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| 5 <sup>th</sup> Semester | RCH5D004 | FLUIDIZATION ENGINEERING | L-T-P<br>3-0-0 | 3 CREDITS |
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**Module I: (12 hr)**

Introduction to fluidization, types of fluidization, gross behaviour of fluidized beds, minimum fluidization velocity, pressure drops in fluidized beds, bed voidage, TDH, viscosity and fluidity of beds, bubble behaviour, bed expansion, distributor design.

**Module II: (18 hr)**

Simple mathematical treatment, Solid transport: flow and fluidized solids, solids transfer, terminal velocity, particle entrainment and elutriation, simple calculations.

**Module III: (10 hr)**

Heat and mass transfer in fluidized beds: Heat transfer mechanism, principles of gas-solid and bed surface transfer, heat transfer to liquid fluidized systems, generalized correlation for fluidized bed mass transfer and its limitations.

**Module IV: (8 hr)**

Semi-fluidization: principles, production of various bed parameters, Industrial applications; Design of fluidized bed reactors: Concept of RTD, basic design principles for fluidized bed.

**Books:**

1. Fluidization Engineering, 2nd ed. by D Kunii and O Levenspiel, Butterworth-Heinemann.
2. Handbook of Fluidization and Fluid-Particle Systems by W C Yang, CRC Press.
3. Fluidization by M Leva, McGraw-Hill.
4. Fluidization by J F Davidson and D Harrison, Academic Press.

**Digital learning resources:**

1. Fluidization Engineering by Prof. S. K. Majumder, Department of Chemical Engineering, IIT Guwahati  
Link: <https://nptel.ac.in/courses/103/103/103103132/>