VEER NARMAD SOUTH GUJARAT UNIVERSITY

B. E. III (TEXTILE PROCESSING) Semester - VI

TP - 604, CHEMICAL ENGINEERING & REACTION KINETICS

Teaching Scheme (No. Of Contact hr.)			Theory Exam		Practical/Quiz/Viva Exam		Grand Total
			Duration (hr.)	Marks	Sem. End Exam	Cont. Int. Evaluation	
Theory	Tut.	Pract.					
3	1	-	3	100	-	-	100

Theory

1. **Chemical Engineering :**
   Fluid mechanics, Fluid statics, Bernoulli Theorem, Continuity equation and momentum equation, Friction in pipes, Pressure losses. The measurement of velocities using the orifice plate, the venturi meter, variable-area meters, weirs, notches. Methods of measurements of viscosity. Introduction to Stoke's Law.
   Dimensional analysis. Reynolds number, laminar and turbulent flow, Poiseuille's equation, friction factors and simple pressure drop calculation. Pumps, design and selection of pipe work and pumping systems for a chemical plant.
   The analogies between momentum heat and mass transfer. The flow of fluid through beds of solids. The pressure drop over packed bed and theory of filtration at constant flow or constant pressure.
2. Reaction kinetics, extension of the Collision Theory and transmission state theory of absolute reaction rates. Concept of Entropy of activation. Chain reactions : consecutive and concurrent reaction : unstable intermediates (thermal, photochemical and radiation induced reactors).
   Homogeneous Catalysis : Heterogeneous reactions and catalysis. The study of fast reactions by current techniques. Application of thermodynamic and reaction kinetics to industrial processes : batch and continuous reactors.
3. Phase Equilibrium. Conditions for equilibrium between phases two component systems : generalised treatment of miscible, partially miscible and immiscible systems (both liquid vapour and liquid/solid equilibria). Processes involving phase separation : distillation, zone refining, liquid-liquid extraction. Three component system of two salts and water : crystallization problems.

References :-

01.	Chemical Reaction Kinetics	Octave & Levenspiel
02.	Introduction To Chemical Engineering	Chatto Padhyay
03.	Unit Operation To Chemical Engineering	McCabe & Smith
04.	Chemical Engineer Vol. I, II, III	J. M. Coulson, J. F. Richarleson
05.	Introduction in Chemical Engineering	Badger and Banchero
06.	Stoichiometry	B. I. Bhatt, S. M. Vora