

(Textile Engineering Department)

Undergraduate

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**Course Title: Mechanical properties of textile materials in clothing**

**Prerequisite:** Strength of Materials (I), Fiber Physics

**Number of Credits: 2**

**Lecturer: Dr. Maryam Yousefzade**

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**Course Topics:**

- Introduction to textile materials in clothing and importance of their mechanical properties in clothing manufacturing and wear
  - **Fibers: General concepts in mechanical properties of fibers, tensile properties**
  - **Fibers: shear stresses, torsion and bending properties**
  - **Fibers: compression, buckling and fatigue properties, mechanical & thermal failure**
  - **Yarn: Effect of physical structure and twist on the mechanical properties**
  - **Yarn: tensile stresses and bending properties, blend yarns**
  - **Yarn: sewing threads**
  - **Fabric: structural mechanics, investigation of structural parameters**
  - **Fabric: interaction of mechanical properties of textile materials on fabric properties**
  - **Fabric: tensile and bending properties**
  - **Fabric: shear, compression and surface properties**
  - **Fabric: drape, pilling**
  - **Fabric: bagging, tearing**
  - **The effect of sewing parameters on the mechanical properties of cloth**
  - **Conclusion and problem solving**
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**Reading Resources:**

- Miao M and Xin J.H. (Ed.), "Engineering of High-Performance Textiles", Woodhead Publishing Ltd., Cambridge, 2018
- Behera B.K., Hari P. K., "Woven textile structure, Theory and applications", Woodhead Publishing Ltd., Cambridge, 2010
- Hu J., "Structure and Mechanics of Woven Fabrics", Woodhead Publishing Ltd., Cambridge, 2004
- Hearle J.W.S., Grosberg P. and Backer S., "Structural Mechanics of Fibers Yarns and fabrics", John Wiley & Sons Inc, New York, 1969
- Uploaded files in course webpage: Mechanical properties of textile materials in clothing course