

# GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: III

## Chemical Engineering

Subject Name: **Catalysis (Major Elective –IV)**

Subject Code: **733002**

Sr. No	Course content
1.	Catalysts Properties. Types of Catalysts. Heterogeneous Catalytic Processes. Adsorption, adsorption isotherms, rates of adsorptions. Physisorption and chemisorptions.
2.	Kinetics of Catalytic Reactions., Finding Mechanism ,Rate limiting steps and Rate Law for Catalytic reactions. Laboratory reactors for studying Catalytic reactions.
3.	Deactivation of catalysts. Deactivation by Sintering (Ageing).Deactivation by Coking or fouling. Deactivation by Poisoning. Empirical Decay Laws Catalysts carriers, Promoters, Accelerators, Poisons and Inhibitors.
4.	Catalysts Preparations. Testing of Catalysts. Catalysts Characterisation methods. Surface area, Pore volume and adsorption capacity determination
5.	Industrial Catalytic Reactors. Packed Bed Reactors, Moving Bed Reactors Straight through Transport Reactors, Surface and Enzymatic reactors.
6.	New Developments in Solid Catalysts, monolith catalysts, nano catalysts, Fuel Catalysts, Environmental catalysts

### Text Book:

1. H.S. Fogler “Elements of Chemical Reaction Engineering” Prentis –Hall of India.

### Reference Books:

1. Lanny D. Schmidt “ The engineering of Chemical Reactions”. Oxford University press
2. Paul H. Emmett “Catalysis”.
3. G. Ertl, H. Knozinger and J. Weitkamp, “ Handbook of Heterogeneous Catalysis”, Vol.1- 5 Wiley – VCH.
4. B. Vishwanathan, S. Sivasanker, A.V. Ramaswamy, “ Catalysis : Principles and Applications” CRC Press.
5. Octave Levin spill “Chemical Reaction Engineering”.