GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Chemical Engineering

Semester: I

Subject Name: **Advance Fluid Flow Operation**

Sr.No	Course content
1.	**Rheology of Non-Newtonian Fluid:** Models for the Non-Newtonian Fluid like power law fluid Visco-Elastic fluid, Bingham plastics fluid etc., Viscosity measurement techniques , various viscometer used to predict the flow behavior like plate & cone viscometer, Bob and cup Viscometer etc., Polymer Rheology
2.	**Mixing Techniques:** Immiscible mixing ,Gas liquid mixing, liquid solid mixing , solid-solid mixing etc., Mixing mechanism , Laminar, Turbulence, Power consumption, in Stirred vessels, Rate and time mixing, Mixing Equipments, Batch and Continuous system.
3.	**Performance Characteristics of Fluid Moving Machineries:** Pumps, Blowers, Compressors
4.	**Fluidization Engineering:** Liquid-Solid system, gas-solid system, designing of fluidized bed system (with emphasis on reactors.) for single solids and mixed solids.
5.	**Flow Through Jet:** Characterisitcs, Application of jet in moving machineries, Application of jet in vacuum system.
6.	**Two Phase Flow Prediction :** Various flow patterns in Horizontal and vertical pipes, Different Models for two phase fluid flow patterns
7.	Cfd and Its Application in Chemical Engineering
8.	Recent Application in Advance Fluid Flow Operation

Reference Books:

1. Transport Phenomena by R.H.Bird, W.E.Stewart
2. Chemical Engineering Vol I, Richardson & coulson
3. Chemical Engineering Handbook 6^{th} edition by R.H.Perry & Green D.