

(Textile Engineering Department)

Graduate

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Course Title: **Structural Theories of Fabrics**

Lecturer: **Dr. Ali Asghar Asgharian Jeddi**

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**Course Topics:**

- Pierce) Peirce's circular cross-section geometry of plain-weave fabrics)
- Kemp's racetrack cross-section geometry of plain-weave fabrics Hearle's lenticular cross-section geometry of plain-weave fabrics
- Bow shaped geometry of plain-weave fabrics -- Cover factor of fabrics
- Geometrical and mechanical model of fabrics based on yarn path
- Structure of fabric under biaxial tension
- Introduction of mechanical behavior of textiles
- Energy method; Castigliano's Theorem
- Initial modulus of plain woven fabrics
- Dimensional properties and stability of weft knitted fabrics
- Doyle ) - - Theoretical loop models (Chamberlain, Peirce, ...) - Experimental loop models
- Buckling of elastic rod
- Munden's loop model (Theoretical and experimental
- (Ideal loop model for plain knitted fabric (two dimensional and three dimensional) Ideal loop models for rib and interlock
- Weft knitted fabrics with complex structure. - - Mathematical analysis of effective parameters on the fabric shrinkage. - - The relationship between fabric surface parameter (Ks) and fiber density. -.y. -.
- The geometry of plain knitted fabric under bi-axial stress.
- Theoretical models of warp knitted fabrics (Alison, Grosberg, Raz, and straight line models). -- The relationships between fabrics bending and their structural parameters.

**Reading Resources:**

- Journals paper