

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.E. SEMESTER : VIII**  
**ENVIRONMENTAL SCIENCE & TECHNOLOGY**

**Subject Name: Chemical Kinetics & Reaction Engineering**

**Subject Code: 183502**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam(E)	University Exam(P)	Mid Sem Exam(Theory) (M)	Practical (Internal)
3	0	3	6	70	30	30	20

Sr No	Course Contents
1	Kinetic interpretation of experimental data using batch and continuous flow reactors for homogeneous reactions.
2	Reactor types: Batch, Semi-batch and Continuous Reactors and their sizing. Multiple reactors – series – parallel combinations.
3	Multiple reaction – series – parallel reactions, concept of instantaneous and overall yield, Reactor/reactors selection based on yield of the desired product.
4	Heat effects: Adiabatic and non-adiabatic operations, strategies for heat transfer for reactors for exothermic reactions.
5	Introduction to Heterogeneous catalysis

**Reference Books:**

1. Elements of Chemical Reaction Engineering, H. Scott Fogler. 4<sup>th</sup> Ed., 1992
2. Chemical Reaction Engineering Octave Levenspiel, Wiley Eastern Ltd. 3<sup>rd</sup> Ed., 2006
3. Chemical Process Technology, J Moulign, M Makkee and A Diepen, John Wiley & Sons, 2001
4. Introduction to Chemical Process Technology, P Berg and W Jong, Delft University Press, 1980
5. Introduction to Chemical Process : Principles, analysis and synthesis, R M Murphy, Mc Graw Hill, 2007
6. Industrial Chemical Process Design, Douglas Erwin, Mc Graw Hill, 2002
7. Unit Operations of Chemical Engineering, Warren McCabe, Jubian Smith and Peter Harriot, Mc Graw Hill, 7<sup>th</sup> Ed., 2004
8. Transport Processes & Unit Operations in Chemical Engineering ,Gean Koplis, Prentice Hall, 2003
9. Coulson and Richardson's Chemical Engineering Volume 1 - Fluid Flow, Heat Transfer and Mass Transfer , Coulson, J.M.; Richardson, J.F.; Backhurst, J.R.; Harker, J.H. Elsevier, 6<sup>th</sup> Ed., 1999
10. Coulson and Richardson's Chemical Engineering Volume 2 – Particle Technology and Separation Processes, B J Blackhurst & J H Harker, Elsevier, 5<sup>th</sup> Ed., 2002
11. Coulson and Richardson's Chemical Engineering Volume 3 – Biochemical Reactors & Process Control, B J Blackhurst & J H Harker, Elsevier, 3<sup>rd</sup> Ed., 1994

12. Coulson and Richardson's Chemical Engineering Volume 4 – Solutions to the Problems in Chemical Engineering from Vol- 1, B J Blackhurst & J H Harker, Elsevier, 2001
13. Coulson and Richardson's Chemical Engineering Volume 5 – Solutions to the Problems in Chemical Engineering from Vol- 2 and Vol-3, B J Blackhurst & J H Harker, Elsevier, 2001
14. Chemical Engineering Design Volume 6, R K Sinnott, Coulson and Richardson's Chemical Engineering Elsevier, 4<sup>th</sup> Ed, 2005