

(Textile Engineering Department)

Undergraduate

Course Title: Industrial Textiles and Applications

Prerequisite:

Number of Credits: 3

Lecturer: Dr. Azita Asayesh

Course Topics:

- technical textiles definition, history of technical textiles, technical textiles trade, classification of technical textiles
 - fibers and yarns used in technical textiles
 - fabrics used in technical textiles- production method of multiaxial fabrics, properties and applications
 - Types of 3d fabrics- production methods and properties
 - Types of 3d fabrics- production methods and properties(continue)
 - spacer fabrics production methods- properties and applications
 - Automotive textiles-air bag, production process and requirements, seat belts, production process and requirements
 - Types of tire- requirements of tire cord fabric and manufacturing process - Effect of twist level on tire cord performance seat cover, different layers and requirements- structure of automotive carpet and requirements
 - Geosynthetics- geotextiles, materials and manufacturing, applications of geotextiles
 - physical and mechanical properties of geotextiles - hydraulic properties of geotextiles
 - Filtration terms- filtration mechanism types of filters- effect of fabric structural parameters on the function of woven filters
 - Nonwoven filter media- effect of fabric structural parameters on the performance of nonwoven filters filter requirements- finishing treatments
 - Fibers used in medical textiles and their characteristics- classification of medical textiles textiles for implantation, structure and requirements
 - non-implantable textiles, structure and requirements, textiles for extra corporeal devices, health care and hygiene products, structure and requirements
 - Ballistic protective textiles, requirements, fibers and fabric structure, effect of fabric structural parameters on the absorbed energy, Firefighters protective clothing, requirements, material and structure of different layers
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Reading Resources:

- Wellington sears handbook of industrial textiles, SabitAdanur, Technomic Pub.
- Handbook of technical textiles, A. R. Horrocks, S. Anand, Woodhead Pub.
- Textiles for Industrial Applications, R. Senthil Kumar, Taylor & Francis, 2013.
- High-performance Fibres, J W S Hearle, Woodhead Publishing, 2001.
- 5. Technical textile yarns, R. Alagirusamy and A. Das, Woodhead Publishing in Textiles, 2010.
- Advances in 3D Textiles, Xiaogang Chen, Woodhead Publishing in Textiles, 2015.
- Medical Textile Materials, Yimin Qin, Woodhead Publishing Series in Textiles, 2016.
- Handbook of medical textiles, V. T. Bartels, Axfordwoodhead pub.

- Textile advances in the automotive industry, R. Shishoo, Woodhead Publishing in Textiles, 2008.
- Handbook of Non-Woven Filter Media, Irwin Hutten Elsevier Science & Technology, 2007.
- Geosynthetics and their applications, Sanjay Kumar Shukla, Thomas Telford, 2002.
- Textiles for protection, Richard A. Scott, Woodhead Publishing in Textiles, 2005.