2.7 30319 CHEMICAL REACTION ENGINEERING

UNIT-1 INTRODUCTION:
Chemical kinetics, classification of reactions variables Affecting the rate of reaction.

UNIT-2 HOMOGENEOUS REACTIONS:
Concentration dependent term of a rate equation, single and multiple reactions, series and parallel reactions. Elementary and Non-elementary reactions, Kinetic view for Elementary reactions molecularity and order of reaction, Rate constant K. Representation of a reaction rate, Temperature dependant term of a rate equation, Temperature dependency from - (Arrhenius law, Thermodynamics and collision Theory).Activation energy and Temperature dependency. Simple numerical problems.

UNIT-3 INTERPRETATION OF CONSTANT VOLUME BATCH REACTOR DATA:
Constant volume batch reactor-Integral method of Analysis of data, Differential method of analysis of data temperature and Reaction rate. The search for a rate equation. Simple Numerical problems.

UNIT-4 IDEAL REACTORS:
Classification of reactors and application & their comparison, Ideal batch reactor, space time and space velocity, steady-state mixed flow reactor, steady state plug flow reactor. Holding time and space time for flow systems. Simple numerical problems.

UNIT-5 INTRODUCTION TO HETROGENEOUS REACTING SYSTEMS:
Rate Equation for Heterogeneous Reactions. Contacting pattern for two phase system Simple Numerical problems.

UNIT-6 INTRODUCTION OF VARIOUS TYPES OF INDUSTRIAL REACTORS:
CSTR, Trickle, She ray, packed bed, Fluidizer bed.

Reference Books:
1. Chemical Engineering Kinetics by J. M. Smith
2. Chemical Reaction Engineering by Octave Levenspal
3. Reaction Engineering by Walas
4. Chemical Reaction Engineering I & II by K. A. Gawhane