**DKTE Society's**

**TEXTILE & ENGINEERING INSTITUTE**

**Rajwada, Ichalkaranji 416115**

**(An Autonomous Institute)**

**DEPARTMENT: TEXTILES**

**CURRICULUM**

**B. Tech. Textile Technology Program**

**First Year**

With Effect From

2020-2021



Promoting Excellence in Teaching
Learning & Research

## First Year B. Tech Textile Technology
### Semester-I

| Sr. No. | Course Code | Name of the Course | Group | Teaching Scheme | | | | Credits |
|---|---|---|---|---|---|---|---|---|
| | | | | Theory Hrs/ Week | Drawing Hrs/ Week | Practical Hrs/ Week | Total | |
| 1 | TTL161 | Textile Mathematics - I | B | 3 | | | 3 | 3 |
| 2 | TTL162 | Applied Physics | B | 3 | | | 3 | 3 |
| 3 | TTL163 | Engineering Graphics | C | 2 | | | 2 | 2 |
| 4 | TTL164 | Textile Fibres | D | 3 | | | 3 | 3 |
| 5 | TTL165 | Yarn Forming Technology - I | D | 3 | | | 3 | 3 |
| 6 | TTP166 | Engineering Graphics Lab | C | | | 2 | 2 | 1 |
| 7 | TTP167 | Yarn Forming Technology - I Lab | D | | | 2 | 2 | 1 |
| 8 | TTP168 | Fundamentals of Computer and Programming Lab | B | | | 2 | 2 | 1 |
| **Total** | | | | **15** | **0** | **6** | **21** | **18** |

### Group Details

A: Humanities, Social Science & Management

B: Basic Science

C: Engineering Science

D: Professional Core Courses

E: Professional Electives

F: Open Elective

G: Project / Seminar / Internship

H: Mandatory non-Credit Courses

## First Year B. Tech. Semester – I
## TTL161: TEXTILE MATHEMATICS- I

| Teaching Scheme | |
|---|---|
| Lectures | 3Hrs. / Week |
| Total Credits | 3 |
| | |
| | |

| Evaluation Scheme | |
|---|---|
| SE-I | 25 |
| SE-II | 25 |
| SEE | 50 |
| Total | 100 |

| Course Objectives | |
|---|---|
| 1. | Introduce students with normal form, echelon form and rank of matrix. Prepare them to solve the problems of finding rank and solve system of equations. |
| 2. | Introduce students with the theory of finding derivative numerically and fitting curve to given data. Prepare them to solve problems of numerical differentiation and curve fitting. |
| 3. | Introduce students with basic concept of statistical data, collection and types of data, classification, graphical representation, frequency distribution with construction, central tendency and dispersion of data, measures of central tendency and dispersion. Prepare them to solve problem of these concepts with interpretation. |
| 4. | Introduce students with concept of skewness and kurtosis, measures of skewness and kurtosis. Prepare them to solve and interpret problems of skewness. |

| Course Outcomes | |
|---|---|
| At the end of the course students have understood | |
| 1. | The theory of normal form, echelon form and rank of matrix. Also, they can solve problems of finding rank and solve system of equations. |
| 2. | The theory finding derivative numerically and fitting curve to given data. Also, they are able to solve problems related to numerical differentiation and curve fitting. |
| 3. | Basic concept of statistical data, collection and types of data, classification, graphical representation, frequency distribution with construction, central tendency and dispersion of data, measures of central tendency and dispersion. Also, they are able to analyse and interpret given statistical data using these concepts. |
| 4. | Concept of skewness and kurtosis, measures of skewness and kurtosis. Also, they are able to solve and interpret problems of skewness. |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | Matrix: Rank of matrix (Normal form of matrix, Echelon form of Matrix) Solution of simultaneous linear equations (Homogeneous & Non-Homogeneous) Characteristic equation, eigen values, eigen vectors. Caley Hamilton's theorem. | 7 |
| Unit 2. | Successive Differentiation & Partial Differentiation: Introduction, standard results, Leibnitz rule. Introduction of p. d., total differentiation, | 7 |

| | | |
|---|---|---|
| | Euler's theorem on homogeneous function. Jacobean (J.J'=1) only, Errors & approximation. | |
| **Unit 3.** | Numerical Differentiation & curve fitting: Newton's forward & backward formulae, Sterling's formula. Newton's divided difference formula. Fitting of curves: y=a+bx, y=a+bx+cx2, y=a.x^b by least square method | **6** |
| **Unit 4.** | Introduction of Statistics: Definitions of Population, Variable, Attribute, Census Survey, Sample Survey, Random sample. Raw statistical data, collection, classification, Frequency distribution, class limits & boundary, class width, mid-point. Histogram, Frequency polygon, Frequency curve. Measures of central tendency: Arithmetic Mean (A.M.), Median, Mode, Combined Mean & Computation Partition values : Quartiles deciles and percentiles & Computation | **7** |
| **Unit 5.** | Measures of dispersion: Range, Quartile deviation, Mean deviation, Standard deviation as Absolute measures of dispersion, Coefficient of range, quartile deviation, mean deviation, coefficient of variation as Relative measures of dispersion, consistency of data & computation | **7** |
| **Unit 6.** | Measures of Skewness& kurtosis: Skewness, types, Karl Pearson's & Bow ley's coefficient of skewness& Computation. Kurtosis definition and types only. (No Examples of Kurtosis) | **5** |

| Reference Books | |
|---|---|
| 1 | A textbook of applied mathematics Vol.-I & II by P.N. & J.N. Wartikar |
| 2 | Higher engineering mathematics by B.S. Grewal |
| 3 | A textbook of applied mathematics by Bali, Saxena&Iyangar. |
| 4 | Mathematical Statistics by J.E. Fruend. |
| 5 | Probability & Statistics for engineers by Johnson. |
| 6 | Statistical methods by Kumbhojkar |

**First Year B. Tech. Semester – I**
**TTL162: APPLIED PHYSICS**

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Lectures | 3 Hrs. / Week | SE-I | 25 |
| Total Credits | 03 | SE-II | 25 |
| | | SEE | 50 |
| | | Total | 100 |

| Course Objectives | |
|---|---|
| 1. | To understand significance of basic concepts of physics involved in textiles |
| 2. | To discuss the different factors from physics affecting yarn and fabric properties |
| 3. | To explain the different principles from physics involved in textiles. |
| 4. | To explain the different methods of measurement and calculate the different quantities of physics involved in textiles. |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Understand significance of basic concepts of physics involved in textiles |
| 2. | Discuss the different factors from physics affecting yarn and fabric properties |
| 3. | Explain the different principles from physics involved in textiles. |
| 4. | Explain the different methods of measurement and calculate the different quantities of physics involved in textiles |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | **Elasticity:** Stress, strain, Hooke's Law of elasticity, Breaking stress, Working stress, Factor of safety, Resilience. Some peculiar traits and Factors affecting elasticity. Young's modulus, bulk Modulus and Modulus of rigidity. Relation between Y, $\eta$ and K. Poission's ratio, relation between K, $\eta$ and Poission's ratio. Twisting couple on a cylinder (for wire). Torsional rigidity. | 7 |
| Unit 2. | **Viscosity:** Newton's Law of viscosity. Streamline & Turbulent flow, Critical velocity, Significance of Reynold's number. Stokes law. Terminal velocity and its expression. Poiseuille"s equation for flow of a liquid through a horizontal capillary tube. Experimental determination of $\eta$ for a liquid by Poiseuille's method, Ostawald viscometer Applications of viscosity. | 6 |
| Unit 3. | **Friction and Surface Tension:** Types of friction, Laws of friction, Angle of friction, acceleration down an inclined plane. Rope brake, Proof of $T_2/T_1 = e^{\mu\Theta}$. Molecular theory of surface tension. Surface energy, Angle of contact, | 6 |

| | | |
|---|---|---|
| | capillary rise. Excess pressure inside a liquid drop, Soap bubble and inside a curved membrane of any shape. Applications of surface tension. | |
| Unit 4. | **Optics**: <br> Laws of refraction, refractive index, total internal reflection. Magnifying Power and Resolving power. Construction & working of electron microscope. Polarization of light, Double refraction, Nicol prism, Quarter wave and Half wave plate. Production and detection of circularly and Elliptically polarized light. | 7 |
| Unit 5. | **Crystalline solids and characterization by X-rays** <br> Production of x-rays by modern Coolidge tube, Properties and Applications of X-rays. X-ray spectrum. Seven crystal systems, miller Indices. Bragg's law and Bragg's x-ray spectrometer. | 7 |
| Unit 6. | **Laser and Photoelectric effect:** <br> Laser, Characteristics and Applications of Laser. Spontaneous, Stimulated emission and Ruby Laser. Photoelectric effect, Einstein's equation of photoelectric equation. Factors affecting the photoelectric effect. Study of various photocells. Use of photo sensors. | 6 |

| Reference Books | |
|---|---|
| 1 | Elements of Properties of Matter by D.S. Mathur |
| 2 | Engineering Physics by B.L. Theraja |
| 3 | Engineering Physics by R.K. Gour& Gupta |
| 4 | Physics for Engineers by M.R. Srinivasan |
| 5 | Text Book of Optics by Brijlal & Subramanyam |
| 6 | Optics by A.K. Ghatak |

**First Year B. Tech. Semester – I**
**TTL163: ENGINEERING GRAPHICS**

| Teaching Scheme | | | Evaluation Scheme | |
|---|---|---|---|---|
| Lectures | 2 Hrs. /Week | | SE-I | 25 |
| Total Credits | 2 | | SE-II | 25 |
| | | | SEE | 50 |
| | | | Total | 100 |

| Course Objectives | |
|---|---|
| 1. | To understand procedure for converting a pictorial view into orthographic view. |
| 2. | To understand procedure for converting an orthographic view in to isometric view. |
| 3. | To understand procedure for drawing Development and anti-development of solids such as cone, cylinder, prism and pyramid. |
| 4. | To study IS convections for various materials and mechanical elements, free hand sketches of various mechanisms used in textile machines. To know the use of Auto-CAD Commands. |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Draw orthographic views from a given pictorial view. |
| 2. | Draw isometric view from given orthographic views. |
| 3. | Draw Development and anti-development of solids such as cone, cylinder, prism and pyramid. |
| 4. | Draw IS convections for various materials and mechanical elements, free hand sketches of various mechanisms used in textile machines. To write Commands for various entities in Auto-CAD. |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | **Introduction & use of instruments:** Line, Lettering, Conventions of section lines, I.S. conventions of machine parts like knurling, square end of shaft, bearing, springs, external & internal thread. | **3** |
| Unit 2. | **Introduction to Projection of Points, Lines, Planes, Solids and Section of Solids** | **4** |
| Unit 3. | **Orthographic Projections and Sectional Orthographic views:** General principles, First angle method, Third angle method, Dimensioning, Cutting plane, Types of sections, drawing sectional views of machine components. | **5** |
| Unit 4. | **Isometric Projections:** Principle, Isometric scale, Isometric views, Making Isometric drawings of simple objects from orthographic views. | **7** |

| Unit 5. | **Development of Surfaces:** Introduction to solids (Types of solids only), Development of lateral surfaces of cubes, prisms, pyramids, cylinders & cones. | **7** |
| Unit 6. | **Free hand sketches & Introduction to Auto- CAD** Making free hand sketches of various textile machine parts & mechanisms used in spinning, weaving, processing, garments. Commands for drawing lines, circles, polygons, ellipse etc. | **3** |

| Reference Books | |
|---|---|
| 1 | Engineering Drawing by N. D. Bhatt & V. M. Panchal. |
| 2 | Engineering Drawing by Venugopal. |
| 3 | Machine Drawing by N. D. Bhatt & V. M. Panchal. |
| 4 | Machine Drawing by K. L. Narayana, Kannaiah P., K. Venkata Reddy. |
| 5 | Principles of Weaving by Marks & Robinson. |
| 6 | Engineering Graphics by H. G. Phakatkar |

**First Year B. Tech. Semester – I**
**TTL164:  TEXTILE FIBRES**

| Teaching Scheme | |
|---|---|
| Lectures | 3 Hrs. / Week |
| Total Credits | 3 |

| Evaluation Scheme | |
|---|---|
| SE-I | 25 |
| SE-II | 25 |
| SEE | 50 |
| Total | 100 |

| Course Objectives | |
|---|---|
| 1. | To explain the basics of textile fibres |
| 2. | To describe the morphological and chemical structure of natural fibres |
| 3. | To describe the manufacturing processes of manmade fibres |
| 4. | To explain the properties of natural and manmade fibres |

| Course Outcomes | |
|---|---|
| At the end of the course, students will be able to | |
| 1. | Explain the basics of textile fibres |
| 2. | Describe the morphological and chemical structure of natural fibres |
| 3. | Demonstrate the manufacturing processes of manmade fibres |
| 4. | Enunciate properties of natural and manmade fibres |

| Unit | Course Contents | Hrs. |
|---|---|---|
| **Unit 1.** | **Introduction**<br>a. **Concepts of:** Fibre, Yarn, Fabric, Staple fibre, Filament, Regenerated fibre, Degree of polymerization, Crystallinity, Orientation.<br>b. Classification of fibres.<br>c. Advantages and disadvantages of natural & manmade fibres.<br>d. Characteristics of fibre forming polymer.<br>e. The requirement of fibre formation.<br>f. Introduction to Textile Value Chain. | 5 |
| **Unit 2.** | **Vegetable Fibres**<br>a. **Cotton Fibre:** Cultivation and harvesting, Development of fibre in seed, Morphological structure, Properties and applications of Cotton fibre.<br>b. **Bast Fibres:** Retting and extraction process of Bast fibres, Properties and applications of Jute fibres.<br>c. **Introduction to other vegetable fibres** | 7 |
| **Unit 3.** | **Animal Fibres**<br>a.  **Wool**: Types and grading of wool, Morphological structure, Properties and applications. | 7 |

| | | |
|---|---|---|
| | b. **Silk:** Types of silk, Production of silk, Morphological structure, Properties and applications. | |
| **Unit 4.** | **Manmade Fibre Formation Technologies**<br>   a. Melt Spinning<br>   b. Dry Spinning<br>   c. Wet Spinning<br>   d. Comparison between different man-made fibre formation technologies. | 4 |
| **Unit 5.** | **Manmade Fibres**<br>   a. **Polyamide Fibres (Nylon 6 & Nylon 66):** Manufacturing process, Properties and applications.<br>   b. **Polyester (Polyethylene Terephthalate):** Manufacturing process, Properties and applications.<br>   c. **Polyolefin Fibres (Polypropylene):** Manufacturing process, Properties and applications.<br>   d. **Polyacrylonitrile Fibre:** Manufacturing process, Properties and applications.<br>   e. **Polyurethane Fibres:** Extensibility and recovery mechanism, Manufacturing process, Properties and applications | 12 |
| **Unit 6.** | **Regenerated Fibres**<br>   a. **Viscose Rayon:** Manufacturing process, Properties and applications.<br>   b. **Introduction to other regenerated fibres** | 4 |

| Reference Books | |
|---|---|
| 1 | ACIMIT – Italy, Reference Book of Textile Technology - Man-made Fibres (2011). |
| 2 | J. Gordon Cook, Handbook of Textile Fibres. Volume 1 Natural Fibres, Woodhead Publishing Series in Textiles ISBN:978-1-85573-484-5 (1984). |
| 3 | J. Gordon Cook, Handbook of Textile Fibres. Volume 2 Man-Made Fibres, Woodhead Publishing Series in Textiles, ISBN: 978-1-85573-485-2 (1984). |
| 4 | Murthy, H. V. Sreenivasa, Introduction to Textile Fibres, Woodhead Publishing India in Textiles, ISBN:978-93-85059-57-5 (1984). |
| 5 | S.P. Mishra, A Textbook of Fibre Science and Technology, New Age International (P.) Limited, ISBN: 9788122412505 (2000). |
| 6 | R. W. Moncrieff, Man-made Fibres, Heywood Books, Open Library-OL5656433M (1966). |
| 7 | V. R. Gowariker, Polymer Science, New Age International Publishers; Third edition, ISBN: 9387788644, (1 January 2019). |

**First Year B. Tech. Semester – I**
**TTL165: YARN FORMING TECHNOLOGY- I**

| Teaching Scheme | | | Evaluation Scheme | |
|---|---|---|---|---|
| Lectures | 3 Hrs. /Week | | SE-I | 25 |
| Total Credits | 3 | | SE-II | 25 |
| | | | SEE | 50 |
| | | | Total | **100** |

| Course Objectives | |
|---|---|
| 1. | To explain basic fibre properties and staple yarn spinning processes. |
| 2. | To explain basics and conversions related to yarn numbering system. |
| 3. | To explain the process and methods used for cotton cultivation and harvesting. |
| 4. | To explain cotton Ginning technology and Techniques. |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Understand fibre properties, operations and mechanisms of staple yarn spinning. |
| 2. | Understand the yarn numbering system and related calculations. |
| 3. | Understand the process and methods used for cotton cultivation and harvesting. |
| 4. | Understand cotton Ginning technology and Techniques. |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | Definition of terms – Textiles, Fibres, Staple fibre, Filament, Staple yarn, Filament yarn. Classification of yarns. Essential and desirable properties of fibres and their impact on staple spinning Process flow chart for Ring, Rotor and Air-jet yarn manufacturing. Objects of each machine in spinning process. | **8 Hrs.** |
| Unit 2. | Yarn numbering systems – Introduction, Importance, Direct and Indirect yarn numbering systems. Related calculations. Resultant yarn count calculations. | **8 Hrs.** |
| Unit 3. | Indian Cotton Cultivation. Factors affecting the cotton cultivation. Spinnability of Varieties of different cottons. Cotton Harvesting – Factors affecting the cotton harvesting, Types of harvesting, Process of Defoliation. | **6 Hrs.** |
| Unit 4. | Pre and post Ginning Process – Objects, machines used and their importance | **4 Hrs.** |
| Unit 5. | Introduction of ginning process, | **5 Hrs.** |

| | | |
|---|---|---|
| | Construction and working of different ginning machines | |
| **Unit 6.** | Factors affecting ginning performance – Machine Factors, Agricultural Factors and Material Factors. Effect of ginning on fiber and yarn properties Pressing and bailing of cotton – Importance, Method and characteristics of Indian bales | **8 Hrs.** |

| **Reference Books** | |
|---|---|
| 1 | The Textile Institute Publication - Manual of Textile Technology – Short Staple Spinning Series by W. Klein |
| 2 | The Characteristics of Raw Cotton' by P. Lord. The Textile Institute Publication, Manual of Cotton Spinning Vol.II, Part-I. |
| 3 | 'Opening and Cleaning' by Shirley. The Textile Institute Publication, Manual of Cotton Spinning Vol. II, Part-II. |
| 4 | Opening Cleaning and Picking' by Dr.Zoltan S. Szaloki, Institute of Textile Technology, Virginia. |
| 5 | 'Cotton Ginning' Textile Progress, The Textile Institute Publication. |
| 6 | Blow room and Carding- Training Program conducted by NCUTE, IIT, Delhi. |
| 7 | 'Cotton Production and Blow Room' By Dr. R. N. Narkhedkar, Research India Publication, Delhi. |
| 8 | Essential calculations of practical cotton spinning by T.K. Pattabhiraman |
| 9 | The Textile Institute Publication - Manual of Textile Technology – Short Staple Spinning Series by W. Klein |

## First Year B. Tech. Semester – I
## TTP166: ENGINEERING GRAPHICS LAB

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Practical | 2 Hrs. /Week | CIE | 50 |
| Total Credits | 1 | Total | **50** |

| List of Experiments | |
|---|---|
| 1. | Lines, Letterings & Dimensioning. |
| 2. | Conventions of section lines & I.S. conventions of machine parts. |
| 3. | Projection of Points and Lines,  Auxiliary Plane Method |
| 4. | Projection of Planes, Auxiliary Plane Method |
| 5. | Projection of Solids, Auxiliary Plane Method |
| 6. | Projection of Section of Solids, Auxiliary Plane Method |
| 7. | Conversion of pictorial view into orthographic views. |
| 8. | Conversion of pictorial view into sectional orthographic views. |
| 9. | Free hand sketches of textile machine parts & mechanisms. |
| 10. | Isometric Projections. |
| 11. | Development of Surfaces |
| 12. | Autocad Commands |

**Submission – Completed Journal.**

**First Year B. Tech. Semester – I**
**TTP167: YARN FORMING TECHNOLOGY-I LAB**

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Practical | 2 Hrs. / Week | CIE | 50 |
| Total Credits | 1 | Total | 50 |

| List of Experiments | |
|---|---|
| 1. | Layout of spinning work shop. |
| 2. | Study of different types of drives and calculations. |
| 3. | Study of various types of bearings used on spinning machines. |
| 4. | Process Flow chart for carded and combed yarn manufacturing |
| 5. | Process Flow chart for Air jet, Rotor yarn manufacturing |
| 6. | Testing of hank produced from Preparatory Machines. |
| 7. | Testing of hank produced from Spinning Machines. |
| 8. | Study of ginning machine: Construction, Working |
| 9. | Calculation of machine cleaning efficiency. |
| 10. | Study of Blow-room line - Flow chart - Machine positioning in Blow-room. |
| 11. | Mill visit I - (Collection of different types of yarns) |
| 12. | Mill visit II |

**Submission – Completed Journal.**

**First Year B. Tech. Semester – I**
**TTP168**:  FUNDAMENTALS OF COMPUTER AND PROGRAMMING LAB

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Practical | 2 Hrs. / Week | CIE | 50 |
| Total Credits | 1 | Total | 50 |

| Course Objectives | |
|---|---|
| 1. | To describe basic Computer architecture and Generation of computers. |
| 2. | To explain operating system concept with its structure and features |
| 3. | To illustrate scripting language and programming |
| 4. | To explain basic structure of 'C' programming and formation, implementation, discuss about online platform |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Understand basic of computer architecture and generation of computer. |
| 2. | Understand basic of operating system and programming language |
| 3. | Design and implement web pages using scripting language. |
| 4. | Understand programming concept and develop simple application programs in 'C' Language. Understand of online platform |

| | Course Contents | Hrs. |
|---|---|---|
| **Unit 1. Introduction to Computers** | **Introduction:**  Characteristics of Computers, Block diagram of computer. Types of computers and features, Mini Computers, Micro Computers, Mainframe Computers, Super Computers. Types of Programming Languages (Machine Languages, Assembly Languages, High Level Languages). Data Organization, Drives, Files, Directories. Types of Memory (Primary and Secondary) RAM, ROM, PROM, and EPROM. Secondary Storage Devices (FD, CD, HD, Pen drive), I/O Devices (Scanners, Plotters, LCD, Plasma Display), Number Systems Introduction to Binary, Octal, Hexadecimal number system Conversion, Simple Addition, Subtraction, Multiplication using number system. | **6** |
| **Unit 2. Computer Software** | **Operating System:** Types of operating system, Functions, Unix/Linux, Windows 7/Windows 8-structures & features, Unix/Linux commands: Listing, changing, copying and moving files & directories (LS, CD, CAT, MKDIR, RMDIR, and other commands), any editor in Linux. Application Software's: Word processor, spreadsheets, presentation, application, DBMS, etc. | **6** |
| **Unit 3. Dynamic Web Page** | **HTML**: use of commenting, headers, text styling, images, formatting text with <FONT>, special characters, horizontal rules, line breaks, table, forms, image maps, <META> tags, <FRAMESET> tags, file | **4** |

| Design | formats including image formats. Introduction to VB script, basics of VB scripting, Java script. | |
|---|---|---|
| **Unit 4. Programming with 'C' Language** | **Introduction to 'C' Programming**: Algorithm & flowchart, keywords, statements, Loops, Array representation, one dimensional array, structure, define structure variable, accessing structure member, pointer, pointer arithmetic, pointer & array. | **6** |
| **Unit 5. Online Platform** | Online Meeting, online Presentation, online exam, online webinars, online study platforms. | **4** |

| Reference Books | |
|---|---|
| 1 | Fundamentals of Computers by V. Rajaram, PHI Publications. |
| 2 | Introduction to Information Technology, ITL Education Solutions LTD. Pearson Education |
| 3 | Let us C by Y.P. Kanetkar, BPB Publication |
| 4 | Beginning Java Script ,4Ed by Jeremy Mcpeak Paul Wilton |

| List of Experiments | |
|---|---|
| 1. | Study of basic parts of Computer System |
| 2. | Study of Linux Commands |
| 3. | Create spreadsheet application to manipulate numbers, formula and graphs in Linux/MS Office |
| 4. | Create a Power Point presentation application using Text, Image, Animation using Linux/MS Office |
| 5. | Create a simple personal web page using HTML |
| 6. | Create a simple web page using VB Script |
| 7. | Program for Addition, subtraction, Multiplication, Division of two numbers using C Language in Linux Platform |
| 8. | Program for different types of loops using C Language in Linux Platform |
| 9. | Program for one-dimensional array using C Language in Linux Platform |
| 10. | Program for two-dimensional array using C Language in Linux Platform |
| 11. | Study of Online Platform-I |
| 12. | Study of Online Platform-II |

**Submission – Completed Journal.**

**First Year B.Tech Textile Technology**
**Semester-II**

| Sr. No. | Course Code | Name of the Course | Group | Theory Hrs/ Week | Tutorial Hrs/ Week | Practical Hrs/ Week | Total | Credits |
|---------|-------------|---------------------|-------|------------------|--------------------|---------------------|-------|---------|
| 1 | TTL171 | Textile Mathematics - II | B | 3 | | | 3 | 3 |
| 2 | TTL172 | Applied Mechanics | C | 3 | | | 3 | 3 |
| 3 | TTL173 | Electrical Technology | C | 3 | | | 3 | 3 |
| 4 | TTL174 | Fabric Forming Technology - I | D | 3 | | | 3 | 3 |
| 5 | TTL175 | Industrial Chemistry | B | 3 | | | 3 | 3 |
| 6 | TTP176 | Electrical Technology Lab | C | | | 2 | 2 | 1 |
| 7 | TTP177 | Fabric Forming Technology - I Lab | D | | | 2 | 2 | 1 |
| 8 | TTP178 | Industrial Chemistry Lab | B | | | 2 | 2 | 1 |
| 9 | TTP179 | Professional Communication Lab | A | 1 | | 2 | 3 | 2 |
| 10 | | **Democracy, Election and Good Governance \*** | H | | | | | NP/NF |
| **Total** | | | | **16** | **0** | **8** | **24** | **20** |

**Group Details**

A:  Humanities, Social Science & Management

B:  Basic Science

C:  Engineering Science

D:  Professional Core Courses

E:  Professional Electives

F:  Open Elective

G:  Project / Seminar / Internship

H:  Mandatory non-Credit Courses

**First Year B. Tech. Semester – II**
**TTL171: TEXTILE MATHEMATICS- II**

| Teaching Scheme | |
|---|---|
| Lectures | 3Hrs. / Week |
| Total Credits | 3 |
| | |
| | |

| Evaluation Scheme | |
|---|---|
| SE-I | 25 |
| SE-II | 25 |
| SEE | 50 |
| Total | 100 |

| Course Objectives | |
|---|---|
| 1. | Prepare students so that they can understand mathematical rules used in tracing cartesian and polar curves. |
| 2. | Prepare students with the definition, methods related to reduction formulae, special functions, multiple integrals and its applications |
| 3. | Prepare students with statistical methods so that they can understand analysis of bivariate data, correlation and regression. |
| 4. | Prepare students to understand probability, random variable and probability distributions. Also, to solve textile engineering problems using probability distributions. |

| Course Outcomes | |
|---|---|
| At the end of the course students have understood | |
| 1. | Rules of tracing cartesian and polar curves. Also, they are able for trace curves. |
| 2. | the theory, definition and properties of reduction formulae, special functions, multiple integrals and its applications. Also, they are able to use them to solve the problems of area, mass of lamina and volume. |
| 3. | the bivariate data, definition of correlation and properties of correlation coefficients, concept of regression, types and regression equations. Also, they are able to find coefficient of correlation, equations of regression with interpretation. |
| 4. | the concept of random variable with type and probability distribution of random variable with types. Also, they are able to solve textile problems using Binomial, Poisson and Normal probability distributions |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | Curve Tracing: Rules & examples of curve tracing in Cartesian and Polar Equations only | 5 |
| Unit 2. | Integral Calculus: Reduction formulae of sine and cosine functions, Gamma function, Beta Function, <br> Multiple integrals: Introduction, solution, change of order & Change of variables method. | 8 |
| Unit 3. | Applications of integration: Area, Mass of lamina using double integrals only. Volume using triple integral only | 6 |

| Unit 4. | Bivariate data: Correlation: Definition, types, coefficient of correlation, properties & interpretation. Rank correlation coefficient & computation and interpretation. Regression: Regression concept and types. Lines of regression X on Y & Y on X, regression coefficients with properties & computation. | 7 |
|---|---|---|
| Unit 5. | Probability distribution: Introduction of probability and its basic laws. Random variable: Definition, types. Introduction of probability distribution, types of probability distribution, pmf & pdf, expectation of random variable. MGF of random variable. Standard discrete probability distributions: Binomial probability distribution: Definition, properties, fitting & examples. Poisson probability distribution: Definition, properties, fitting & examples | 7 |
| Unit 6. | Standard continuous probability distributions: Normal probability distribution: Definition, properties, standard normal distribution & examples. Chi-square probability distribution ($\chi^2$): Definition & properties only. t-probability distribution: Definition & properties only. F-probability distribution: Definition & properties only. Introduction of statistical table for Z, t, $\chi^2$, & F. | 6 |

| Reference Books | |
|---|---|
| 1 | A textbook of applied mathematics Vol.-I & II by P.N. & J.N. Wartikar |
| 2 | Higher engineering mathematics by B.S. Grewal |
| 3 | A textbook of applied mathematics by Bali, Saxena & Iyangar. |
| 4 | Mathematical Statistics by J.E. Fruend. |
| 5 | Probability & Statistics for engineers by Johnson. |
| 6 | Statistical methods by Kumbhojkar |

**First Year B. Tech. Semester – II**
**TML172: APPLIED MECHANICS**

| Teaching Scheme | |
|---|---|
| Lectures | 3 Hrs. /Week |
| Total Credits | 3 |
| | |
| | |

| Evaluation Scheme | |
|---|---|
| SE-I | 25 |
| SE-II | 25 |
| SEE | 50 |
| Total | 100 |

| Course Objectives | |
|---|---|
| 1. | To understand the concept of forces and various laws related to force with basic principles, theorems and concepts of mechanics. |
| 2. | To understand the concepts like equilibrium, support reactions, friction, moment of inertia and use of simple machines |
| 3. | To study and analyse the effect of various types of forces on the bodies in static and dynamic conditions. |
| 4. | To interpret the concept of transmission of motion and power in various machines by using various drives and bearings used in textile machines |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Understand the concept of forces and various laws related to force with basic principles, theorems and concepts of mechanics. |
| 2. | Understand the concepts like equilibrium, support reactions, friction, moment of inertia and use of simple machines. |
| 3. | Analyse the effect of various types of forces on the bodies in static and dynamic conditions. |
| 4. | Interpret the concept of transmission of motion and power in various machines by using various drives and bearings used in textile machines |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | **Fundamentals of statics** <br> Statics, dynamics, Fundamental units of measurements, Metric system of units, SI. System, Scalar and Vector quantities. Force, system of forces, Resultant force and equilibrant, principle of transmissibility of force, moment of force. Couple, Law of parallelogram of forces, Varignon's theorem, Composition and resolution of Coplanar concurrent and non-concurrent forces. | 8 |
| Unit 2. | **Equilibrium** <br> Equilibrium of Coplanar forces, Conditions of equilibrium, free body diagram, Lami's theorem. <br> **Friction:** Introduction to friction, types of friction, Laws of friction. Cone | 7 |

| | | |
|---|---|---|
| | of Friction.<br>**Beams:** Types of beams, Types of Loads, Types of supports, Analysis of Simply supported beams. | |
| Unit 3. | **Moment of Inertia**<br>Centroid and Centre of gravity, Centroid of composite areas, Radius of gyration, parallel axis theorem, perpendicular axis theorem, Moment of inertia of composite sections. | 7 |
| Unit 4. | **Lifting Machines**<br>Mechanical advantage, velocity ratio, efficiency, law of machine, effort lost in friction, load lost in friction, Study and numerical examples on simple machines- Simple screw jack, Simple axle and wheel, differential axle and wheel, worm and worm wheel. | 6 |
| Unit 5. | **Kinematics and Kinetics**<br>**Kinematics of Linear motion:** Equations of linear motion with constant and variable acceleration, motion under gravity.<br>**Kinematics of Angular motion:** Relation between angular motion & linear motion, Equations of angular motion, Centrifugal & centripetal forces, Motion along a curved path, Banking of roads.<br>**Kinetics:** Newton's laws of motion, Mass moment of inertia, D'Alemberts principle, work, power, energy, impulse, Work- Energy Principle, Impulse- Momentum Principle, Principle of conservation of energy. | 8 |
| Unit 6. | **Transmission of motion and power**<br>Belt, rope, chain and gear drives, P.I.V. drives, Type of gears and gear drives, Gear trains, velocity ratio, advantages of gear drives, uses in textile machines, Concept of epicyclic gearing. Types of bearing and their applications (Only theory, no numerical examples on this topic) | 6 |

| Reference Books | |
|---|---|
| 1 | Engineering Mechanics by R. K. Bansal and Sanjay Bansal, Laxmi Publications. |
| 2 | Applied Mechanics by R.S. Khurmi, S. Chand Publications. |
| 3 | Engineering Mechanics by S. S. Bhavikatti, New Age International Pvt. Ltd. |
| 4 | Engineering Mechanics by S. Ramamrutham, DhanpatRai and Sons. |
| 5 | Fundamentals of Engineering Mechanics by S. Rajasekaran, Sankarasubramanian, Vikas Publishing House. |
| 6 | Applied Mechanics by S.N. Saluja, SatyaPrakashan, New Delhi |
| 7 | Engineering Mechanics by S. B. Junnarkar, Charotar Publishing House Pvt. Ltd. |
| 8 | Vector Mechanics for Engineers Vol. I & II, by Beer & Jonhstan, Tata Mc-Graw Hill Publication |

**First Year B. Tech. Semester – II**
**TTL173: ELECTRICAL TECHNOLOGY**

| Teaching Scheme | |
|---|---|
| Lectures | 3 Hrs. /Week |
| Total Credits | 3 |

| Evaluation Scheme | |
|---|---|
| SE-I | 25 |
| SE-II | 25 |
| SEE | 50 |
| Total | 100 |

| Course Objectives | |
|---|---|
| 1. | To understand basic concepts involved in electrical & magnetic circuits. |
| 2. | To understand concepts of elements & parameters in single phase and three phase AC circuits. Three phase Induction motor . |
| 3. | To understand working and importance of electrical transformer. |
| 4. | To study different types of electrical accessories, electric earthling & Lamps. Energy auditing and  Power quality . |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Apply the fundamental laws and principles to solve the electrical & magnetic circuits. |
| 2. | Analyse the behaviour of any element with respect to AC supply |
| 3. | Analyse the characteristics behaviour of electrical transformer. |
| 4. | Apply the knowledge of switchgear and lamps in electrical installation. |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | **D. C. Circuit**<br>Basic electrical quantities, Concept of E.M.F, Potential Difference, current, Resistance, Ohm's Law, Kirchhoff's laws, mesh and node analysis, Energy Bill calculation. Numericals | **8** |
| Unit 2. | **Magnetic Circuits**<br>Flux, flux density, Reluctance, field intensity, permeability, mmf, comparison of Electric and Magnetic circuit, leakage and fringing, B-H curve, series magnetic circuits. Numericals. | **6** |
| Unit 3. | **Single Phase A.C. Circuits**<br>Faraday's Laws, Lenz's Law, types of emfs, generation of sinusoidal voltage, R.M.S. & Average value, form factor, peak factor, phasor representation of A.C.  quantities, impedance, R-L, R-C, R-L-C series circuits, powers, power factor and its improvement by capacitor method. Numericals | **8** |
| Unit 4. | **Three Phase A.C. Circuits**<br>Introduction to three phase supply and its advantages, Generation of three phase A.C. voltage, balanced system, relation between line and phase | **8** |

| | | |
|---|---|---|
| | quantities in star and delta. Numericals. Three Phase Induction Motor Working Principle, Constructional Details, Types, Rotating Magnetic Field Theory. Speed Control Methods, Necessity of starters, Types of Starters, modern starter variable Frequency Drive (VFD), application in Textile Industry | |
| **Unit 5.** | **Single Phase Transformer**<br>Construction, operating principle, Types, EMF equation, Concept of Ideal Transformer, Transformation Ratio, operation on no load and with load, losses, efficiency, voltage regulation, testing, applications. Numericals. | **6** |
| **Unit 6.** | **Electrical Switchgear and Lamps , Power Quality , Energy Audit**<br>Necessity of Earthing, Earthing methods, Fuse (rewireble and HRC), MCB, Fluorescent tube, CFL, Mercury vapour lamp, LED lamp, single line diagram of electrical system. Introduction of energy audit, power quality, Harmonics concept of energy efficient lighting system & motors [ EEM ] | **6** |

| Reference Books | |
|---|---|
| 1 | Elements of electrical Engineering by U.A. Bakshi |
| 2 | Electrical Technology by U.A. Bakshi |
| 3 | Basic Electrical Engineering by B. H. Deshmukh. |
| 4 | A text book in electrical technology by B. L. Thareja |
| 5 | Fundamentals of Electrical Engineering by Ashfaq Husain |
| 6 | Elements of electrical Engineering by U.A. Bakshi |

**First Year B. Tech. Semester – II**
**TTL174: FABRIC FORMING TECHONOLOGY- I**

| Teaching Scheme | |
|---|---|
| Lectures | 3 Hrs. / Week |
| Total Credits | 3 |
| | |
| | |

| Evaluation Scheme | |
|---|---|
| SE-I | 25 |
| SE-II | 25 |
| SEE | 50 |
| Total | 100 |

| Course Objectives | |
|---|---|
| 1. | To describe the Textile Industry in India and explain the object of all weaving preparatory processes |
| 2. | To explain various motions of a plain loom, production and fabric weight calculations |
| 3. | To explain various motions on loom like dobby, drop box and jacquard. |
| 4. | To explain method of fabric analysis and also to describe the identification and construction of basic weaves and it's derivatives as well as the towel weaves |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Describe the Textile Industry in India and explain the object of all weaving preparatory processes. |
| 2. | Explain various motions of a plain loom, production and fabric weight calculations. |
| 3. | Explain various motions on loom like dobby, drop box and jacquard. |
| 4. | Explain method of fabric analysis and also to describe the identification and construction of basic weaves and it's derivatives as well as the towel weaves |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | **Introduction**<br>1. Nature of textile industry in India<br>2. Various methods of fabric forming: - Weaving, knitting, braiding, non-woven, brief description of all methods, processes involved in it and their applications.<br>3. Weaving processes: objects of all processes. Different kinds of fabrics: Grey, mono-colour, multi-colour, warp or weft stripes, checks.<br>4. Process flow charts for various fabrics | 06 |
| Unit 2. | **Fabric Forming**<br>1. Outline of weaving mechanisms: - Classification of weaving machines, Basic motions, primary, secondary and auxiliary, objects,<br>2. Primary motions: Detailed study of -shedding, picking, and beat- up<br>3. Secondary motions: Detailed study of take up and negative let-off. | 10 |

| | | |
|---|---|---|
| | 4. Auxiliary motions: - Detailed study of weft fork, anti-crack, oscillating backrest, warp-protecting motions and temples. | |
| **Unit 3.** | Weaving:<br>1. Study of dobby: Types of dobby, cliamax, cam dobby, method of pegging.<br>2. Study of jacquard: types of jacquards, sizes and figuring capacities of jacquard, harness ties.<br>3. Weft patterning: study of drop box motion, pattern chain and card saving. | **08** |
| **Unit 4.** | **Fabric structure**<br>1.    Constructional details:  - Warp and weft count, thread densities, width, length, selvedge; light, medium, & heavy constructions, warp and weft cover, cloth cover, crimp, contraction in warp and weft way during weaving, introduction to interlacement of thread.<br>2.  Presentation of weaves: - Design, draft & its types, peg plan, need and importance.<br>3.  Study of basic weaves and its derivatives: - plain, twill and satin | **10** |
| **Unit 5.** | **Towel and other weaves:**<br>1. Toweling structures: ordinary and brighten honeycomb, huck a back, mock leno.<br>2. Crepe by various methods | **04** |
| **Unit 6.** | **Calculations:**<br>Fabric Forming:  Warp weight, weft weight, fabric weight per sq.m, fabric production/loom. | **02** |

| **Reference Books** | |
|---|---|
| 1 | 1. Weaving Mechanism by K.T. Aswani. |
| 2 | 2. Principles of weaving By Marks A.T.C. & Robinson |
| 3 | 3. Textile Colour and Design By Watson |
| 4 | 4. Weaving  By Prof. D. B. Ajgaonkar, Prof. Sriramalu & Prof. M. K. Talukdar |
| 5 | 5. Weaving Calculation by Sengupta |
| 6 | 6. Textile Mathematics-Vol. I by J.E. Booth |

# First Year B. Tech. Semester – II
## TTL175: INDUSTRIAL CHEMISTRY

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Lectures | 3.Hrs. / Week | SE-I | 25 |
| Total Credits | 3 | SE-II | 25 |
| | | SEE | 25 |
| | | Total | 100 |

| Course Objectives | |
|---|---|
| 1. | To explain water quality parameters, water treatment methods and surfactants. |
| 2. | To explain organic polymer, abrasives and refractories. |
| 3. | To explain the metallic materials, corrosion and its prevention. |
| 4. | To describe characteristics of fuels, fuel cells and determine calorific value of fuels. |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to, | |
| 1. | Explain water quality parameters and select water treatment methods and surfactants. |
| 2. | Select appropriate polymers, abrasives and refractories in industries and society. |
| 3. | Describe the metallic material and prevent corrosion in industries and society. |
| 4. | Evaluate the quality of fuels and select the proper fuels, fuel cells and batteries. |

| | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | **Water** <br> Introduction, impurities in natural water, water quality parameters: pH, acidity, alkalinity, total solids, BOD, COD, hardness- definition, types, units and numerical problems, ill effects of hard water in textile industry, boiler feed water, causes & disadvantages of scale and sludge formation, priming, foaming and caustic embrittlement, treatment of water by zeolite process, ion exchange process, reverse osmosis. | 7 |
| Unit 2. | **Organic Polymer** <br> **i) Natural Polymer-** Introduction, **starch**: sources, constitution, properties; properties of starch paste: soluble starch and dextrin, action of enzymes, manufacture of starch from maize, **cellulose**: sources, constitution, chemical and physical properties. <br> **ii) Synthetic Polymer -**Synthesis and applications of phenol formaldehyde and urea formaldehyde resins. | 6 |
| Unit 3. | **Surfactant** <br> Introduction to surfactant and bio-surfactant. <br> Soaps and Detergents: Introduction, definition of soap, Saponification. Difference between Soaps and Detergents. Detergency and its mechanism, classification: anionic, cationic, non-ionic and amphoteric | 6 |

| | | |
|---|---|---|
| | detergents, synthesis of detergents, concept of micro emulsions, use of micro emulsions, applications in textiles. | |
| Unit 4. | **Metallic Materials and Corrosion** <br><br> Introduction to metallic materials, alloys: definition, classification, purposes of making alloys, composition, properties and applications of ferrous alloys: plain carbon steels, stainless steel, nonferrous alloys: brass and bronze. <br><br> Introduction to corrosion, definition, causes, classification, types of oxide films on metal surfaces, atmospheric corrosion, electrochemical corrosion and mechanisms, factors affecting the rate of corrosion, prevention of corrosion by cathodic protection, hot dipping-Galvanizing and Tinning . | 7 |
| Unit 5. | **Abrasives and Refractories** <br><br> Introduction to abrasives, Natural abrasives- Diamond, Corundum, Emery, Garnets, Quartz. Artificial abrasives- Carborandom, Boron Carbide. Introduction and classification of refractories, Properties of refractories, Manufacturing of refractories, Refractory bricks- Zirconia, High -Alumina, Chromite. | 6 |
| Unit 6. | **Fuels and Fuel Cells** <br><br> Introduction, classification, properties, characteristics of good fuel, comparison between solid, liquid and gaseous fuels, determination of calorific value by Bomb and Boy's calorimeter, numerical problems. <br> **Fuel cells**: Definition, classification, advantages and disadvantages of fuel cells. Construction, working and applications of $H_2$-$O_2$ cell. <br> **Batteries:** Introduction, construction, working and applications of $ZnMnO_2$ and $LiMnO_2$. | 7 |

| **Reference Books** | |
|---|---|
| 1 | Engineering Chemistry by Jain and Jain. |
| 2 | Chemistry of Organic Textile Chemicals by Dr. V.A. Shenai |
| 3 | Text Book of Engineering Chemistry by Shashi Chawla. |
| 4 | A Text Book of Engineering Chemistry by S. S. Dara |
| 5 | Surfactants and Polymers in Aqueous Solutions by J., Lindman and H., Kronberg. |
| 6 | Textbook of Quantitative Chemical Analysis by G. H. Jeffery, J. Bassett, J. Mendham, R. C Denny. |

## First Year B. Tech. Semester – II
## TTP176:  ELECTRICAL TECHNOLOGY LAB

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Practical | 2 Hrs. /Week | CIE | 50 |
| Total Credits | 1 | Total | 50 |

| List of Experiments | |
|---|---|
| 1. | General Introduction to Electrical Engineering laboratory. |
| 2. | Verification of Ohm's Laws. |
| 3. | Verification of Kirchhoff' Current Law. |
| 4. | Verification of Kirchhoff' Voltage Law. |
| 5. | Determination of Power factor in ac circuit. |
| 6. | Determination of Resistance & Inductance of a coil. |
| 7. | Study of Phasor Relationship in R-L-C series circuit. |
| 8. | Verification of phase and line parameters in three phase system. |
| 9. | Determination of Efficiency and Regulation of Single Phase Transformer. |
| 10. | Study of different types of Earthing. |
| 11. | Study of different types of Protective devices. |
| 12. | Study of different types of lamps. |

**Submission – Completed Journal.**

## First Year B. Tech. Semester – II
## TTP177: FABRIC FORMING TECHNOLOGY- I LAB

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Practical | 2 Hrs. / Week | CIE | 50 |
| Total Credits | 2 | Total | 50 |

| List of Experiments | |
|---|---|
| 1. | Study of weaving preparatory and weaving process flow charts. |
| 2. | study of passage of yarn through plain loom. |
| 3. | Study of primary motions on plain loom. |
| 4. | Study of secondary motions on loom. |
| 5. | Study of auxiliary motions on loom. |
| 6. | Study of cliamax dobby and pattern chain making. |
| 7. | Study of drop box motion on loom. |
| 8. | Study of mechanical jacquard. |
| 9. | Fabric structure: plain and its derivative. |
| 10. | Fabric structure: twill and its derivative. |
| 11. | Fabric structure: satin/sateen, toweling weave. |
| 12. | Mill visit for plain loom shed. |

**Submission – Completed Journal.**

**First Year B. Tech. Semester – II**
**TTP178:  INDUSTRIAL CHEMISTRY LAB**

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Practical | 2 Hrs. / Week | CIE | 50 |
| Total Credits | 1 | Total | 50 |

| List of Experiments | |
|---|---|
| 1. | Determination of total hardness of water by EDTA method. |
| 2. | Determination of total alkalinity of water. |
| 3. | Estimation of $Na_2Co_3$ and NaOH from mixture |
| 4. | Determination of total acidity of water |
| 5. | Determination of chloride content of water by Mohr's method |
| 6. | Determination of dissolved oxygen of water. |
| 7. | Determination of COD of water. |
| 8. | Determination of pH of solutions. |
| 9. | Determination of total solids & suspended solids of water. |
| 10. | Analysis of starch. |
| 11. | Preparation of urea-formaldehyde resin |
| 12. | Preparation of phenol-formaldehyde resin |
| 13. | Estimation of SAP value of oil. |
| 14. | Determination of rate of corrosion of metal. |
| 15. | Estimation of copper in bronze. |
| 16. | Estimation of copper in brass. |
| 17. | Proximate analysis of solid fuel. |

**Submission – Completed Journal.**

**First Year B. Tech. Semester – II**
**TTP179: PROFESSIONAL COMMUNICATION LAB**

| Teaching Scheme | | Evaluation Scheme | |
|---|---|---|---|
| Lectures | 1 Hrs. / Week | CIE | 50 |
| Practical | 2 Hrs. / Week | Total | 50 |
| Total Credits | 2 | | |

| Course Objectives | |
|---|---|
| 1. | To help students to understand basic concepts of communication and life skills. |
| 2. | To help them communicate effectively and to present their ideas in a rational and logical manner. |
| 3. | To apply effective writing skills widely practiced everywhere. |
| 4. | To make them aware of professional skills along with grammar and vocabulary. |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Understand the importance of communication and life skills which is beneficial for them throughout life. |
| 2. | To exhibit oratorical skills by giving oral presentations. |
| 3. | Demonstrate writing skills through letters, emails and job applications. |
| 4. | Make use of English language with grammatical accuracy and apply professional skills. |

| Unit | Course Contents | Hrs. |
|---|---|---|
| Unit 1. | **Understanding Communication**:<br>Meaning of communication, Process of communication – idea or source, sender, encoding process, message, medium or channel, noise, receiver, decoding process, feedback,-Barriers to Communication – Physical barriers – mechanical barriers –socio-cultural - psychological barriers – linguistic and semantics barriers, Forms of Communication – Formal and informal communication-Oral and written communication<br> upward, downward, horizontal, grapevine-Verbal Communication<br>Non Verbal Communication – appearance – gestures – facial expressions-postures – kinesics – eye contact – silence – haptic – proxemics – paralinguistic | 2 |
| Unit 2. | **Fundamentals of English**:<br>Tenses-vocabulary - Parts of speech – Basic sentences. | 2 |
| Unit 3. | **Business Correspondence**<br> Simple application letter drafting-<br>Application and resume writing. -Email writing. | 2 |
| Unit 4. | **Oratorical Efficiency** | 3 |

| | | |
|---|---|---|
| | The phonemic alphabet in English: vowel sounds – short vowels – long vowels – diphthongs and tripthongs -Consonantal sounds Extempore - Elocution – Debate – -Presentation techniques. | |
| Unit 5. | **Life Skills:** Developing Positive attitude -Decision Making Skills - Leadership Skills - Emotional Intelligence - Time Management - Team Work. | **2** |
| Unit 6. | **Professional skills** Group discussion: meaning –types- rules- judging criteria -Interview Techniques: types- rules- judging criteria. | **2** |

| **Reference Books** | |
|---|---|
| 1 | Soft Skills for Managers by Dr. T. KalyanaChakravarthi, Dr. T. LathaChakravarthi, Biztantra. |
| 2 | Communication skills for engineers by Sunita Mishra. |
| 3 | Soft Skills for every one by Jeff Butterfield, Cengage |
| 4 | Body Language by Allen Pease |
| 5 | Speaking Accurately by K.C. Nambiar, Cambridge University Press New Delhi. |
| 6 | Speaking Effectively by Jeremy Comfort, Pamela Rogerson, and Cambridge |

| **List of Experiments** | |
|---|---|
| 1. | Understanding Self or About myself |
| 2. | Grammatical activities |
| 3. | Simple application letter |
| 4. | Job application and resume writing |
| 5. | Extempore |
| 6. | Vocabulary building |
| 7. | E mail writing |
| 8. | Elocution |
| 9. | Debate |
| 10. | Power point presentation on given topic |
| 11. | Group Discussion |
| 12. | Mock interview |

**Submission –**
 **Completed Tutorial and assignment books**
**SCHEME OF ASSESSMENT:**

| TUTORIAL BOOK | 30 MARKS (Attendance, writing, performance) |
|---|---|
| ASSIGNMENT BOOK | 10 MARKS. |
| ORAL | 10 MARKS. |

**First Year B. Tech. Semester – II**
**DEMOCRACY, ELECTIONS AND GOOD GOVERNANCE**

| Evaluation Scheme* | |
|---|---|
| CIE | 50 |
| Total | 50 |

| Course Objectives | |
|---|---|
| 1. | By studying on their own, students will try to understand importance of democracy, election to local self-government bodies and good governance. |

| Course Outcomes | |
|---|---|
| At the end of the course students will be able to | |
| 1. | Answer questions related to democracy, election to local self-government bodies and good governance. |

| | Course Contents* |
|---|---|
| Unit 1. | Democracy in India<br>• Dimensions of Democracy: Social, Economic and Political<br>• Decentralisation: Grassroots Level Democracy<br>• Challenges before Democracy: women and marginalised sections of the society |
| Unit 2. | Election to Local Self Government Bodies<br>• 73rd and 74th Constitutional Amendment Acts: Institutions at the local level and Role of State Election commission<br>• Local Body Elections: Urban & Rural<br>• Duties of an Individual towards electoral process |
| Unit 3. | Good Governance<br>• Meaning and concept<br>• Government and Governance<br>• Good Governance initiatives in India |

**\* Students have to pass this subject by studying on their own & by securing minimum 20 marks out of 50, passing of this course is compulsory.**