

(Textile Engineering Department)

Graduate

---

**Course Title: Technology & Production Methods of Nano-Fibrous Structures**

**Lecturer: Dr. Maryam Yousefzade**

---

**Course Topics:**

- Introduction to nanotechnology & nanomaterials, why go small
- Why nanofibers? History, Applications and future perspective. Methods of nanofiber production
- Electrospinning (Solution, Melt, Gel), Principles & stages of jet formation and inter-system forces investigation
- Modeling and simulation of the electrospinning process
- Polymers & polymer solutions
- Electrospinning parameters and their effects on the nanofibers morphology: Polymer solution
- Electrospinning parameters and their effects on the nanofibers morphology: process parameters
- Modeling performance of electrospun nanofibers & nanofibrous assemblies
- Electrospinning parameters and their effects on the nanofibers morphology: Environment
- Electrospray, Micro-capsulation
- Case study
- Theories, fabrications and applications of nanofibrous yarns and nanofiber coating
- Nanofibrous composites, functionalization and dispersion of nanomaterials
- Bicomponent, hybrid and poly blend nanofibers
- High throughput nanofibers fabrication (centrifuge, melt, island-in-sea, 3D print, ...)

**Reading Resources:**

- Handbook of Nanofibers, Springer, 2019
- Electrospun nanofibers, WP, 2017
- Science and technology of polymer nanofibers, Wiley, 2008
- Uploaded files in course webpage: Technology & Production Methods of Nano-Fibrous Structures