SCIENCE AND TECHNOLOGY OF WEFT AND WARP KNITTING

PROF. BIPIN KUMAR  
Department of Textile Engineering  
IIT Delhi

TYPE OF COURSE : Rerun | Core | PG/UG  
COURSE DURATION : 12 weeks (20 Jul'20 - 9 Oct'20)  
EXAM DATE : 18 Oct 2020

PRE-REQUISITES : Textile Fibers, Yarn Technology

INTENDED AUDIENCE : Students and anyone working in Knitting industry.


COURSE OUTLINE : 
This course introduces the process of “weft and warp knitting” including its Science, Engineering, Technology and Design. The contents of the lectures have been systematically arranged to start from the basics of simple knit design, and then progressing towards Engineering of Advanced knitted structures and their Technologies.

ABOUT INSTRUCTOR :
Dr. Bipin Kumar is currently working as an Assistant Professor in The Department of Textile Technology at IIT Delhi. Prior to joining IIT Delhi, he worked as Research Assistant Professor (2016-2017) at The Hong Kong Polytechnic University, Hong Kong. He graduated from IIT Delhi, with a PhD in Textile Engineering in 2013. After PhD., he served as Postdoctoral Scholar at The Hong Kong Polytechnic University (2013-2014) and The University of California Davis (2014-2016). He is the first recipient from India to be selected for the Fulbright Postdoctoral Program (2013-14) in the field of textiles. His main research focuses on Textile Fabric Structures and Mechanics. He has over 30 publications in leading refereed SCI journals of materials, textiles and medical fields, 4 Patents, 2 Authored book, 10 book chapters, and over 30 conference proceedings. He holds editorial membership of several international refereed journals including AATCC Journal of Research, JEFF, FTEE and CTFTTE. For his outstanding contribution in research and teaching, he received several prestigious awards including IIT Delhi Teaching Excellence Award (2018), IEI Young Engineer Award (2018-19), ACP outstanding Material Scientist Award (2014), DST INSPRE Faculty Award (2016), and Award for Excellence in Postdoctoral Research (2016). Currently, he is involved in several start-up ventures in commercializing smart e-textile products for medical applications.

COURSE PLAN :

Week 1: Introduction to Knitting
Week 2: Flat and Circular Weft Knitting (Single Bed)
Week 3: Flat and Circular Weft Knitting (Double Bed)
Week 4: Basic and Advanced Weft Knit Construction – Part I
Week 5: Basic and Advanced Weft Knit Construction – Part II
Week 6: Geometrical Modeling of a Weft Knit Structure
Week 7: Process Control in Weft Knitting
Week 8: Introduction to Warp Knitting
Week 9: Swinging and Shogging Motion Control in Warp Knitting
Week 10: Basic Warp Knit Constructions
Week 11: Double Bed Warp Knitting
Week 12: Technical Applications of Knitting