

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. SEMESTER : VIII

RUBBER TECHNOLOGY

Subject Name: **RUBBER PROCESS & PRODUCT COMPUTER AIDED DESIGN**

Sr. No.	Course Contents	Total Hrs
1.	Introduction to CAD- Design, optimization and simulation.	4
2.	Optimization: Objectives, methods of optimization- graphical method, linear programming-simplex method, dual simplex. Modeling, fitting models to data, Least square method.	12
3.	Algorithms for interpolation, extrapolation, curve fitting of polynomials, numerical differentiation & integration, solution of engineering/technological/design problems relating to polymer/monomer synthesis, polymeric reactions, polymer & Rubber processing, Rubber & polymer products etc. Newton's method, secant method.	8
4.	Genetic Algorithm: Introduction, concept, theory, history, methods and applications specifically to Rubber extruder design.	10
5.	Finite Element Analysis: Introduction, history, general description of the method, advantages and disadvantages of FEA. Application of FEA in Rubber products and process design.	6
6.	Artificial Neural Network: Introduction, Concept, methods and its application in rubber technology especially to rubber properties prediction.	6
7.	Software for Data Acquisition & Analysis : Applications of Data Acquisition in a Rubber Factory, Device Drivers, Menu-Driven Software, "Virtual Instrument" Software, Turn-Key Software, Data Reduction Software, Errors in Data Acquisition & Analysis, Evaluating Test Instrumentation, Networking Microcomputers, Applications of LANs to Rubber Factories, Attaching a LAN to Laboratory Information Management System(LIMS), Incorporating Microcomputers into a Laboratory.	8

Practical and Term Work:

It should be based on theories

Textbooks:

- Rubber Products Manufacturing Technology By : Anil K. Bhowmick
- Numerical Methods in Science and Engineering By : Dr. B. S. Grewal

Reference Books:

- Industrial Instrumentation By: Donald Eckman
- Automatic Process Control By: Donald Eckman