**Subject Code: 16SACAF3**

**DEPARTMENT OF APPAREL AND FAHION TECHNOLOGY**

**WET PROCESSING**

**Unit I**

**Textile Preparatory Process**

**Singeing**

* ‘singe’, means ‘to burn superficially’,
* Most common used woven or knitted fabrics
* Shiny and clean fabric surface.
* Reduction of pilling
* Three types- Plate singeing M/C, Roller singeing M/C, Gas Flame singeing M/C

**Desizing**

* Removal of sizing material
* Increase absorbency of fabric
* Increase to lustre
* The fabric uses dyeing and printing
* Increase affinity of fabric
* Methods of desizing- rot steep, acid and enzymatic

**Scouring**

* pre-treatment of the wet processing
* Remove natural impurities oil, wax, etc
* To clean the fabric by alkali, soap or detergent
* Types of Scouring- 1. Batch process/ Discontinuous process, 2. Continues Process

**Bleaching-**

* It removes the natural color from textile materials.
* It brings the textile materials permanent white
* Improve the absorbency of the textile materials
* Produce textile materials for the next process
* Some fabrics are sold as bleached goods

**Mercerization**

* Found by John Mercer in 1844 of England,
* Treated with cotton fibers with NaOH.
* Mercerization is applicable only cellulosic fibers
* The main purpose to alter the chemical and physical properties of fiber
* To improve strength
* To improve water absorbency

**Wool Carbonising**

* remove the vegetable matter from wool
* five main stages: scouring, acidizing, drying and baking, burr crushing and dedusting and neutralising

**Unit II**

**Dyes**

**Dyes**

* Dyes are coloured organic compounds
* Used to paper, leather, fur, hair, drugs, cosmetics, waxes, greases, plastics and textile materials.
* Colour
* Solubility in water
* Ability to be absorbed and retained by fibre (substantivity) or to be chemically combined with it (reactivity)
* Ability to withstand washing, dry cleaning and exposure to light.

**Natural Dyes**

* The majority of natural dyes are vegetable dyes from plant sources.
* E.g roots, berries, bark, leaves and wood.
* Eco-friendly
* Unique
* Varity of shades produced
* Used in cosmetics

**Synthetic Dyes**

* Today’s mostly used in synthetic dyes
* Cheaper to produce brighter,
* more colour-fast,
* easy to apply to fabric.

**Cationic (Basic) Dyes**

* It is water soluble, Using for silk, wool and tannin- mordanted cotton
* More important than fastness to light and washing
* Some basic dyes are used in medicine as antiseptics.

**Reactive Dyes**

* Extremely high wash fastness properties
* Chemical structure are much simpler
* E.g Azo, Triphendioxazine, formazan and anthraquinone
* High purity reactive dyes are used in the ink-jet printing
* Need alkali condition
* Light fastness and wash fastness are high

**Direct dyes**

* Anionic direct dyes are used for coloring papers
* Direct dyes are water soluble.
* It is anionic in nature.
* Generally applied for cellulosic as well as protein fibers.
* Fastness properties of improved by after treatment.
* It is used for cheap goods for local market.

**Azo dyes**

* The dyes containing azo group (-N=N)
* It is not ready-made dyes
* Two different components. i.e naphthol’s and bases
* Azo dyes are insoluble in water
* Excellent light fastness

**Acid Dyes**

* Acid dyes are highly water soluble
* Better light fastness than basic dyes.
* Acid dyes are effective for protein fibers
* Types of acid dye- Neutral acid dyes, Weak acid dyes, Strong acid dyes

**Disperse Dyes**

* one kind of organic substances
* It is insoluble or partial soluble in water
* It is used for dyeing synthetic textile materials
* Mainly used for dyeing polyester yarn of fabric.
* It is carried out in high temperature

**Sulphur Dye**

* Sulphur dyes are insoluble in water
* They are soluble in a solution of sodium sulphide (Na2S).
* Have poor fastness to chlorine
* Anionic dye
* Sulfur dye is used to dye cotton, cellulose, regenerated cellulose.
* Wash fastness excellent
* Rubbing fastness excellent

**Vat Dyes**

* Insoluble in water
* Can not be used directly for dyeing
* Can be converted to water soluble form
* Posses affinity to cellulosic fibers
* Involves two steps
* Salt formation by NaOH

**Pigments**

* “pigmentum” means coloring matter.
* Pigments are organic and inorganic materilas
* Pigments are used almost 30000 year ago.
* No direct affinity towards textile materials
* Binder is required for fixation.
* Rubbing fastness is poor

**Unit III**

**Fiber & Yarn dyeing**

**Fiber dyeing**

* The method of dyeing fibres before blending
* Two type- Stock dyeing, Top Dyeing

**Stock dyeing**

* Dyeing a stable fibre before it spun
* 500-3000 pounds of fibre are dyed at a time
* losses some of its flexibility
* Woollens- often stock dyed
* Resists rubbing- high color fastness

**Top Dyeing**

* It is another method of dyeing fiber or yarn prior to being spun.
* The short fibers are removed before the dyeing process

**Yarn Dyeing**

* Itis slightly differed from woven or knit dyeing

Package dyeing method

* Two types**-** A) Batch yarn Dyeing- Hank dyeing method

Beam yarn dyeing

B) Continuous yarn dyeing method Rope dyeing

Slasher dyeing

**Dyeing Defects**

* Materials having dead fibers or other defective fibers
* Material not properly desized
* Material not properly mercerized
* Absorbency of the fabric not proper
* Impurities are not removed for properly
* Uneven heat treatment

**Color fastness test**

* fastness to washing,
* immersion in water,
* perspiration,
* crocking,
* pressing,
* light and gas fading**.**

**Fastness to washing**

* The effect of laundering
* launder-ometer to evaluate color fastness to washing
* washing after the removal of dyes
* The grey scale for evaluating staining
* The effect of bleeding or color migration
* AATCC standard detergent 124 used.

**Colour fastness to light**

* The fabric to withstands the sun light
* The sunlight depends on
* The intensity of the light
* Inherent properties of the fabric
* Season
* Altitude
* Distance from the equator

**Colour fastness to Crocking**

* The rubbing off of colors is called as crocking
* Some time to increase the depth of the colors
* The crock meter used to find color fastness to crocking
* The test should be performed by wet and dry test
* The wet test moisture helps in removal of dyes.

**Color fastness to perspiration**

* It is chance color as well as staining of adjacent material
* The specimen is heated for 6 hours at 38 c
* With draw the fabric and remove any excess liquor
* 10 pounds of pressure
* Remove specimen and test cloth and compare with gray scale

**Colour fastness to Gas**

* Textile material is affected to various degree by atmospheric gases
* Inhibiters are used for this purpose but are not permanent
* Darker, brighter change more dramatically
* Blues turning pinkish, browns turning reddish

**Unit IV**

**Fabric & Garment dyeing**

**Fabric dyeing**

* Is the method after weaving, knitting, or non-woven to make fabrics
* Very popular method of dyeing

**Piece dyeing**

* Primarily used for fabrics that are to be a solid color
* A continuous length of dry cloth is passed full-width through of hot dye solution
* Removes the excess liquid

**Jigger Dyeing**

* One of the oldest dyeing machines used
* It is suitable for dyeing woven fabrics, up to boiling temperature without any crease
* A jig is very suitable for fabrics rope form
* The cloth involves the two main rollers dyeing is always involves an even number of ends
* The low liquor ratio makes washing-off difficult

**Beck Dyeing**-

* Its continuous process used to dye long pieces of fabric
* The fabric loaded open width in rope form
* Then passed through over a pony reel
* They used for wet process atmospheric dyeing of piece goods
* To start the dye bath at 120 degree’s

**Beam Dyeing**

* A wide range of knitted and woven textiles.
* The beam then subsequently inserted into a dyeing vessel
* The machine is closed and pressurized
* The fabric is placed under controlled tension
* The result elimination of creases on the fabric

**Jet Dyeing**

* Most modern machine used for dyeing of polyester using disperse dye
* It is similar to winch dyeing
* Fabric is processed in continuous loop
* Dyeing time is short and production to high
* Low consumption of water
* Fabrics are handled carefully and gently

**Foam Dyeing-**

* The main dyeing elements is foam
* If should be generate form radially
* It should be offering a good wetting capability
* Fast a uniform wetting action
* It should be little least effect by white materials
* producing various bubble sizes to meet specific requirements

**Solvent Dyes**

* It is continuous non aqueous phase
* Solvent is used as a dyeing media
* Non toxic
* Non-flammable
* Inert to textile material
* Low specific heat

**Garment Dyeing**

* Last process of the dyeing of goods
* It is used lingerie, socks, sweater dyeing etc

**Cross Dyeing**

* The method of obtaining a multi colr effect on a blend
* Two or more fiber types or fiber varients is purposely
* A different type of dye and becomes a different color
* The end product depends on the fiber arrangement in the fabric
* It may be check, a paid, a tweed, a strip, a muted, or some other design

**Unit V**

**Printing techniques**

**Printing**

* The applicable of colorant in definite, repeated patterns to fabric, yarn or sliver
* The are different methods are using
* Each method can be used to print one or more print types

**Screen printing**

* this method using a wooden and metal frame
* The screen is placed on top of the fabric
* The fine mesh and coat the fabric only in the areas of the design
* Quick pattern making
* 16 colors can be used on a design
* Sharp lines and features easily produced

**Stencil printing**

* It is a oldest way of printing
* The color applied to the fabric brushing are spraying.
* They used in plastic sheet, waterproof sheet or metal sheet
* A stencil prepares to manually
* Simple and cost effective
* Color combination is good in it

**Block printing**

* It is oldest and simplest way of printing
* The wooden block can be used
* The desired pattern was obtained by repeation the process using different colors
* Generally the wooden block is carved out of hand
* Printing is done by manually
* Simple method of printing
* No expensive equipment required

**Roller printing**-

* The design is put onto fabric by copper engraved rollers or cylinders
* Large quantities of the fabric at the rate 914-3658 m per hour can be printed
* Faulty joints or join marks a absent
* Fine sharp outlines and good prints

**Batik printing**

* Batik is derived from word AMBATIK
* Give a good artistic effect
* Cheap printing
* Fabric has a rich graceful appearance

**Tie-dye**

* A finished garment is twisted, knotted, gathered and then bound with elastic bands
* Produces a variety of patterns
* Garments made using tie & dye come in out of fashion  
  interested design created on fabric
* No machine cost is there