

TEng3221: Yarn Properties Testing

Department of Textile Engineering Wollo University				
Course number	TEng3221			
Course title	Yarn Properties Testing			
Degree program	B.Sc. in Textile Engineering			
Module	22: Textile Testing			
Module coordinator				
Lecturer				
ECTS Credits	3			
Contact Hours (per week)	Lecture	Tutorial	Laboratory or Practice	Home study
	2	0	2	2
Course Objectives & Competences to be Acquired	The aim of the course is to enable students to: • Know general quality aspects of fibres and yarns; Know sampling techniques of fibres and yarns; Understand the properties of fibres, intermediate products and yarns • Understand the ways to checking of quality of intermediate products and yarn • Know the working principle of testing instruments and working on them • Understand the method of test analysis and interpretation of the results			
Course Description/ Course Contents	Introduction to Textile Testing: • Objectives of testing; Selection of samples for testing; Sampling Techniques • Sampling methods for yarns Atmospheric conditions for testing: • Moisture regain and content of textile fibers; Moisture testing and drying ovens			

	• Electrical and capacitance methods for measuring moisture Fiber Length, Fineness and Maturity Testing: • Different methods of fibre length measurements; Fibre length measuring instruments • Different methods of fibre fineness measurements; Fibre fineness measuring instruments • Limitations of the instruments and interpretation of the results obtained from the fineness instruments • Maturity testing; Caustic soda method of maturity test; Differential dyeing • Polarized light method of maturity test Trash Testing • Shirley trash analyzer Yarn count Testing • Direct and Indirect systems of count testing; Conversion factors; Length Measurement; • Mass measurement; Doubled yarns; Yarn count and diameter Twist and twist measurement • Measurement of twist; Straightened fiber method; Continuous twist tester; Twist contraction method; • Twist to break method; Twist measurement by microscope; Take-up twist tester Tensile testing: • Factors affecting tensile properties; Principles employed in tensile testing of fibers and yarns • C.R.L. and C.R.E. principles; Pendulum Lever, Inclined plane, and Strain-gauge principles • Fiber strength testing; Yarn strength testing Yarn Evenness Testing:
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	• Nature of irregularity; Short-term, Medium-term and Long term variation • Methods of measuring irregularity; Limit irregularity; Index of irregularity • Electronic capacitance testers; Uster Evenness tester Principles and features • Results of evenness testers; Uster yarn standards; Spectrogram analysis; Imperfections • Zweigle G 580 evenness tester: Principles and features; Classimat system • Yarn Hairiness Testing; Zweigle Hairiness tester- Principles; features • Yarn appearance: ASTM Boards Quality Control in Spinning: • Considerations in ensuring cotton quality; Cleaning efficiency of blow room and carding machines • Evenness properties of card sliver, draw frame sliver, roving and yarns • Nep analysis of card sliver; End breakage analysis at speed frames and ring frames • Ring frame idle spindle %; Yarn count and count variation; Yarn grade and appearance
Pre-requisites	Teng 3143 Yarn Manufacturing II & Teng 3153 Woven Fabric Manufacturing II
Semester	6 th Semester (Year 3, 2 nd semester)
Status of Course	Compulsory
Teaching & Learning Methods	Lectures and Laboratory/Practical exercises supported by assignments
Assessment/ Evaluation	The Lecture and Lab/Practical parts of the course will each be evaluated separately for 100 % and the final marks will be

&Grading System	arrived at by giving weights according to the hours allocated to the Lecture and Lab/Practical parts. The details are given below : <u>Lecture Part (Weight 40%)Lab/Practical Part (Weight 60%)</u> Mid-Term Examination: 40 % Lab/Practical Records: 30 % Final Examination: 60 % Lab/Practical Written Examination: 40 % Total 100 % Demonstration/ Defence: 30 % Total 100%
Attendance Requirements	• A minimum of 85 % attendance during lecture sessions • 100% attendance during lab/practical class sessions
Literature	1. Booth, J.E., Principles of Textile Testing, NewnesButterworths, London, 1979 2. Saville, B.P., Physical Testing of Textiles , The Textile Institute, 1998 3. Bona M, ‘Textile Quality: Physical methods of product and process control’, Eurotex, Italy, 1994 4. Bona M, ‘Statistical Methods for Textile Industry’, Eurotex, Italy, 1993 5. Wilson, D.K., Monitoring and Testing of Manufactured Fibres (Textile Progress Vol. 28 No.2), The Textile Institute, UK 6. Leaf G, Practical Statistics for Textile Industry: Part II and I, The Textile Institute Manchester, 1984 7. Barella, A., Yarn Hairiness (Textile Progress Vol. 13 No. 14), The Textile Institute, UK, 1983 8. Slater, K., Yarn Evenness (Textile Progress Vol. 14 No. 3/4), The Textile Institute, UK, 1986 9. Manich, A.M. and Barella, A., Yarn Hairiness Update (Textile Progress Vol. 26 No. 4),), The Textile Institute, UK, 1997