

**IV Semester – Second Allied Course (SAC-III)**

***Textile Testing***

**Major Divisions:**

1. Moisture Relation
2. Testing of Fibers
3. Testing of Yarns
4. Testing of Fabric
5. Statistical Quality Control

**Unit – I**

**Moisture Relation and Identification of Fibers**

Humidity and its importance in textiles, Measurement of humidity by wet and dry bulb hygrometer and sling hygrometer. Moisture and its relations to textile materials. Idea on the terms Moisture content, Moisture regain and Standard regain. Values of standard regain for common Textile fibers. Factors affecting fibers regain. Effects of regain on fibre properties. Estimation of moisture content and regain by Conditioning oven

**Unit – II**

**Testing of Fibres**

Length – Importance of fibre length. Methods of measuring fibre length by Hand- stapling method, Baer sorter and Digital Fibrograph.

Fibre Fineness – Importance of fibre fineness. Methods of fineness measurement importance of Maturity. Relationship between Maturity and Fineness.

Fibre Strength – Importance of fibre strength. Measurement of strength by Stelometer.

Brief idea about Uster HVI – spectrum. Stress Strain curves for different fibres. Method of Nep counting on Card web.

Analysis of Trash content in raw cotton by Shirley Analyzer. Fibre Quality Index.

**Unit – III**

**Testing of Yarns**

Yarn count determination by knowle's Balance, Quadrant Balance. Importance to Twist. Estimation of twist by Twist contraction method and Doubled yarn twist by Take-up twist tester. Relationship between yarn count and twist.

Importance of yarn strength. Principles of constant Rate of Loading (CRL) and constant Rate of Extension (CRE).

Yarn Evenness – Random and periodic variations in yarn. Short term, Medium term and Long term variations.

#### **Unit – IV**

##### **Testing of Fabric**

Brief study on – Shirley Thickness Gauge, Determination of fabric weight per unit area, Count determination by Beesley's Balance. Cover factor and its importance.

Study on – Shirley stiffness Tester, Drape meter, Crease resistance and abrasion resistance. Importance to Tensile, Tearing and Bursting Strengths of fabric.

Brief study – Definitions of Fabric Air – Permeability and Fabric Air Resistance.

#### **Unit – V**

##### **Statistical Quality Control**

Classification and Tabulation of data. Types and construction of Frequency Diagram and its application. Measures of Dispersion – Mean Deviation, Standard Deviation, Co-efficient of Variation. Normal Distribution Frequency Curve and its importance in Textiles.

Calculation in Tests of Significance – t- Test for Mean, Quality control charts – Concept of quality and Meaning of Control. Construction of Control charts for Averages and Ranges. Interpretation of control Charts. Application of X – Bar Chart to Suit Textile Processes.

##### **Reference Books:**

1. Principles of Textile Testing., J.E Booth. 3<sup>rd</sup> Edition 1986, 4<sup>th</sup> Edition 1974, Butterworth Scientific, London
2. Hand Book of Textile Testing and Quality control., E.B Groover and D.S.Hamby., 1<sup>st</sup> U.S. Edition 1960. Wiley Eastern Ltd) New Delhi, India.
3. Hand Book of Methods of Test for Cotton Fibers, Yarns and Fabrics V.Sundaram and R.L.N. Iyengar 1968 Edition –CTRL, Mumbai.
4. The Characteristics of Raw Cotton –E.Loard,Vol II Part – I In the Series Manual of cotton spinning, 1961 Edition, The Textile institute and Butter worths, England.
5. ISI Hand book of Testile Testing .... SP, 15-1981. First Edition, 1982 Indian Standard Institution, New Delhi, India.
6. Methods of Test for Textiles –B.S Hand book No. 11, 1963 or B.S hand Book No.12,1974 – British Standards Intitution, London, England.
7. Statistical Methods, Gupta & Kapoor : S Chand & Co., New Delhi.
8. An Outline of statistical methods for use in the Textile Industry. A. Brearley & D.R. Cox, 8<sup>th</sup> Editions 1974, WIRA LEEDS, U.K