



# YARN MANUFACTURE I : PRINCIPLE OF CARDING AND DRAWING

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**INTENDED AUDIENCE :** Undergraduate students of Textile Technology

### COURSE OUTLINE :

Carding and drawing are two fundamental process in yarn manufacture. In carding the fibre tufts are opened, cleaned and separated thoroughly by fast moving pinned surfaces and then reassembled to form a nice 2D array of fibres which is subsequently transformed into an uniform sliver. Drawframe is essentially a stretching device for sliver used to improve mass irregularity of sliver and parallelization of fibres.

### ABOUT INSTRUCTOR :

Prof. R Chattopadhyay , past Head of Department of Textile and Fibre engineering, IIT Delhi , has been teaching in the department for last 30 years. He has been publishing papers in national & international journals , presying papers in national and international conferences, reviewing papers, consulting industry . He is associated with Govt. organization , research institutes and academic institutions of the country. He has developed this course on Textile Product Design and Development for the senior UG and PG students of the department and offering the course for more than 10 years.

### COURSE PLAN :

**Week 1 :** Impurities in cotton, Opening and Cleaning principles, Layout of machines in blow room

**Week 2 :** Working principle and design features of opening , mixing and cleaning machines.

**Week 3 :** Tuft transportation, flow regulation

**Week 4 :** Lap formation, performance evaluation

**Week 5 :** Objectives of carding process, carding actions , working principle of carding machine, Card feed system, lap and continuous feed systems, design feature of taker-in/ licker-in,waste extraction, opening Intensity

**Week 6 :** Design feature of cylinder section, construction , design and working of flats, analysis of carding theory , carding force, fibre shedding, Transfer of fibres from cylinder to doffer,Technological significance of doffing arc, doffing of web , web condensation, Package formation: Forms of packaging, coiling, analysis of can drive

**Week 7 :** Motion transfer in card, draft and production calculations, card setting, significance of setting,

**Week 8 :** Card clothing: licker-in, cylinder ,doffer clothing; card tooth geometry, Operational load on cylinder , fibre transfer efficiency, carding process,

**Week 9 :** Autoleveller in card: principle of autolevelling, type of autoleveller, type of autoleveller, correction length, Fibre configuration in card sliver, mechanism of fibre hook and nep formation, cloudy web, Drawframe:Fundamentals of drafting, draft , ideal drafting, geometrical analysis of fibre movement in drafting

**Week 10 :** Objectives of drawing, Design features and working mechanism of drawframe. Drafting unit, drawing rollers, Drafting roller arrangement and its significance , package formation,Autoleveller in drawframe, Sliver irregularity and its control

**Week 11 :** Theory of drafting, Vasileffâ€™s model of drafting, drafting wave, Drafting force , draft vs drafting force, Roller setting: analysis of roller setting,influence of roller setting

**Week 12 :** Drawing process and its influence on fibre configuration in sliver, Draft and production calculation