(Textile Engineering Department)

Undergraduate

Course Title: Composites
Prerequisite:
Number of Credits: 3
Lecturer: Dr. Hajir Bahrami

Course Topics:

- **An introduction to composite materials, classification different matrices and reinforcement**

- **Polymer matrix and different matrices. An introduction to polymers physical and mechanical properties thermal properties and glass transition temperature.**
- **Synthesis of polymers, Radical chain polymerization reactions and kinetics**
- **Ionic (cat ionic and anionic polymerization Coordination polymerization reactions and kinetics.**
- **Step polymerization**
- **Thermoplastic resins such as PP, PE, PVC, PA, PET ETC. and their properties**
- **Thermoset resins such as Epoxy resins, unsaturated polyester resins, Acrylic polyurethane and Alkyd resins etc.**
- **Curing process and curing agents hot and cold curing multi and single step curing process.**
- **Additives used polymer composite such as fillers, antioxidants stabilizers different powders used in composite materials**
- **Different high performance fibers such as carbon, glass, Aramide etc., their production and properties**
- **Composite manufacturing processes for thermoplastic resins. Injection moldings Extrusion.**
- **Open mold and closed molds processes coatings and preperge**
- **Hand layup technique airbag technique autoclave pultrusion**
- **Interface and its roll in composite materials**
- **Manufacturing and designing composite materials and affecting parameters.**

Reading Resources:

- Fiber Science and Technology.
- Composite polymeric materials
- Had book of polymer Fiber composites.
- Fiber reinforced composites