CHEMICAL REACTION ENGINEERING-II

Course Code: 15CH1127

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Course Outcomes :

At the end of the Course, the Student will be able to:

CO 1 State the importance of RTD and describe the compartmental models for modeling of Non-ideal flow reacting vessels.

CO 2 Calculate the conversions based on segregated flow model, dispersion mode and tanks-in-series models.

CO 3 Synthesize a rate law given the rate controlling step in catalytic reactions, internal and external diffusion effects.

CO 4 State factors influencing catalyst decay, the role of pore diffusion on catalyst activity rate.

CO 5 Explain shrinking core model for spherical particles of unchanging size and design the fluid-solid reactors.

UNIT-I (10 Lectures)

The importance of Residence Time Distribution studies. The concept of E and F curves. Diagnosing Reactor ills like stagnant zones and bypassing in a vessels (Qualitative only). Compartment Models for modeling of Non-Ideal Flow Reacting vessels. Problems on calculating volumes and bypassing flow rates in a CSTR and PFR and their combination given the F curve or E curve.

UNIT-II (10 Lectures)

Dispersion Model and Tanks in series model for modeling Non-Ideal reacting vessels problems to calculate Number of tanks in series and Dispersion number based on these models. Problems on calculating conversion based on dispersion Model, Tanks in series and Segregated

REFERENCES:

1. Fogler. H.S., "Elements of Chemical Reaction Engineering", 3rd Edition, Wiley, 1999.
2. Smith. J.M., "Chemical Engineering Kinetics", 3rd Edition, McGraw Hill, 1981.