</td>
<td>Construct women’s skirt and blouse</td>
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<tr>
<td>CO3</td>
<td>Construct women’s salwar kameez</td>
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<tr>
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<td>CO5</td>
<td>Construct children’s romper and frock</td>
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<td>2</td>
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</tbody>
</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
To enable the students to understand
- Basics of financial management those are required for the textile industry
- Determination of cost of yarn, fabric and garment

UNIT I
Costing - concepts; costing types; different methods of costing, standard costing, analysis of variance; classification of costs; preparation of cost sheet; cost profit volume analysis, breakeven analysis

UNIT II
Costing of yarn, fabrics and garments; tax structure

UNIT III
Techniques of investment analysis – payback period method, accounting rate of return, Discounted Cash Flow methods - IRR, NPV, PI; Depreciation – method of computing depreciation

UNIT IV
Capital structure; sources and cost of capital; working capital management; Budget, types of budgets, budgeting and control in textile industry

UNIT V
Tools for financial analysis and control- profit and loss account, balance sheet; financial ratio analysis - illustrations from textile industry

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students shall be able to
CO1: Understand types and methods of costing, and preparation of cost sheet
CO2: Determine the cost of yarn, fabrics and garments
CO3: Carryout invest appraisal and calculate depreciation
CO4: Understand different sources and cost of capital, and preparation of budget
CO5: Analyze and interpret the financial statements of textile company

TEXTBOOKS:

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<td>Determine the cost of yarn, fabrics and garments</td>
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<td>Carry out invest appraisal and calculate depreciation</td>
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<td>Understand different sources and cost of capital, and preparation of budget</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
- To enable the students to understand the production planning in garment industry
- To emphasis on the improved methods of material control in apparel production
- To acquaint students with quality concepts for implementing quality in apparel production

UNIT I
Process control parameters in garment manufacturing, concepts of concurrent engineering, reverse engineering of standard garments, production planning and time and action calendar, sampling stages, steps between prototypes to production, product data management and understanding specification sheets

UNIT II
Operation break down and production sequence, line balancing, identification of bottle necks and critical operations, operation wise machinery allocation – basic shirts, trousers, skirts; usage of special attachments and tools for operation simplifications, production grid and flow chart

UNIT III
Basic principles of the lay planning process; automation of lay planning process and cutting room operations; influence of fabric design on marker making process, marker utilization, bundle distributions, modern methods in cut piece distribution and tracking

UNIT IV
Material management - Manufacturing Resources Planning (MRP), just in time production system (JIT), Optimised production technology (OPT), Economic order Quantity (EOQ), ABC, VED analysis in inventory control

UNIT V
Quality control in finishing and packing; packing - ratio packing, solid packing, short shipment, excess shipment, calculation of volumetric weight, carton and other packing requirements; concept of AQL

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students will be able to understand
- CO1: Process control in garment manufacture
- CO2: Production planning, line balancing
- CO3: Lay planning process
- CO4: Material management techniques and
- CO5: Quality control in garment manufacture

TEXTBOOKS:
REFERENCES:

Course Articulation Matrix:

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<td>Understand process control</td>
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<td>Lay planning</td>
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<td>CO4</td>
<td>Material management techniques</td>
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<td>Quality control in garment manufacture</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
- To enable the students to learn about human anthropometrics, sizing system and concepts of clothing fit and its evaluation.

UNIT I
Human anthropometrics-terms and definitions, traditional anthropometry, three dimensional methods, international standards, land marks, body measurement devices and techniques, body scanning and its applications.

UNIT II
Body shape analysis, classification of body shapes, characteristic differences among figures, posture – types, figure types- vertical, horizontal; sizing and shape requirements of children, male, female, elderly, maternity and intimate wears, clothing style selection for figure types, overcoming unrealistic body image.

UNIT III
Historical development of sizing system, international sizing, principles of sizing systems, methods of sizing for mass production of clothing for men and women; mass customization-sizing technologies and application.

UNIT IV
Fit-definition, influences on clothing fit, testing methods for dimensional fit, subjective rating scales and fitting guide, objective evaluation of clothing fit, analyzing poor fit – pattern alteration for fit and virtual garmenting.

UNIT V
Fit – work wear; sizing for military, garment drape – static, dynamic

TOTAL: 45 PERIODS

OUTCOMES:
- Upon the completion of the course the student shall be able to understand
  CO1: human anthropometrics and latest techniques in body measurement
  CO2: sizing for different body types
  CO3: various sizing systems
  CO4: concept of clothing fit, drape and pattern alterations
  CO5: evaluation of fit.

TEXTBOOKS:
REFERENCES:

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<td>Sizing for different body types</td>
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<td>Various sizing systems</td>
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<tr>
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<td>Concept of clothing fit, drape and pattern alterations</td>
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</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To enable the students, develop a portfolio and construct a garment for the identified theme.

LIST OF EXPERIMENTS
1. Develop different silhouettes
2. Design research and conceptualization for a given theme
3. Prepare a mood board for the given theme
4. Prepare an inspiration board for the given theme
5. Prepare a colour board for the given theme
6. Develop different sketches incorporating design elements for the given theme
7. Source appropriate fabric and trims and construct 3 garments for the given theme
   (men/women/children garment)

TOTAL: 60 PERIODS

OUTCOMES:
Upon completion of this practical course, the student shall be able to,
CO1: Develop silhouettes
CO2: Design concept for the theme
CO3: Develop mood board, inspiration board and colour board
CO4: Understand and source different fabric and trims and
CO5: Translate design into garment
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<td>Develop silhouettes</td>
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<td>Develop mood board, inspiration board and colour board</td>
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<td>Translate design into garment</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To train the students in CAD used for pattern making of garments and marker planning

LIST OF EXPERIMENTS
Use CAD software to develop
1. Basic Blocks for Men’s and Women (top and bottom)
2. Pattern for Men’s Formal shirt
3. Pattern for Men’s formal trouser (pleats and Flange)
4. Pattern for Women’s Tops (application of Dart manipulation principle)
5. Pattern for Women’s Bottoms (skirts, pants – Added fullness techniques Gatherings and pleats)
6. Patterns for children’s dresses (principles of contouring applied)
7. Patterns for dungaree and work wear
8. Patterns for close fitting body shapes
9. Graded patterns
10. Marker and optimize using digitizer
11. Reverse pattern engineering

TOTAL: 60 PERIODS

OUTCOMES:
Upon completion of the course, the student will have practical experience, in using pattern making software
CO1: Basic block patterns for different wears,
CO2: Grading
CO3: Marker planning
CO4: Marker optimization
CO5: Reverse pattern engineering
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</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
To enable the students to learn about basics of industrial engineering and different tools of industrial engineering and its application in apparel industry

UNIT I
Industrial Engineering - evolution, functions, role of industrial engineer, productivity concepts, causes for low productivity in apparel industry, suggestions for productivity improvement; basic work content, added work content, reduction of work content and ineffective time, work study- introduction and procedure.

UNIT II
Methods study – introduction, approach to method study; techniques of recording; method analysis techniques; method study in garment manufacture

UNIT III
Motion analysis, principles of motion economy, micro motion analysis – SIMO Chart; work measurement, time study – equipment and procedure, rating concepts

UNIT IV
Work sampling techniques; work measurement applied to garment industry; Standard data- PMTS, GSD, calculation of standard allowance minutes (SAM), incentive wage system

UNIT V
Ergonomics - importance, division; ergonomic principles - designing of workplace, working processes, handling material, tools and environment; ergonomic conditions - lighting, ventilation, climatic condition – temperature control, humidity control, noise control, safety measures in garment industry; site selection for garment industry; plant layout - types of layouts suitable for garment industry, methods to construct layout

TOTAL: 45 PERIODS

OUTCOMES:
- Upon the completion of the course the student shall be able to understand
  - CO1: Productivity concepts
  - CO2: Method study
  - CO3: Motion analysis
  - CO4: Work measurement
  - CO5: Ergonomics applied to garment industry

TEXTBOOKS:
REFERENCES
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To acquaint the students with the concepts of business, design merchandising, sourcing and export documentation

UNIT I INTRODUCTION TO APPAREL BUSINESS
Apparel business practices; business operations in Asian countries; business practices of Indian apparel export and retail houses

UNIT II MARKETING FOR APPAREL AND TEXTILE PRODUCTS
Marketing for the 21st century, core concepts and orientation towards market place, strategies and planning, market research and forecast, customers, consumer markets and business markets, market segments and brand building, brand positioning and competition, programmatic marketing; digital and autonomous interventions, conversational interfaces - Artificial intelligence chat bots

UNIT III DESIGN MERCHANDISING
Concepts of merchandising, apparel product lines, dimensions of product change, determination and development of product line and product range; creative design of garments and accessories, new product development and seasons of sale, costing, coordination and communication with the production house and export house

UNIT IV SOURCING
Understanding the basics of sourcing, sourcing strategy and best sourcing practice in apparel and textile businesses, supply chain and demand chain, sourcing negotiations, global co-ordination in sourcing, materials management and quality in sourcing, quick response, ERP, supplier partnership in sourcing, JIT technology, made to fit.

UNIT V EXPORT DOCUMENTATION AND POLICIES
Government policies, guide lines for apparel export and domestic trade, tax structures and government incentives in apparel trade; export documents and its purposes, banking activities, Letter of credit, logistics and shipping, foreign exchange regulation, export risk management and insurance; export finance, Special economic zones.

TOTAL: 45 PERIODS

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

CO1: Understanding the international apparel business and roll of Asian countries in the apparel and fashion trade
CO2: Applying the concepts of marketing and merchandizing in the apparel industry in the world and India.
CO3: Understand the apparel product dynamics in a market and relating it along the value chain.
CO4: Applying the concepts of sourcing in the apparel industry, with respect to modern business practices.
CO5: Understand the apparel export and import, requirements for international operations.
TEXTBOOKS


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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVES:

To enable the students to understand different types of apparel accessories used in the garment manufacture and embroidery of garments

UNIT I

Garment components and trimmings – labels and motifs, linings, interlining wadding, lace, braid and elastic, seam binding and tape, shoulder pads, eyelets and laces, zip fasteners, buttons – tack buttons, snap fastener and rivets; buckles, frag closures, belts, ribbons, fringe, emblems and sequins, decorative and functional trimmings; performance properties of components and trims.

UNIT II

Hook and loop fastening (Velcro), Zippers – anatomy of zipper, types, function of zipper, position of slider, standards on zipper, selection of zipper, application of zipper, shortening of zipper; evaluation of quality of accessories

UNIT III

Embroideries - basic embroidery stitches – chain stitch, button hole stitch, herringbone stitch, feather stitch, lazy daisy, double knot stitch, interlacing stitch, stem stitch, French knot stitch; types of embroidery machines; Kasuti, Kasida, Kathiawar, Sindhi, Phulkari, Chikankari, Aari and Zardosi and tribal embroideries

UNIT IV

Fashion accessories – footwear, handbags, gloves, hats, scarves, hosiery, jewelry, watches; testing of zippers, elastic waist band testing, fusible interlinings; safety issues for different accessories in children garment.

UNIT V

Printing – introduction; different methods – block printing, roller, screen, discharge, resist and pigment; styles of printing - batik, tie and dye, patch work, appliqué work, bead work

TOTAL: 30 PERIODS

Practical:

1. Embroideries - basic embroidery stitches, Aari work
2. Printing - block printing, batik, tie and dye
3. Patch work, appliqué work, bead work
OUTCOMES:

Upon completion of this course, the students shall
   CO1 –Know different types of garment components and trims
   CO2 –Know differently types of Zippers
   CO3 –Know Embroideries - Indian and tribal
   CO4 –Know about Fashion accessories
   CO5 –Know about Different types of printing
   CO6 - Have hands on experience on embroideries, printing and special works in garments

TEXTBOOKS:


REFERENCES:

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<td>Hand on experience on embroideries, printing and special works in garments</td>
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</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES
To enable the students to learn about
- Various kinds of materials used as home textiles
- Recent developments in home furnishing, floor covering and other home textile products
- Finishes and Evaluation required for home textiles.

UNIT I INTRODUCTION
Concepts of Home textiles and its market scenario, consumer expectation from home textiles; fibers and fabrics used - Woven, nonwoven and knits; manufacturing concepts- damask, brocade, organdie, chiffon, oxford, tapestry

UNIT II HOME FURNISHING
Living room furnishings – types, fabric selection and design concepts; bed room furnishings- types, fabric selection and design concepts; advances in the production of different types of bed linen, bed sheets, blankets, blanket covers, comforters, comfort covers, bed spreads, mattress and mattress covers, pads, pillows; kitchen furnishing - fabric selection and finishing for dish cloth, hand towels, aprons, mittens and runners

UNIT III FLOOR COVERING AND DRAPES
Recent developments in manufacturing of floor coverings - hard floor coverings, resilient floor coverings; soft floor coverings – carpets and rugs, laying procedure, maintenance and care; cushion and pads; factors affecting the selection of floor covering; advances in home decoration -draperies – choice of fabrics ,curtains, finishing of draperies- tucks and pleats; types of drapery rods, hooks, tape rings and pins.

UNIT IV FINISHES USED IN HOME TEXTILES
Introduction, thermal draperies, protection against unpleasant odour, antimicrobial finish, moisture management finish, flame retardant finish, towel finishing;sensory perception technology; insect and mite repellent finish, antistatic finish; temperature regulated beddings

UNIT V EVALUATION OF HOME TEXTILES
Test methods - towels, rugs; flammability standards for curtains, test methods for pot holders and woven mittens; labelling and care instructions of home textiles

OUTCOMES:
Upon completion of this course, the student shall be able to understand
CO 1 - Different types of materials used as home textiles
CO 2 - Selection of fabric and design for living room, bed room and kitchen furnishings
CO 3 - Selection of floor coverings and draperies
CO 4 - Finishes used for various home textile products
CO 5 - Evaluation of home textile products

TEXTBOOKS:
REFERENCES:

# Course Articulation Matrix:

<table>
<thead>
<tr>
<th>Course Outcomes</th>
<th>Statement</th>
<th>Program Outcome</th>
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<td>CO4</td>
<td>Finishes used for various home textile products</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To acquaint students on the design, material, accessories and sewing aspects of intimate garments

UNIT I MATERIAL
Intimate apparels – classification; materials-fibre, fabric, accessories and finishes; physical and physiological requirements of intimate apparels

UNIT II MEN’S INTIMATE APPAREL
Design analysis, measurements, pattern drafting of men’s intimate apparel – long johns, tank top, basic shorts, knickers, bikini underwear, thong, briefs, boxer shorts and jock strap.

UNIT III WOMEN’S INTIMATE APPAREL
Design analysis, measurements, pattern drafting of women’s intimate apparel – petticoats, panties, camisoles, tube top, shape wear, bikini and brassier – seamless, half cup and full cup bra.

UNIT IV INTIMATE APPAREL MANUFACTURE I
Intimate apparel accessories - Bra wire, hook and eye tape, ring and slider, buckle, plastic bone, elastics and sewing threads

UNIT V INTIMATE APPAREL MANUFACTURE II
Sewing of intimate apparels - seams, stitches, machines; lamination; moulding and ultrasonic welding technique

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students will have the skills essential to
CO1 - Select fibres and fabric for intimates
CO2 - Design and draft pattern for men’s intimate apparel
CO3 - Design and draft pattern for women’s intimate apparel
CO4 - Select required accessories
CO5 - Know about seams, stitches and seamless technology to develop intimates

TEXTBOOKS:

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<th>Course Outcomes</th>
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</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To enable the students to understand the fashion business segments, retail management concepts and acquaint the students with fashion communication tools

UNIT APPAREL RETAIL BUSINESS SCENARIO
Retailing, current global and Indian retail scenario in garment and fashion, key drivers of Indian apparel retail business, growth of organized apparel retail in India; understanding the Indian retail economics, foreign direct investment in Indian apparel retail.

UNIT II RETAIL MANAGEMENT STRATEGIES
Operational excellence, customer service strategies, pricing strategies, inventory levels and merchandise availability as a strategy, case studies on Indian and International retail stores, retail business formats, retail management information system

UNIT III RETAIL MANAGEMENT DESIGN
Objectives of store planning, location, design, retail image mix, layout plan for retail stores. Buying, mark-up and mark-down in merchandise management, private labels; apparel franchising- types, Key success factors

UNIT IV VISUAL MERCHANDIZING
Visual merchandising as a communication tool, presentations in visual merchandising, visual merchandising and enhanced customer buying decision, interiors with respect to brand, sensory elements, signs and graphics, focal point for season and type of sale; case studies on visual merchandising, neuro marketing, augmented reality and recent trends – interactive merchandizing

UNIT V E-RETAILING
An introduction to fashion e-commerce, apparel and fashion e-business, s-commerce vs. e-business, economic forces – advantages – myths – e-business models, design, develop and management of e-business, web and social networking, mobile commerce - business applications, classifications, and models, payments, security and legal requirements; recent trends – behaviour tracking

OUTCOMES:
Upon completion of the course, the student shall know the
CO 1 - Concept of retail management
CO 2 - Retail management strategies
CO 3 - Design of retail management
CO 4 - Concept of visual merchandizing
CO 5 - e-commerce, s-commerce

TEXTBOOKS:

REFERENCES:
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To enable the students, to learn the techniques of draping different body forms.

LIST OF EXPERIMENTS
1) Detailed measurement of dress forms
2) Preparation of Muslin for draping - Basic patterns - Front, Back, Skirt and Sleeves
3) Front Bodice with underarm - Dart, Back Bodice with neckline dart.
4) Dart variations, Pleats, Dart tucks and Gathers
5) Variations of basic skirt - One piece, Tapered, Dome, Gored and Flared
6) Male body form draping – (traditional and party wear)
7) Female body form draping- (traditional and party wear)
8) Children body form draping- (party wear)

TOTAL: 90 PERIODS

OUTCOMES:
Upon completion of this practical course, the student shall carryout

CO1: basic measurements of dress form
CO2: Muslin preparation
CO3: Dart techniques
CO4: Skirt draping
CO5: Traditional and party wear draping
### Course Articulation Matrix:

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</table>

1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To enable the students to understand the functional, mechanical, denim, unconventional finishes of fabrics and garment care.

UNIT I FUNCTIONAL FINISHING I
Objectives, types, selection of chemicals with reference to type of fabrics, process conditions and types of fibres; chemical finishing methods: application & assessment of water repellent/proof, flame retardant, heat resistant, mildew proof, moth proof, anti-static, soil release

UNIT II FUNCTIONAL FINISHING II
Chemical finishing methods: application & assessment of UV protection, anti-microbial, odor control, fragrance and elastomeric finishes(without compaction), resin finishing: durable press, wash-n-wear, wrinkle free, silicone finishing.

UNIT III MECHANICAL FINISHING
Peach finish, raising, calendaring: swissing, embossing, schreinering, friction calendaring & moiré effect.

UNIT IV DENIM FINISHING AND UNCONVENTIONAL FINISHING
Process conditions, machineries, chemicals used for various special effects- pumice stones, acid and enzyme wash, bio-polishing & bio-stoning, sand blasting, ozone and laser fading

UNIT V GARMENT CARE
Plasma treatment, finishing using micro capsules, nano and electro chemical treatment of textile materials; types and characteristics of stains, identification of stains, selection of stain removers, methods of stain removal, methods of washing, industrial washing machineries, application of soaps, detergents, bleaches, optical whiteners, stiffeners, softeners, dry cleaning agents for different fabrics; laundering procedures and care instructions adopted for cellulosic, protein and synthetic materials, storage of household linen and apparel laundries, care labeling

OUTCOMES:
Upon completion of this course, the student shall have the knowledge of

CO1 - Finishing of fabrics for waterproof, flame retardant, heat resistant, mildew proof, moth proof, anti-static, soil release
CO2 - Finishing of fabrics for UV protection, anti-microbial, odor control, fragrance, durable press, wash-n-wear, wrinkle free and silicone finishing
CO3 - Mechanical finishing of fabrics
CO4 - Denim and unconventional finishing of fabrics
CO5 - Garment care

Total: 45 PERIODS

TEXTBOOKS:

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<tr>
<td>CO1</td>
<td>Finishing of fabrics for waterproof, flame retardant, heat resistant, mildew proof, moth proof, anti-static, soil release</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OB{OBJECTIVE}
To enable the students understand about the Enterprise Resource Planning software and its modules

List of experiments
Practice on data entry, report generation in Enterprise Resource Planning software
1. Costing, order booking, MRP, purchase, production planning, production orders, inventory control, packing, shipping, scheduling, sample preparation and approval, business reports
2. ERP in apparel production – time study, cutting, production tracking, cut panel process, garment quality control, order completion, machine repairs and maintenance, reports
3. ERP in retail management – style template, finished goods barcoding, stock taking, stock inward, retail order booking, stock allocation, scan and pack, dispatch, invoice, point of sale, reports

TOTAL: 90 PERIODS

OUTCOMES:
Upon the completion of this course the students shall be able to practically carry out

CO1: Data entry in ERP software

CO2: Report generation using ERP software
<table>
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<tr>
<th>Course Outcomes</th>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE
To train the students in designing of garments using Adobe Photoshop, Adobe Illustrator/Corel Draw

LIST OF EXPERIMENTS

1. Practice on tools and features in Adobe Photoshop
2. Practice on tools and features in Adobe Illustrator/Corel Draw
3. Creating a woven and print design using Adobe Photoshop
4. Creating a digital mood board and a color board based on a theme
5. Preparation of digital designs for children’s wear and accessories
6. Preparation of digital designs for women’s wear and accessories
7. Preparation of digital designs for men’s wear and accessories

TOTAL :90 PERIODS

OUTCOMES:
- Upon completion of the course, the student will have practical experience in
  CO1: Tools and features in designing Software
  CO2: Making digital print designs using software.
  CO3: Making digital mood board and colourboard using software
  CO4: Making digital designs for children’s wear using software
  CO5: Making digital designs for men’s and women’s wear using software
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High)
OBJECTIVES:
To enable the students to understand the requirements and production of sewing threads for different applications

UNIT I            13
Sewing threads – property requirements for different applications; ticket numbering; characterization of sewing threads- stress–strain behaviour of sewing threads; thermal, friction behaviour of sewing threads; sewability of the thread, seam efficiency index

UNIT II           13
Types of sewing thread – spun threads, core spun threads, filament threads; production, properties and applications

UNIT III          5
Yarn folding, fancy yarns – types and production; metallic yarns

UNIT IV          9
Characteristics and application of high performance sewing threads - aramid threads, ceramic threads, polypropylene threads, polyethylene threads, polytetrafluoroethylene threads, fibreglass threads, other sewing threads – tencel, acrylic, linen, elastic, soluble; embroidery threads

UNIT V           5
Physical testing of sewing threads, sewing defects related to sewing threads – assessment and control

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to understand the

CO1 Production of sewing thread
CO2 Characterization of sewing thread and
CO3 Selection of sewing thread for different end uses
CO4 Testing of sewing thread
CO5 Manufacturing of fancy yarns

TEXTBOOKS:

REFERENCES:
# Course Articulation Matrix

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
Objective:
To enable the students understand the concept and construction of smart and protective fabrics, intelligent textiles and interactive garments

UNIT I SMART TEXTILES I
Introduction, electrically active polymers materials- application of non-ionic polymer gel and elastomers for artificial muscles; Heat storage and thermo regulated textiles and clothing, thermally sensitive materials, Smart textile composites integrated with optic sensors.

UNIT II SMART TEXTILES II
Smart fabrics – passive, active, very smart – classification of smart materials, concept of wearable computing, basic structure of fabric used for integrating different electronic sensors

UNIT III PROTECTIVE TEXTILE FOR BALLISTIC APPLICATION
Ballistic protective textiles- types and application, mechanism of ballistic protective textiles; design and manufacture of ballistic protective textile; designing of body armour; testing and evaluation

UNIT IV PROTECTIVE TEXTILE FOR CHEMICAL AND THERMAL PROTECTION
Clothing requirements for chemical and thermal protection; designing of fibre, yarn and fabrics for chemical and thermal protection; functional finishes for chemical and thermal protection; testing and evaluation

UNIT V PROTECTIVE TEXTILE FOR MEDICAL AND RADIATION PROTECTION
Medical protective textiles – classification, clothing requirements, types of fibre, yarn, fabrics and finishes; testing and evaluation; radiation protective textile- types of radiation and its hazards, mechanism of radiation protection, designing textiles for radiation protection, testing and evaluation of radiation protective textiles

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the students shall have the knowledge on
CO1 Technologies used in smart textiles
CO2 Wearable electronics and smart interactive garments
CO3 Materials, construction and testing methods of ballistic protective garments
CO4 Chemical and thermal protective garments
CO5 Clothing requirement and design concepts of medical and radiation protective textiles

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
To enable the students to learn about the
- Fundamentals of bonded fabrics
- Different method of web formation and bonding

UNIT I WEB FORMATION
Definitions and classification of bonded fabrics; web formation – dry and wet method of production, fibre requirements; web laying – types, influence on web structure and nonwoven properties; quality control of web

UNIT II MECHANICAL BONDING
Bonded fabric production by mechanical bonding - needling, stitching, water-jet consolidation; factors influencing the properties; applications

UNIT III CHEMICAL AND THERMAL BONDING
Chemical bonding – binder polymers and bonding technologies; thermal bonding technologies; factors influencing the properties; applications

UNIT IV POLYMER–LAID WEB AND FABRIC FORMATION
Manufacture of spun bonded fabrics, fibre orientation in spun bonded fabrics and characterization of filament arrangement; manufacture of melt blown fabrics – fibre formation and attenuation; effect of processing parameters on fabric characteristics; applications

UNIT V FINISHING AND CHARACTERIZATION OF BONDED FABRICS
Dry and wet finishing; characterization – tensile, tear, bursting, thickness, abrasion, puncture, permeability, porosity; safety measures to be taken at the nonwoven industry

OUTCOMES:
Upon completion of the course the student will be able to understand the
- CO1: Basics of nonwoven web formation techniques
- CO2: Mechanical bonding technique to produce nonwovens
- CO3: Chemical and thermal bonding methods to produce nonwovens and their end uses
- CO4: Production of spun bonded and melt blown nonwoven fabrics.
- CO5: Understand the finishing and characterization of bonded fabrics

TOTAL: 45 PERIODS

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVES:
To enable the students to learn about the
- Important characteristics of the fabric responsible for its comfort properties and
- Different phenomena which take place in the fabric related to the comfort properties of the fabric

UNIT I
9
Comfort – types and definition; human clothing system, comfort perception and preferences

UNIT II
9
Psychological comfort; neuro-physiological comfort-basis of sensory perceptions; measurement techniques - mechanical stimuli and thermal stimuli

UNIT III
9
Thermo physiological comfort – thermoregulatory mechanisms of the human body, role of clothing on thermal regulations

UNIT IV
9
Heat and moisture transfer – moisture exchange, wearer’s temperature regulations, effect of physical properties of fibres, behaviour of different types of fabrics

UNIT V
9
Fabric tactile and mechanical properties - fabric prickliness, itchiness, stiffness, softness, smoothness, roughness, and scratchiness; predictability of clothing comfort performance

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student shall be able to understand
- CO1: Different phenomena in comfort of fabric
- CO2: Physiological comfort with respect to clothing
- CO3: Thermo physiological comfort requirements of human and the role of clothing
- CO4: Correlate the behavior of different fabric in relation to heat and moisture transfer
- CO5: Correlate the property of the fabric with comfort to the wearer

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVE:
To enable students to learn about application of statistical tools in garment industry

UNIT I HYPOTHESIS TESTING 6
Testing of hypothesis – z, t, F, chi square, p values relevant to garment industry

UNIT II ANALYSIS OF VARIANCE AND NON PARAMETRIC TESTS 6
ANOVA of different models; non parametric tests relevant to garment industry

UNIT III CONTROL CHARTS 6
Construction of control charts and interpretation – illustrations from garment industry

UNIT IV DESIGN OF EXPERIMENTS 6
$2^k$ full factorial design; Box-Behnken design; response surface methodology; construction of experiments related to garment industry and interpretation of results

UNIT V APPAREL APPLICATIONS 6
Balancing of machinery, costing of fabric and garment, budgeting for garment manufacturing unit

TOTAL:30 PERIODS

LAB EXPERIMENTS:
Conducting following experiments using software
- Mean, standard deviation, Z test, T test, Chi square test, ANOVA test
- Construction of control charts
- Developing Response surface methodology graphs and interpretation
- Balancing of machinery
- Costing of fabrics
- Costing of apparels
- Preparation of budget for apparel unit

TOTAL:30 PERIODS

OUTCOMES:
Upon completion of this course, the student shall be able to
- CO1: Understand the probability distribution
- CO2: Use the hypothesis testing for acceptance sampling
- CO3: Use the variance and nonparametric tests
- CO4: Use of control charts for understanding the process
- CO5: Design the experiment, conduct statistical tests and analyse the results to arrive at the conclusion.

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To introduce the students the concept of brand, brand building, branding strategies and legal issues in brand management

UNIT I
Product – definition, types; product line, product mix; new product development; estimating market and sales potential, sales forecasting

UNIT II
Brand – definition, evolution, importance; product vs. brand; terminologies used in branding; branding – creation, challenges, understanding consumer, competition, components; brand identity – brand naming, logos, characters, slogans, tools to maintain identity, illustrations from apparel industry

UNIT III
Brand Building: brand insistence model; advertising – definition, objectives, modes, economic and ethics; non-traditional marketing approach

UNIT IV
Branding strategies; brand extension, brand revitalization, brand repositioning, brand recall, brand elimination, brand imitation

UNIT V
Brand equity measurement systems; legal issues in brand management; global branding

OUTCOMES:
On completion of this course, the students would have the knowledge on

CO1 Product mix, sales forecasting
CO2 Basics of branding and terminologies used
CO3 Brand building
CO4 Different branding strategies and effective formulation of strategies
CO5 Legal issues related to brand management and global branding

TEXTBOOKS

REFERENCE
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
To enable the students to learn about
- Various operations research (OR) methods that can be applied in the textile industry
- Expressing of problems arising in the textile industry in appropriate Operations Research formats
- Methods of solving such Operations Research problems

UNIT I
Introduction – History of Operations Research, Scope of Operation Research, applications and limitations; Linear programming problem – construction, solution by graphical method, the Simplex method and its extension by the Big M method; integer programming – introduction; application of the LP technique in the field of Textile technology

UNIT II
Transportation problem – construction, initial basic feasible solution – North West Corner rule, lowest cost entry method, Vogel's Approximation Method; the optimality test - MODI method, stepping stone method; transshipment problem

UNIT III
The Assignment problem – construction, solution by Hungarian method, application in the textile industry; sequencing problems; Decisions theory - decisions under assumed certainty, decision under risk, decision under uncertainty, illustrations from textile industry

UNIT IV
Replacement analysis; inventory control – ABC, VED analysis, EOQ – application in textile industry, simulation-introduction, Monte Carlo method

UNIT V
Project planning and control models: CPM, PERT – network representation, determining critical path, project duration; crashing of project duration; resource levelling

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- CO1: Design Operations Research problems from the cases arising in the Textile Industry and determine solution for linear programming problems
- CO2: Construct and solve transportation problems
- CO3: Construct and solve assignment problems and understand decision making under different conditions.
- CO4: Carryout replacement analysis and inventory control
- CO5: Construct and solve project scheduling and leveling by PERT and CPM techniques

TEXTBOOKS:

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<td>Construct and solve assignment problems and understand decision making under different conditions.</td>
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<td>Carryout replacement analysis and inventory control</td>
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<td>Construct and solve project scheduling and leveling by PERT and CPM techniques</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively
OBJECTIVES:
- To provide an insight on the fundamentals of supply chain networks, tools and techniques.
- To train the students to new and recent developments in supply chains, e-business and information technology

UNIT I
Basic principles of supply chain management and logistics, supply chain models, supply chain for volatile market; supply chain drivers and metrics in apparel industries; roll of supply chain in the textile and apparel industries’ financial stability.

UNIT II
Planning supply and demand in apparel production house, managing economies of scale, supply cycle and inventory levels; managing uncertainty in supply chain, safety pricing and inventory; make vs buy decision, make vs hire decision; geographical identification of suppliers, supplier evaluation, supplier selection, contract negotiations and finalization.

UNIT III
Distribution network and design for global textile and apparel products, models of distribution – facility location and allocation of capacity, uncertainty on design and network optimization; the role of transportation in supply chain, modes of transportation, characteristics of transportation, transport design options for global textile and apparel network, trade-off in transport design, risk management in transportation, transport decision in practice for textile and apparel industries.

UNIT IV
Coordination in supply chain- the bullwhip effect, forecasting, obstacles to coordination in supply chain; supply chain management for apparel retail stores, high fashion fad; supply chain in e-business and b2b practices

UNIT V
Import - export management, documentation, insurance, packing and foreign exchange; methods of payments – domestic, international, commercial terms; dispute handling modes and channels; supply chain and Information system; customer relationship management

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student shall have the
CO1 Knowledge of the framework and
CO2 Knowledge on scope of supply chain networks and
CO3 Knowledge on its functions in the industry
CO4 Capacity to develop clear, concise and organized approach to operations management
CO5 Basic knowledge on the shipment procedure

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE:
To give the students an exposure on international market for textile products, regulations
with respect to export and import of textiles

UNIT I
International markets for yarns, woven fabrics; international market for cotton, silk, jute, wool and
other fibres; export and import of textiles by India – current status, promotional activities

UNIT II
International markets for carpets and home textiles – product types, market potential and statistics,
India - current status and promotional activities, role of export promotional councils

UNIT III
International markets for woven piece goods, knitted garments, leather garments; statistics of
international apparel market and trade; export incentives, role of AEPC, CII, FIEO, Textile
Committee

UNIT IV
Marketing – strategies, global brand building; logistics & SCM; role of export finances & EXIM
banking, ECGC, Indian council of arbitration, FEMA; impact of foreign trade on Indian economy

UNIT V
Exim policy - customs act, acts relating to export/import of textile and apparel; Indian customs
formalities - export documentation for excisable goods, import documentation, clearance of import
goods; concepts - 100% export oriented units, export processing zones, special economic zones;
duty drawback procedure; import/export incentives; licenses; case study

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of this course, the student shall have the knowledge on
CO1 Textile and apparel market
CO2 International market for home textiles and carpets
CO3 International market for woven, knitted and leather garments
CO4 Marketing strategies
CO5 global marketing strategies and EXIM policy and procedures

TEXTBOOKS:
8125909397 / ISBN: 978-8125909392
B00HYVS32K

REFERENCES:
0415817137 / ISBN : 978-0415817134
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVES:
- To enable the students to understand about total quality management, different TQM tools and techniques and Quality standards
- To train the students to apply TQM tools in textile industry

UNIT I  INTRODUCTION

UNIT II  TQM PRINCIPLES

UNIT III  TQM TOOLS & TECHNIQUES I

UNIT IV  LEAN MANUFACTURING, QUALITY SYSTEMS
Need for ISO 9000-ISO 9000-2000 quality system – elements, documentation, quality auditing; OHSAS 18000, ISO 14000 – concepts, requirements and benefits - quality council – leadership, employee involvement – motivation, empowerment, team and teamwork, recognition and reward; lean manufacturing – overview, principle, fundamental lean tools; waste – definition, types; waste management in apparel industry- identification and control; inventory control; kanban flow; flexible manufacturing concept

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
CO1: Understand the principle of TQM,
CO2: Differentiate different TQM tools and techniques
CO3: Develop innovative tools to implement TQM in the textile industry
CO4: Understand lean manufacturing system applied to textile industry

TEXTBOOKS:

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<tr>
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<td>Differentiate different TQM tools and techniques</td>
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<td>CO3</td>
<td>Develop innovative tools to implement TQM in the textile industry</td>
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<td>Understand lean manufacturing system</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE

- To enable the students to understand the importance of Entrepreneurship and the role of government in entrepreneurial development

Unit I
Entrepreneur— Introduction, characteristics of a successful entrepreneur, decision making process, functions, types, social entrepreneur

Unit II
Factors affecting entrepreneurship growth— economic and non-economic factors, government initiatives and policies, entrepreneurial motivation, and entrepreneurial competence

Unit III
Boutique—entrepreneur, boutique business, types; business plan— survey, selection of type of boutique, SWOC analysis; opportunities in embroidery, embellishments and accessories, printing, home textiles, commercial laundries

Unit IV
Preparing project proposal; management of initial investment; design of location and layout; infrastructure selection; line balancing and selection of machinery

Unit V
Organizational structure— manpower selection; developing standard operating procedure; sourcing of inventory and management; working capital management; legal approval, waste management

TOTAL: 45 PERIODS

OUTCOMES:
Upon the completion of this course the students shall be able to understand the
CO1—Basics of Entrepreneurship
CO2: Factors affecting Entrepreneurship growth and their problems
CO2 -
CO3: Boutique—SWOC analysis
CO3 -
CO4- Preparation of project proposal
CO5 - Legal aspects in entrepreneurship

TEXTBOOKS:
2. Satish Taneja, Entrepreneur Development ; New Venture Creation,2010

REFERENCES:
1. N.P.Srinivasan and G.P. Gupta —Entrepreneurial Development‖ Sultanchand and Sons.,2008
## Course Articulation Matrix:

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<td>The importance of Entrepreneurial Development programmes</td>
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<td>CO3</td>
<td>The projects identification, selection and formulation procedure</td>
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<td>Plant layout and line balancing</td>
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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
OBJECTIVE
To enable the students to understand various aspects of human resource management and different acts related to personnel management.

UNIT I
Human resource development systems - Indian society in transition, understanding the concepts of HRD past, present and future, strategies adopted, structure, objectives and working of the HRD system in India and abroad, role of HR managers in textile and apparel industries.

UNIT II
Human resource planning objectives of planning on the macro level, demand forecasting of HR planning, MIS in HR planning, future skill mapping, human resource outsourcing, recruitment and processes involved in textile and apparel industries, induction, training objectives, methods, carrier planning, performance, and potential appraisal.

UNIT III
Job analysis, description, evaluation, enrichment; performance measurement objectives, methods, multi-skill development, motivation; organized labour, understanding groups, development, cohesion, alienation, group work behaviour and managing international workforce.

UNIT IV
Compensation, wage policy, industrial pay-structure, types, components, laws and methods of payment; methods of wage fixation in textile mill and apparel units; laws governing employee benefits and welfare, incentives, overtime, bonus, cost to the company.

UNIT V
Different Acts governing labour welfare and employment; employee discipline - disciplinary actions, procedures, suspension, dismissal and retrenchment, role of trade unions, collective bargaining, industrial democracy and workers participation in management, related case studies.

TOTAL: 45 PERIODS

OUTCOMES:

CO 1 Upon completion of this course, the students shall be able to understand
CO 2 role of HR managers and HRD system in India
CO 3 recruitment and training in textile industry
CO 4 job analysis, managing organized labour and international labour
CO 5 compensation, wage policy
CO 6 government acts related to labour management

TEXTBOOKS:

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1, 2 and 3 are correlation levels with weightings as Slight (Low), Moderate (Medium) and Substantial (High) respectively.
AUDIT COURSES (AC)

AD5091                                          CONSTITUTION OF INDIA                                          L T P C

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OBJECTIVES:

- Teach history and philosophy of Indian Constitution.
- Describe the premises informing the twin themes of liberty and freedom from a civil rights perspective.
- Summarize powers and functions of Indian government.
- Explain emergency rule.
- Explain structure and functions of local administration.

UNIT I     INTRODUCTION                              9
History of Making of the Indian Constitution-Drafting Committee- (Composition & Working) - Philosophy of the Indian Constitution-Preamble-Salient Features

UNIT II    CONTOURS OF CONSTITUTIONAL RIGHTS & DUTIES 9

UNIT III   ORGANS OF GOVERNANCE                      9
Parliament-Composition-Qualifications and Disqualifications-Powers and Functions-Executive President-Governor-Council of Ministers-Judiciary, Appointment and Transfer of Judges, Qualifications Powers and Functions

UNIT IV    EMERGENCY PROVISIONS                      9

UNIT V     LOCAL ADMINISTRATION                     9
District’s Administration head- Role and Importance-Municipalities- Introduction- Mayor and role of Elected Representative-CEO of Municipal Corporation-Pachayati raj- Introduction- PRI- Zila Pachayat-Elected officials and their roles- CEO ZilaPachayat- Position and role-Block level-Organizational Hierarchy (Different departments)-Village level- Role of Elected and Appointed officials-Importance of grass root democracy

TOTAL: 45 PERIODS

OUTCOMES:

CO1: Able to understand history and philosophy of Indian Constitution.
CO2: Able to understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
CO3: Able to understand powers and functions of Indian government.
CO4: Able to understand emergency rule.
CO5: Able to understand structure and functions of local administration.

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TEXTBOOKS:

4. The Constitution of India (Bare Act), Government Publication,1950
AD5092

VALUE EDUCATION

OBJECTIVES:
- Develop knowledge of self-development
- Explain the importance of Human values
- Develop the overall personality through value education
- Overcome the self destructive habits with value education
- Interpret social empowerment with value education

UNIT I

INTRODUCTION TO VALUE EDUCATION
Values and self-development –Social values and individual attitudes, Work ethics, Indian vision of humanism, Moral and non- moral valuation, Standards and principles, Value judgements

UNIT II

IMPORTANCE OF VALUES
Importance of cultivation of values, Sense of duty, Devotion, Self-reliance, Confidence, Concentration, Truthfulness, Cleanliness. Honesty, Humanity, Power of faith, National Unity, Patriotism, Love for nature, Discipline

UNIT III

INFLUENCE OF VALUE EDUCATION
Personality and Behaviour development - Soul and Scientific attitude. Positive Thinking, Integrity and discipline, Punctuality, Love and Kindness, Avoid fault Thinking, Free from anger, Dignity of labour, Universal brotherhood and religious tolerance, True friendship Happiness Vs suffering, love for truth.

UNIT IV

REINCARNATION THROUGH VALUE EDUCATION

UNIT V

VALUE EDUCATION IN SOCIAL EMPOWERMENT
Equality, Non violence, Humility, Role of Women, All religions and same message, Mind your Mind, Self-control, Honesty, Studying effectively

OUTCOMES:
CO1 – Gain knowledge of self-development
CO2 – Learn the importance of Human values
CO3 – Develop the overall personality through value education
CO4 – Overcome the self destructive habits with value education
CO5 – Interpret social empowerment with value education

TOTAL: 45 PERIODS

REFERENCES:
OBJECTIVES:
- Understand the methodology of pedagogy.
- Compare pedagogical practices used by teachers in formal and informal classrooms in developing countries.
- Infer how can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy.
- Illustrate the factors necessary for professional development.
- Identify the Research gaps in pedagogy.

UNIT I  INTRODUCTION AND METHODOLOGY:  9
Aims and rationale, Policy background, Conceptual framework and terminology - Theories of learning, Curriculum, Teacher education - Conceptual framework, Research questions - Overview of methodology and Searching.

UNIT II  THEMATIC OVERVIEW  9
Pedagogical practices are being used by teachers in formal and informal classrooms in developing countries - Curriculum, Teacher education.

UNIT III  EVIDENCE ON THE EFFECTIVENESS OF PEDAGOGICAL PRACTICES  9
Methodology for the in depth stage: quality assessment of included studies - How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy? - Theory of change - Strength and nature of the body of evidence for effective pedagogical practices - Pedagogic theory and pedagogical approaches - Teachers’ attitudes and beliefs and Pedagogic strategies.

UNIT IV  PROFESSIONAL DEVELOPMENT  9
Professional development: alignment with classroom practices and follow up support - Peer support - Support from the head teacher and the community - Curriculum and assessment - Barriers to learning: limited resources and large class sizes

UNIT V  RESEARCH GAPS AND FUTURE DIRECTIONS  9
Research design – Contexts – Pedagogy - Teacher education - Curriculum and assessment - Dissemination and research impact.

TOTAL: 45 PERIODS

OUTCOMES:
- Understand the methodology of pedagogy.
- Understand Pedagogical practices used by teachers in formal and informal classrooms in developing countries.
- Find how can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy.
- Know the factors necessary for professional development.
- Identify the Research gaps in pedagogy.
REFERENCES:
OBJECTIVES:

- Develop healthy mind in a healthy body thus improving social health also improve efficiency
- Invent Do’s and Don’t’s in life through Yam
- Categorize Do’s and Don’t’s in life through Niyam
- Develop a healthy mind and body through Yog Asans
- Invent breathing techniques through Pranayam

UNIT I
INTRODUCTION TO YOGA
Definitions of Eight parts of yog.( Ashtanga )

UNIT II
YAM
Do’s and Don’t’s in life.
Shaucha, santosh, tapa, swadhyay, ishwarpranidhan

UNIT III
NIYAM
Do’s and Don’t’s in life.
Ahinsa, satya, astheya, bramhacharya and aparigraha

UNIT IV
ASAN
Various yog poses and their benefits for mind & body

UNIT V
PRANAYAM
Regularization of breathing techniques and its effects-Types of pranayam

OUTCOMES:
CO1 – Develop healthy mind in a healthy body thus improving social health also improve efficiency
CO2 – Learn Do’s and Don’t’s in life through Yam
CO3 – Learn Do’s and Don’t’s in life through Niyam
CO4 – Develop a healthy mind and body through Yog Asans
CO5 – Learn breathing techniques through Pranayam

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REFERENCES:
1. “Rajayoga or conquering the Internal Nature” by Swami Vivekananda, Advaita Ashrama (Publication Department), Kolkata
2. ‘Yogic Asanas for Group Training-Part-I” : Janardan Swami Yogabhyasi Mandal, Nagpur
OBJECTIVES:
- Develop basic personality skills holistically
- Develop deep personality skills holistically to achieve happy goals
- Rewrite the responsibilities
- Reframe a person with stable mind, pleasing personality and determination
- Discover wisdom in students

UNIT I NEETISATAKAM-HOLISTIC DEVELOPMENT OF PERSONALITY - I 9
Verses- 19,20,21,22 (wisdom) - Verses- 29,31,32 (pride & heroism) – Verses- 26,28,63,65 (virtue)

UNIT II NEETISATAKAM-HOLISTIC DEVELOPMENT OF PERSONALITY - II 9
Verses- 52,53,59 (dont's) - Verses- 71,73,75,78 (do's)

UNIT III APPROACH TO DAY TO DAY WORK AND DUTIES 9
Shrimad Bhagwad Geeta: Chapter 2-Verses 41, 47,48 - Chapter 3-Verses 13, 21, 27, 35 Chapter 6-
Verses 5,13,17,23, 35 - Chapter 18-Verses 45, 46, 48

UNIT IV STATEMENTS OF BASIC KNOWLEDGE – I 9
Statements of basic knowledge - Shrimad Bhagwad Geeta: Chapter2-Verses 56, 62, 68 Chapter 12 -
Verses 13, 14, 15, 16,17, 18

UNIT V PERSONALITY OF ROLE MODEL - SHRIMAD BHAGWADGEETA 9
Chapter2-Verses 17, Chapter 3-Verses 36,37,42 -  Chapter 4-Verses 18, 38,39 Chapter18 – Verses
37,38,63

TOTAL: 45PERIODS

OUTCOMES:
CO1: To develop basic personality skills holistically
CO2: To develop deep personality skills holistically to achieve happy goals
CO3: To rewrite the responsibilities
CO4: To reframe a person with stable mind, pleasing personality and determination
CO5: To awaken wisdom in students

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REFERENCES:
1. Gopinath,Rashtriya Sanskrit Sansthanam P, Bhartrihari’s ThreeSatakam , Niti-sringar-
vairagya, New Delhi,2010
2. Swami Swarupananda , Srimad Bhagavad Gita, Advaita Ashram,Publication Department,
Kolkata,2016
COURSE OBJECTIVES
The course will introduce the students to

- get a knowledge about Indian Culture
- Know Indian Languages and Literature religion and philosophy and the fine arts in India
- Explore the Science and Scientists of Ancient, Medieval and Modern India
- Understand education systems in India

UNIT I  INTRODUCTION TO CULTURE  9
Culture, civilization, culture and heritage, general characteristics of culture, importance of culture in human literature, Indian Culture, Ancient India, Medieval India, Modern India.

UNIT II  INDIAN LANGUAGES AND LITERATURE  9
Indian Languages and Literature – I: Languages and Literature of South India, – Indian Languages and Literature – II: Northern Indian Languages & Literature

UNIT III  RELIGION AND PHILOSOPHY  9
Major religions practiced in India and Understanding their Philosophy – religious movements in Modern India (Selected movements only)

UNIT IV  FINE ARTS IN INDIA (ART, TECHNOLOGY & ENGINEERING)  9
Indian Painting, Indian handicrafts, Music, divisions of Indian classic music, modern Indian music, Dance and Drama, Indian Architecture (ancient, medieval and modern), Science and Technology in India, development of science in ancient, medieval and modern India

UNIT V  EDUCATION SYSTEM IN INDIA  9
Education in ancient, medieval and modern India, aims of education, subjects, languages, Science and Scientists of Ancient India, Science and Scientists of Medieval India, Scientists of Modern India

TOTAL: 45 PERIODS

COURSE OUTCOMES
After successful completion of the course the students will be able to

- Understand philosophy of Indian culture.
- Distinguish the Indian languages and literature.
- Learn the philosophy of ancient, medieval and modern India.
- Acquire the information about the fine arts in India.
- Know the contribution of scientists of different eras.
- Understand education systems in India
REFERENCES:
5. Satya Prakash, “Founders of Sciences in Ancient India”, Vijay Kumar Publisher, 1989
Course Objectives: The main learning objective of this course is to make the students an appreciation for:

1. Introduction to Sanga Tamil Literature.
2. 'Agathinai' and 'Purathinai' in Sanga Tamil Literature.
3. 'Attruppadai' in Sanga Tamil Literature.
4. 'Puranaanuru' in Sanga Tamil Literature.
5. 'Pathitrupaththu' in Sanga Tamil Literature.

UNIT I  SANGA TAMIL LITERATURE INTRODUCTION
Introduction to Tamil Sangam—History of Tamil Three Sangams—Introduction to Tamil Sangam Literature—Special Branches in Tamil Sangam Literature—Tamil Sangam Literature’s Grammar—Tamil Sangam Literature’s parables.

UNIT II 'AGATHINAI'AND'PURATHINAI'
Tholkappiyar’s Meaningful Verses—Three literature materials—Agathinai’s message—History of Culture from Agathinai—Purathinai—Classification—Message to Society from Purathinai.

UNIT III ‘ATTRUPPADAI’.
Attruppadai Literature—Attruppadai in 'Puranaanuru'—Attruppadai in 'Pathitrupaththu'—Attruppadai in 'Paththupaattu'.

UNIT IV ‘PURANAANURU’
Puranaanuru on Good Administration, Ruler and Subjects—Emotion & Its Effect in Puranaanuru.

UNIT V ‘PATHITRUPATHTHU’
Pathitrupaththu in 'Ettuthogai'—Pathitrupaththu’s Parables—Tamil dynasty: Valor, Administration, Charity in Pathitrupaththu—Message to Society from Pathitrupaththu.

Total (L:45) = 45 PERIODS

COURSE OUTCOMES: Upon completion of this course, the students will be able to:

1. Appreciate and apply the messages in Sanga Tamil Literature in their life.
2. Differentiate 'Agathinai' and 'Purathinai' in their personal and societal life.
3. Appreciate and apply the messages in 'Attruppadai' in their personal and societal life.
4. Appreciate and apply the messages in 'Puranaanuru' in their personal and societal life.
5. Appreciate and apply the messages in 'Pathitrupaththu' in their personal and societal life.

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**HSMC– ELECTIVES – HUMANITIES I (ODD SEMESTER)**

HU5171 LANGUAGE AND COMMUNICATION LT P C 3 0 0 3

**COURSE DESCRIPTION**

This course offers an introduction to language and communication. The primary goal of this course is to familiarize students with key ideas related to communication using language as well as non-verbal means. Ideas related to the use of language and the underlying power structures are also examined. The course also examines the role of media in communication and in the dissemination of ideas as well as opinions.

**Objectives**

- To familiarize students with the concept of communication using linguistic and non-linguistic resources.
- To help students ask critical questions regarding facts and opinions.
- To provide students with the material to discuss issues such as language and power structures.
- To help students think critically about false propaganda and fake news.

**Learning Outcomes**

- Students will be able to use linguistic and non-linguistic resources of language in an integrated manner for communication.
- Students will be able to analyse communication in terms of facts and opinions.
- Students will be able to discuss, analyse and argue about issues related to language and power.

**UNIT I Linguistic and Non-Linguistic Resource of Communication:** 9

- a) Writing and Speech
- b) Distinction between language structure and language use, form and function, acceptability and grammaticality
- c) Gestures and Body language, pictures and symbols, cultural appropriacy
- d) Communicative Competency, context and situation, combination of linguistic and non-linguistic elements of communication

**UNIT II Structure of Writing/Conversation:** 9

- a) Language skills and the communication cycle; speaking and listening, writing and reading
- b) Initiating and closing conversations, intervention, turn taking
- c) Writing for target reader, rhetorical devices and strategies
- d) Coherence and Cohesion in speech and writing

**UNIT III Power Structure and Language Use:** 9

- a) Gender and language use
- b) Politeness expressions and their use
- c) Ethical dimensions of language use
- d) Language rights as part of human rights

**UNIT IV Media Communication:** 9

- a) Print media, electronic media, social media
- b) Power of media
- c) Manufacturing of opinion, fake news and hidden agendas
UNIT V  PERSUASIVE COMMUNICATION AND MISCOMMUNICATION:  9
a) Fundamentals of persuasive communication
b) Persuasive strategies
c) Communication barriers

TOTAL : 45 PERIODS

TEXT BOOKS:

HU5172 VALUES AND ETHICS

OBJECTIVES:
- Teach definition and classification of values.
- Explain Purusartha.
- Describe Sarvodaya idea.
- Summarize sustenance of life.
- Conclude views of hierarchy of values.

UNIT I  DEFINITION AND CLASSIFICATION OF VALUES  9
Extrinsic values- Universal and Situational values- Physical- Environmental-Sensuous- Economic-Social- Aesthetic-Moral and Religious values

UNIT II CONCEPTS RELATED TO VALUES  9
Purusartha-Virtue- Right- duty- justice- Equality- Love and Good

UNIT III  IDEOLOGY OF SARVODAYA  9
Egoism- Altruism and universalism- The Ideal of Sarvodaya and Vasudhaiva Kutumbakam

UNIT IV  SUSTENANCE OF LIFE  9
The Problem of Sustenance of value in the process of Social, Political and Technological Changes

UNIT V  VIEWS ON HIERARCHY OF VALUES  9
The Problem of hierarchy of values and their choice, The views of Pt. Madan Mohan Malviya and Mahatma Gandhi

TOTAL: 45 PERIODS

OUTCOMES:
- CO1: Able to understand definition and classification of values.
- CO2: Able to understand purusartha.
- CO3: Able to understand sarvodaya idea.
- CO4: Able to understand sustenance of life.
- CO5: Able to understand views of hierarchy of values.

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TEXTBOOKS:
2. Little, William: An Introduction to Ethics (Allied Publisher, Indian Reprint 1955)

HU5173 HUMAN RELATIONS AT WORK L T P C 3 0 0 3

OBJECTIVES:
- Illustrate human relations at work its relationship with self.
- Explain the importance of interacting with people at work to develop teamwork.
- Infer the importance of physical health in maintaining human relations at work.
- Describe the importance of staying psychologically healthy.
- Identify the essential qualities for progressing in career.

UNIT I UNDERSTANDING AND MANAGING YOURSELF 9
Human Relations and You: Self-Esteem and Self-Confidence: Self-Motivation and Goal Setting; Emotional Intelligence, Attitudes, and Happiness; Values and Ethics and Problem Solving and Creativity.

UNIT II DEALING EFFECTIVELY WITH PEOPLE 9
Communication in the Workplace; Specialized Tactics for Getting Along with Others in the Workplace; Managing Conflict; Becoming an Effective Leader; Motivating Others and Developing Teamwork; Diversity and Cross-Cultural Competence.

UNIT III STAYING PHYSICALLY HEALTHY 9
Yoga, Pranayam and Exercise: Aerobic and anaerobic.

UNIT IV STAYING PSYCHOLOGICALLY HEALTHY 9
Managing Stress and Personal Problems, Meditation.

UNIT V DEVELOPING CAREER THRUST 9

TOTAL: 45 PERIODS

OUTCOMES:
Students will be able to
CO1: Understand the importance of self-management.
CO2: Know how to deal with people to develop teamwork.
CO3: Know the importance of staying healthy.
CO4: Know how to manage stress and personal problems.
CO5: Develop the personal qualities essential for career growth.

REFERENCES:
COURSE DESCRIPTION
Psychological Processes course is designed for students to be aware of the basic principles of psychology for the better understanding of people’s psyche and behaviour around them. This course enables learners to use the optimal use of different forms of thinking skills and thereby results in effective communication in diverse situations. Every unit of the syllabus highlights the psychological process of people, the most powerful and constructive use of perceptions.

OBJECTIVES
The major objectives of this course is
- To develop students’ awareness – on psychology, learning behavior and usage of perception effectively.
- To learn to use the various kinds of thinking in a formal context.
- To critically evaluate content and comprehend the message on the bases of perception, personality and intelligence.

UNIT 1: INTRODUCTION

UNIT 2: SENSORY & PERCEPTUAL PROCESSES
Some general properties of Senses: Visual system – the eye, colour vision – Auditory system – Hearing, listening, Sounds - Other senses - Selective attention; physiological correlates of attention; Internal influences on perception learning – set - motivation & emotion - cognitive styles; External influences on perception figure and ground separation – movement – organization – illusion; Internal- external interactions: Constancy - Depth Perception- Binocular & Monocular Perception; Perceptual defense & Perceptual vigilance; Sensory deprivation -Sensory bombardment; ESP - Social Perception.

UNIT 3: COGNITION & AFFECT

UNIT 4: THINKING, PROBLEM-SOLVING & DECISION MAKING

UNIT 5: PERSONALITY & INTELLIGENCE
Psychological phenomena & Attributes of humans - cognition, motivation, and behavior - thoughts, feelings, perceptions, and actions – personality dimensions, traits, patterns - Specialized knowledge, performance accomplishments, automaticity or ease of functioning, skilled performance under challenge - generative flexibility, and speed of learning or behavior change.

References
COURSE DESCRIPTION
This course introduces students to multidisciplinary studies in Education, Technology and Society. Students will get an understanding of the relationship between education, technology and society. They will also learn about the long lasting impact of good education in a technologically advanced society.

COURSE OBJECTIVES:
The course aims
- To help learners understand the basics of different types of technology utilised in the field of education
- To make them realize the impact of education in society
- To make them evolve as responsible citizen in a technologically advanced society

LEARNING OUTCOMES
By the end of the course, learners will be able to
- Understand the various apps of technology apps and use them to access, generate and present information effectively.
- Apply technology based resources and other media formats equitably, ethically and legally.
- Integrate their technical education for betterment of society as well as their personal life.

UNIT I INDIAN EDUCATION SYSTEM
Gurukul to ICT education – Teacher as facilitator – Macaulay’s Minutes – English medium vs Regional medium – Importance of Education in Modern India - Challenges in Education

UNIT II LEARNING THEORIES

UNIT III TECHNOLOGICAL ADVANCEMENTS
Web tools – Social media in education – elearning – MOOCs – Mobile assisted learning – Learning Apps – Blended learning - Self-directed learning

UNIT IV EDUCATIONAL TECHNOLOGY
Technological implications on Education – Teaching, Learning & Testing with Technology - Advantages and drawbacks – Critical analysis on the use of technology

UNIT V ETHICAL IMPLICATIONS
Plagiarism – Online Copyright issues – Ethical and value implications of education and technology on individual and society.

TOTAL: 45 PERIODS

TEACHING METHODS
Teaching modes include guest lectures, discussion groups, presentations, visual media, and a practicum style of learning.

EVALUATION
As this is course is not a content based course, it focuses more on the ethical use of technology in education and society, and so, evaluation can be based on assignments and discussions. So there is no need for an end semester examination. Internals marks can be taken for the total marks.

INTERNAL (100 % WEIGHTAGE)
(a) Written Test (40 marks)
(b) Assignment: Write a real time report of the technology use in any school / college (15 marks)
(c) Presentation: Students choose any one of the technological tools and present its relevance to education and society (15 marks)
(d) Group discussion: Students discuss in groups on case studies relating to various challenges in education and technology use in society (20 marks)
(e) Blog entry: Making weekly blog posts in Class Blog on the topics related to the course posted by the instructor and commenting on others’ posts. (10 marks)

REFERENCES
1) Education and Social order by Bertrand Russel
2) Theories of learning by Bower and Hilgard
OBJECTIVES
- To create a new understanding by teaching philosophy through a comparison of Indian and Western traditions.
- To foster critical thinking and imagination by dealing with inter-related concepts in literature and science.
- To bridge the gap between the sciences and humanities through introspective analyses.
- To nurture an understanding of the self and elucidates ways to progress towards a higher understanding of one’s self and others.

UNIT I KNOWLEDGE

UNIT II ORIGIN

UNIT III WORD

UNIT IV KNOWLEDGE AS POWER/Oppression

UNIT V SELF KNOWLEDGE/BRAHMAN

OUTCOMES:
On completion of the course, the students will be able to:
1. Think sceptically, ask questions and to arrive at deductions.
2. Connect and relate different branches of thought.
3. Comprehends the relation between language, thought and action.
4. Arrive at a better understanding of self and others and forms a new outlook.

REFERENCES:

HU5177 APPLICATIONS OF PSYCHOLOGY IN EVERYDAY LIFE LT P C
3 0 0 3

UNITI INTRODUCTION 7
Nature and fields.

UNITII PSYCHOLOGY IN INDUSTRIES AND ORGANIZATIONS 9
Job analysis; fatigue and accidents; consumer behavior.

UNITIII PSYCHOLOGY AND MENTAL HEALTH 11
Abnormality, symptoms and causes psychological disorders.

UNITIV PSYCHOLOGY AND COUNSELING 7
Need of Counseling, Counsel or and the Counselee, Counseling Process, Areas of Counseling.

UNITV PSYCHOLOGY AND SOCIAL BEHAVIOUR 11
Group, group dynamics, team building, Prejudice and stereotypes; Effective Communication, conflict and negotiation.

TOTAL: 45 PERIODS

TEXTBOOKS
COURSE DESCRIPTION
This course offers an introduction to Gender Studies that asks critical questions about the meanings of sex and gender in Indian society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary drawing from Indian literature and media studies, to examine cultural assumptions about sex, gender, and sexuality. This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with class, caste and other social identities. This course also seeks to build an understanding of the concepts of gender, gender-based violence, sexuality, and rights and their impact on development through a number of discussions, exercises and reflective activities.

Objectives
✓ To familiarize students with the concepts of sex and gender through literary and media texts.
✓ To help students ask critical questions regarding gender roles in society.
✓ To provide students with the material to discuss gender issues such as gender based discrimination, violence and development.
✓ To help students think critically about gender based problems and solutions.

Learning Outcomes
➢ Students will be able to critically read literary and media texts and understand the underlying gender perspectives in them.
➢ Students will be able to analyse current social events in the light of gender perspectives.
➢ Students will be able to discuss, analyse and argue about issues related to gender and their impact on society, culture and development.

UNIT I: Introduction to Gender
• Definition of Gender
• Basic Gender Concepts and Terminology
• Exploring Attitudes towards Gender
• Social Construction of Gender
Texts:
1. Sukhu and Dukhu (Amar Chitra Katha)
2. The Cat who Became a Queen (Folk tale, J. Hinton Knowles, Folk-Tales of Kashmir. London: Kegan Paul, Trench, Trübner, and Company, 1893, pp. 8-10.)

UNIT II: Gender Roles and Relations
• Types of Gender Roles
• Gender Roles and Relationships Matrix
• Gender-based Division and Valuation of Labour
Texts:
1. Muniyakka (Short Story, Lakshmi Kannan, Nandanvan and Other Stories, Hyderabad: Orient Blackswan, 2011)

UNIT III: Gender Development Issues
• Identifying Gender Issues
• Gender Sensitive Language
• Gender, Governance and Sustainable Development
• Gender and Human Rights
• Gender and Mainstreaming
Texts:
2. Tell Us Marx (Poem, Mallika Sengupta, Translated by Sanjukta Dasgupta)

UNIT IV: Gender-based Violence
• The concept of violence
• Types of Gender-based violence
• The relationship between gender, development and violence
• Gender-based violence from a human rights perspective

Texts:
1. Lights Out (Play, Manjula Padmanabhan)
2. Lights Out (Video of play enacted)

UNIT V: Gender and Culture
• Gender and Film
• Gender, Media and Advertisement

Texts:
1. Mahanagar (Movie: Satyajit Ray)
2. Beti Bachao Beti Padhao Advertisements

READINGS: Relevant additional texts for readings will be announced in the class. Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments.

ASSESSMENT AND GRADING:
Discussion & Classroom Participation: 20%
Project/Assignment: 30%
End Term Exam: 50%

HU5272 ETHICS AND HOLISTIC LIFE

OBJECTIVES:
• To emphasize the meaning and nature of ethics, human values and holistic life for leading a good, successful and happy life through continuous examination of thoughts and conduct in day to day life.
• To understand the status and responsible role of individual in abatement of value crisis in contemporary world in order to develop a civilized and human society. Understanding the process of ethical decision making through critical assessment of incidents/cases of ethical dilemmas in personal, professional and social life.
• To view the place of Ethics and Human Values in the development of individual and society through identification and cross examination of life values and world view of his/her role models in society.

UNIT I HUMAN LIFE, ITS AIM AND SIGNIFICANCE
The concept of a successful life, happy life and a meaningful life, Ethical and decision making capability and its development: Meaning of Ethical dilemma, sharing real life experiences.

UNIT II CREATIVE AND LEADERSHIP ABILITY AND THEIR DEVELOPMENT
Intellectual, Emotional, Creative, Ethico-spiritual development, Aesthetic sense, Self-dependency, Activeness, Development of positive attitude.

UNIT III HARMONY IN PERSONAL AND SOCIAL LIFE:
Concept of personal and group Ethics; Balance between - rights and duties-welfare of self and welfare of all, Creating a value based work culture in hostel, classroom and other places in the campus and society.

UNIT IV CHARACTER, RIGHTEOUSNESS AND VIRTUES FOR A MEANINGFUL LIFE
Egolessness, Humility, Righteousness, Purity, Truthfulness, Integrity, Self-restraint, Self-control, Sense of responsibility, Empathy, Love, Compassion, Maitri / Comradeship, Cooperation, Tolerance.

UNIT V DILEMMA BETWEEN MATERIALISTIC DEVELOPMENT AND HUMAN WELFARE
OUTCOMES:
On completion of the course, the students will be able to:

1. Enable students to understand the concept of contemporary ethics at different levels: Individual, local and Global and enable them to cross examine the ethical and social consequences of the decisions of their life-view and world view.
2. Develop the ability of students to create a balance between their individual freedom and social responsibilities and enable them to identify the personal, professional and social values and integrate them in their personality after cross examination.
3. Enable students to cross examine their earlier decisions taken in life and understand the meaning of ethical dilemma to overcome the ethical dilemmas and engage in critical reflection.
4. Develop positive habits of thought and conduct and work cohesively with fellow beings who have variety of strengths, experiences, shortcomings and challenges, hence to enable them to handle diverse type of personalities.
5. Enable students to develop a method for making ethically sound decisions for themselves, within hostels, classrooms, university campus and society.

HU5273 LAW AND ENGINEERING

UNIT I THE LEGAL SYSTEM: SOURCES OF LAW AND THE COURT STRUCTURE 9
Enacted law - Acts of Parliament are of primary legislation, Common Law or Case law- Principles taken from decisions of judges constitute binding legal rules. The Court System in India and Foreign Courtiers. (District Court, District Consumer Forum, Tribunals, High Courts, Supreme Court) Arbitration: As an alternative to resolving disputes in the normal courts, parties who are in dispute can agree that this will instead be referred to arbitration.

UNIT II LAWS 9
Basic principles of contract law, sale of goods law, laws relating to industrial pollution, accident, environmental protection, health and safety at work, patent law, constitutional law: the supreme law of the land, Information technology law and cyber crimes.

UNIT III BUSINESS ORGANISATIONS 9
Sole traders (Business has no separate identity from you, all business property belongs to you).

UNIT IV LAW AND SOCIETY 9
Interdisciplinary nature of law, legal ideologies/philosophy/ schools of jurisprudence.

UNIT V CASE STUDIES 9
Important legal disputes and judicial litigations

TOTAL: 45 PERIODS

HU5274 FILM APPRECIATION

COURSE DESCRIPTION
This is an intensive course designed to promote comprehensive understanding and insights into the nature of cinema and other related forms and practices. Movies, though at times are used more as escapism, they are also a true art form and expressive tool used by writers, directors and actors. This course will explore the aesthetics of cinema, the concepts behind storytelling and various other elements of a film. It will also explore the impact of movies in our society and in our lives. It also encourages students to use films as a medium to analyse visual texts and read underlying messages.
OBJECTIVES:
- To help learners understand the various movie genres and its types.
- To understand various elements that contributes to film making.
- To make them realize the impact of film in society.
- To analyse the visual media and interpret the underlying messages.

UNIT I THE COMPONENTS OF FILMS
Story, Screenplay & Script – Actors – Director – Crew Members – Mis En Scene – Structure of A Film – Narrative Elements – Linear & Non-Linear – Types of Movie Genres: Mysteries, Romantic Comedies, Horror Etc.

UNIT II EVOLUTION OF FILM

UNIT III FILMS ACROSS THE WORLD

UNIT IV INDIAN FILMS

UNIT V INTERPRETING FILMS
Film Criticism & Appreciation – Censorship in Movies – Cultural Representation in Movies – Television – New Media & Online Media – Films Beyond Entertainment.

TOTAL: 45 PERIODS

OUTCOMES
On completion of the course, the students will be able to:
- Recognize types of films, their impact on society and their roles in our lives.
- Have an understanding of the concepts of storytelling, Mise en Scene, and other elements of film making.
- Interpret the underlying messages in the movies.

Teaching Methods
- Each unit consists of reading materials, learning activities videos, websites. Students are expected to watch movies sometimes in class and at times at home and discuss in class.

Evaluation
- As this is course is critical appreciation course on films, there is no written end semester examination. The course is more on learning how to critically analyse a movie and appreciate its finer elements. Therefore evaluation can be based on assignments and discussions. Internals marks can be taken for the total marks.

Internal (100 % weightage)
- Assignment 1: Write a movie review with critical analysis (20 marks).
- Assignment2 : Write a script for a scene taken from a short story / novella (20 marks).
- Presentation: Students choose any one topic related to films and present it to the audience. (25 marks)
- Group discussion : Students discuss in groups on the various aspects of movies and its impact on society. (25 marks)
- Blog entry: Making weekly blog posts in Class Blog on the topics related to the course posted by the instructor and commenting on others’ posts. (10 marks)

REFERENCES
1. A Biographical Dictionary of Film by David Thomson, Secker & Warburg, 1975
2. Signs and Meaning in the Cinema by Peter Wollen, Secker & Warburg, 1969
3. The World Viewed by Stanley Cavell 1971
4. Film Style and Technology: History and Analysis by Barry Salt, Starword, 1983
FUNDAMENTALS OF LANGUAGE AND LINGUISTICS

OBJECTIVES

- To broadly introduce students to the formal and theoretical aspects of linguistics.
- To enable learners to understand the various practical applications of language and recent findings in the field of applied linguistics.

CONTENTS:

UNIT I LANGUAGE AND LINGUISTICS: AN OVERVIEW

UNIT II MORPHOLOGY - WORDS OF LANGUAGE

UNIT III SYNTAX- THE SENTENCE PATTERNS OF LANGUAGE AND SEMANTICS-THE MEANING OF LANGUAGE

UNIT IV PHONETICS – THE SOUNDS OF LANGUAGE

UNIT V APPLIED LINGUISTICS - THE PRACTICAL APPLICATIONS OF LANGUAGE
Language learning and teaching (ELT)- lexicography-translation studies-computational linguistics-neurolinguistics (speech pathology and language disorders)- forensic linguistics – sociolinguistics.

TOTAL: 45 PERIODS

Teaching Methods:
Lectures, discussion.

Evaluation Internal and External:
Internal: 2 written tests + assignments, seminars, project (50+15+15+20).
External: A 3 hour written exam (50 marks)

REFERENCES:

UNDERSTANDING SOCIETY AND CULTURE THROUGH LITERATURE

OBJECTIVES

- To internalize the importance of language by understanding its role in the transformation of man.
- To look at language, literature and culture as locus of identity and change.
- To extract meaning from existing literatures and cultures.
- To identify meanings in modern life by reconnecting with lost cultures.

Unit 1 Introduction
Why study literature? Tracing the origin – pictures. Tokens as precursors of writing. Movement from three dimensions to two dimensions- Pictography. From visual to oral -Logography. Reading out literature to young
Unit 2. Reading Culture
Reading culture through language, signs and consumables- Roland Barthes. Culture through poems- Nissim Ezekiel’s ‘The night of the Scorpion’. ‘Nothing’s Changed’- Tatamkhulu Afrika- Apartheid. Ruskin Bond- ‘Night train at Deoli’- How real life is different from movies.

Unit 3. Identifying Meaning
Searching and locating meaning through literature. Looking for order in a chaotic world. The Myth of Sisyphus (Albert Camus) and Adi Shankar’s ‘Jagat Mithya’- the world as an illusion. The Indian version as ‘meaninglesss meaning’.

Unit 4. Post Modernism
‘If on a winter’s night a traveler’- Italo Calvino. The book about the reader- the experience of reading as reading. Metafiction. Selfie Culture. Visual Culture as purpose of modern life.

Unit 5. Returning to Pictures

Reading list
1. Bond, Ruskin: ‘Night train at Deoli’
2. Ezekiel, Nissim: ‘The Night of the Scorpion’
3. Afrika, Tatamkhulu: ‘Nothing’s Changed’
4. Barthes, Roland: Mythologies
5. Shankaracharya: Viveka Chudamani
6. Camus, Albert- The Myth of Sisyphus
7. Calvino, Italo: If on a winter’s night a traveler

Outcome
- Can identify the connections among language, literature and culture.
- Is able to relate between seemingly different aspects of life.
- Understands the fractions in modern life and can assimilate meanings.