

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: II

Plastic Engineering

Subject Name: **COMPOSITES MATERIAL TECHNOLOGY(Major Elective-II)**

Sr.No	Course content
1.	Introduction : Resins for composites – polyester resins – epoxy resin – phenolic resins – vinyl ester resins – alkyd resins.
2.	Reinforcements for Composites : Natural fibers – jute, sisal – synthetic fibers – glass fibers – types and different forms – carbon fibers – classification - graphite fibers – polyethylene fibers – silicon carbide and boron fibers.
3.	Additives for composites : catalysts – room temperature and elevated temperature – accelerators – coupling agents – fillers – flame retardants – toughening agents – UV stabilizers
4.	Processing of Composites: Important processes like hand lay-up, spray-up, resin transfer moulding, vacuum bag, pressure bag moulding, centrifugal casting, pultrusion, filament winding, moulding compounds – SMC, DMC, BMC, TMC.
5.	Testing Quality Control & End Use of Plastics: Testing for mechanical, electrical, thermal, optical and chemical properties, Determination of shelf life and gel time – Non-destructive testing methods. Application of FRP products - in marine, chemical, railways, electrical and electronic industry, space structures – Robotics.

Reference Books:

1. P.K. Mallic, Fiber Reinforced composites, Morcal Dekker Inc. 1988.
2. Sidney H. Goodman, Handbook of Thermoset Plastics, John Wiley & Sons, 1984.
3. T.G. Gutowski, Advanced Composites Manufacturing, John Wiley & Sons, 1997.
4. S.M. Lee, Reference Book for Composite Technology I, II & III, Technomic Publishing Co., 1989.