

(Textile Engineering Department)

Undergraduate

Course Title: Physical & Mechanical Properties of Technical Textiles

Prerequisite:

Number of Credits: 2

Lecturer: Dr. Ali Akbar Merati

Course Topics:

- Introduction to the Physical and Mechanical Properties of Technical Textiles (Importance, Classification and Applications)
 - Dimensional and Apparent Properties of Technical Textiles
 - Wettability Properties of Technical Textiles
 - Permeability Properties of Technical Textiles
 - Thermal Properties of Technical Textiles
 - Electrical Properties of Technical Textiles
 - Acoustic Properties of Technical Textiles
 - Tensile Properties of Technical Textiles
 - Tensile properties of single-component technical textiles
 - Tensile Properties of Multi-component Technical Textiles
 - Bending Properties of Textiles (Flexibility)
 - Shear Properties of Technical Textiles
 - Physical and mechanical properties for constructional textiles and their measurement
 - Physical and Mechanical Properties for Protective Textiles and their Measurement
 - Physical and Mechanical Properties for Medical and Intelligent Textiles and their Measurement
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Reading Resources:

- Jinlian HU, Make: Fabric testing, Woodhead Publishing Limited, 2008.
- Jarmila Svedova, "Industrial Textiles", Textile Science and Technology, North Holland January 29, 1991.
- Horrocks A R and Anand S C, HANDBOOK OF TECHNICAL TEXTILES, Woodhead Publishing Limited 2000.
- Rajiv Padhye, Rajkishore Nayak, Acoustic Textiles, Springer, 2016.
- Morton W. E. and Hearle J. W. S., Physical properties of textile fibres (Fourth edition), Woodhead Publishing, 2008.
- Bunsell A. R., Handbook of tensile properties of textile and technical fibres, Woodhead Publishing Limited, 2008.
- Bipin Kumar, Textiles for Advanced Applications, InTech Publisher, 2017.
- Boris Mahltig, Textiles: Advances in Research and Applications, Nova Science Publishers, 2017.
- Advances in Yarn Spinning Technology, Chapter 11: Friction spinning, Authors: Ali Akbar Merati. Edited by C. A. Lawrence, Publisher: Woodhead Publishing Limited, 2010, ISBN 978-1-84569-444-9.

- Soft Computing in Textile Engineering: Yarns, Fabrics, Garments and Technical Textile Applications, Chapter 18: Textile quality evaluation by image processing and soft computing techniques, Authors: Ali Akbar Merati and Dariush Semnani, Edited by Abhijit Majumdar, Publisher: Woodhead Publishing Limited, 2011, ISBN 978-1-84569-663-4.
- Yarn Formation in Friction Spinning, Author: Ali Akbar Merati, Publisher: LAMBERT Academic Publishing, 2013, ISBN 978-3-659-39214-6.
- Textiles: History, Properties & Performance and Applications: Chapter 8: Smart Textiles, Authors: Ali Akbar Merati. Edited by Professor Md. Ibrahim H. Mondal, Publisher: Nova Science Publishers NOVA Publishing Limited, 2013, ISBN 978-1-63117-262-5.
- Cellulose and Cellulose Derivatives: Chapter 8: Electrospinning of Cellulose and Cellulose Derivatives, Authors: Ali Akbar Merati and Najmeh Moazeni. Edited by Professor Md. Ibrahim H. Mondal, Publisher: Nova Science Publishers NOVA Publishing Limited, 2016, ISBN 978-1-63483-885-6.
- Textiles: Advances in Research and Applications: Chapter 1. Advances in Research and Applications of Smart Textiles, Author: Ali Akbar Merati. Edited by Professor Boris Mahltig, Publisher: Nova Science Publishers NOVA Publishing Limited, 2017, ISBN 978-1-53612-855-0.
- Chapman R. A., Applications of Nonwovens in Technical Textiles, Woodhead Publishing Limited, 2011.
- Bipin Kumar and Suman Thakur, Textiles for Advanced Applications, InTech Publisher, 2017.
- Long, A. C., Design and manufacture of textile composites, Woodhead Publishing Limited, 2005.
- Hu J., Fabric testing, Woodhead Publishing Limited, 2005.
- Brian N. Cox and Gerry Flanagan, Handbook of Analytical Methods for Textile Composites, NASA Contractor Report 4750, 1997.
- Kate Hartman, Make: Wearable Electronics, Maker Media, Inc., 2014.
- Eugene Wilusz, Military textiles, Woodhead Publishing Limited, 2008.
- Morton W. E. and Hearle J. W. S., Physical properties of textile fibres Fourth edition, Woodhead Publishing Limited, 2008.
- Xiaoming Tao, Smart fibres, fabrics and clothing, Woodhead Publishing Limited, 2008.