

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: III

Plastic Engineering

Subject Name: **BIOMEDICAL PLASTICS (MAJOR ELECTIVE-IV)**

Sr.No	Course content
1.	Recent Development in the Bio-Polymer Industry: Fibre –Reinforced composites starch based materials, Plant Produced Polymers, Microbially produced polymers, Biologically-Based resins, Adhesives, and coatings, continuing research and development on Bio-polymers
2.	Synthetic and Natural Biomaterials Used in Biomedical applications : i) Polyolefin's, Polyamides, Acrylic Polymers, Fluorocarbons, Polyesters, Engineering Plastics. ii) Collagen, Polysaccharides, Proteins, etc.
3.	Human Applications of Plastics: Cardiovascular implants, Dental Implants, Role of plastics in Ophthalmology, Hydro gels, Drug Delivery systems, Sutures, Burn Dressings and Artificial skin, Hernia Mesh, Adhesives and Sealants, Artificial organs and devices, Blood bags, Condoms, etc
4.	Blood Polymer interactions and blood compatibility, chemical and biochemical degradation of polymers, Tissue engineering and polymers..
5.	Testing and Evaluation: in-vitro/vivo; Standards in product development and regulations; Ethical and sociological issues.

Reference Books:

1. Buddy D. Ratner, Allan S. Hoffman, Fredrick, J. Schoen and Jack E. Lemons (Eds), Biomaterials, Science – An Introduction to Materials in Medicine, Academic Press, San Diego (1996).
2. Joon B. Park and Roderic S. Lakes, Biomaterials: An Introduction, 2nd edition, Plenum Press, New York (1992).