

(Textile Engineering Department)

Undergraduate

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Course Title: **Spinning Process**

Prerequisite: Fiber Science

Number of Credits: 2

Lecturer: Dr. Mohammad Etrati

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Course Topics:

- Introduction to spinning, raw material as a factor influencing spinning systems General principles of spinning, processing objectives, spinning methods
- Textile product numbering (direct & indirect systems) Yarn manufacturing calculations, roller and package surface speed, drum drive, belt drive, gears and pulleys with teeth, practice problems
- Attenuation (draft), roller drafting, calculation of draft, practice problems.
- Raw material (in short-staple spinning), material from bales (raw fibres), recycled fibres(from waste), quantity of waste in the spinning mills, practice problems Blowing, introduction, summary of the process, the components of blowroom machines
- . Blowing opening & cleaning drives, cleaning efficiency blending machines, dust removal, transport of material calculations (draft, production, blow per inch & lap measuring derives).
- Carding introductions, tasks of the card, operating regions of the card, card clothing, automatic flock feeding (chute feed), practice problems.
- Combing, introduction, tasks of the comber, combing preparation, combing cycle and comber mechanisms, technical data.
- Drawing process, purpose of drawing, main parts of the drawframe, technical data, and calculation of infeed material to drawframe.
- Reducing stage, introduction, description of functions, the operating regions of the roving frame, twist insertion, calculation of twist, practice problems.
- Spinning operation (the ring spinning), description of the ring spinning machine, twist insertion, calculation of twist, technical data, spinning limit, practice problems.
- Long-staple fibre spinning, introduction, general practice, spinning systems, processing objectives, raw material.
- Sequence of worsted, woolen and semi-worsted processed, worsted topmaking, worsted drawing & yarn manufacturing, worsted carding, intermediated gilling.
- Worsted combing, top finishing, recombining, worsted drawing, rubbing finisher and worsted spinning operation, spinning limit.
- Woolen spinning system, introduction, blending & oiling, woolen carding & condensing, woolen spinning operation.
- Semi-worsted spinning system, carding, gilling, spinning operation, spinning limit.
- Unconventional spinning, rotor spinning, friction spinning, air-jet spinning, solo, siro and compact spinning methods

Reading Resources:

- Werner Klein, “Manual of Textile Technology - The Technology of Short - staple Spinning”, The Textile Institute, Volume 1, 2014.
- Werner Klein, “Manual of Textile Technology - A Practical Guide to the Blowroom and Carding”, The Textile Institute, Vol.2, 2nd Ed., 2000.
- Klein W., “A Practical Guide to Ring Spinning”, The Textile Institute, Vol.4, 1987.
- Lord Peter R., “Handbook of yarn production-Technology, science and economics”, The Textile Institute, 2003.
- Klein W., “A Practical Guide to Combing and Drawing”, The Textile Institute, Vol.3, 1987.