

SARDAR PATEL UNIVERSITY
Programme & Subject: M.Sc (Industrial Chemistry)
Semester: III
Syllabus with Effect from: June-2012

Paper Code: PS03CICH07	Total Credit: 4
Title Of Paper: Chemical Reaction Engineering & Utility Engineering	

Unit	Description in Detail	Weightage (%)
I	Kinetics of Homogeneous reactions: Single and Multiple Reactions, Elementary and Non-elementary reactions, Molecularity and order of reactions, Kinetic models for non-elementary reactions, Temperature dependency and reaction rate prediction from Arrhenius, transition and collision theories.Integral and Differential analysis for constant volume and variable volume reactors-irreversible & reversible.	25%
II	Design of reactors: Design of Ideal batch, CSTR and plug flow reactors, determination of the best system for a given conversion, residence time distribution- determination of exit age curve.	25%
III	Kinetics of Heterogeneous reactions: Global rate of reaction, Effect of transport processes on selectivity in series and parallel reactions, Rate equations for surface reactions, Three phase reactors – Slurry and Trickle bed reactors. Determination of surface area , porosity, density and particle size of catalyst	25%
IV	Steam & Steam generation: Introduction and thermodynamics of steam generation, steam generators, Indian boiler act, Oil heating (furnace oil).calculations for boilers	25%

Basic Text & Reference Books:-

- Chemical Reaction Engineering, Octave Levenspiel, Wiley Eastern Ltd. 3rd edition.
- Chemical Engineering Kinetics, J.M.Smith, Mc.Graw Hill Book Co.3rd edition.
- Chemical Kinetics, S. K. Jain, Vishal Publication, Jallander.
- Fundamentals of Chemical reaction Engineering., Holland & Anthony
- Chemical Reactor Theory, Lenbigh & Turner, University of Cambridge.
- Reaction Engg. Through solved problems, G.M.Pande & S.M. Shrivastava
- Chemical Engg. Handbook, Robert Perry. 7th edition.
- A text book of plant utilities, D. B. Dhone,Nirali Prakasan 6th edition

