

Course Code	CP204			
Course Title	Chemical Reaction Engineering			
No. of Credits	3			
Pre-requisites	None			
Compulsory/Optional	Compulsory			
Aim(s): To provide the learner with essential knowledge and practice to understand Chemical Reaction Engineering concepts and calculations required for basic chemical reactor design.				
Intended Learning Outcomes:				
On successful completion of the course, the students should be able to				
ILO 1: Determine the parameters in kinetic expressions for different types of reactions.				
ILO 2: Formulate and apply the design equations for ideal reactor models in the presence of both single and multiple reactions				
ILO 3: Analyze single and series reactor systems in terms of space time and volume requirements.				
ILO 4: Estimate required heating and cooling loads in reactors				
ILO 5: Generate information experimentally for the design and scaling-up of chemical reactors				
ILO 6: Simulate reactor systems using modern engineering tools.				
Topics	Time Allocation/Hours			
	L	T	P	A
<ul style="list-style-type: none"> Chemical Kinetics Kinetics of chemical and biochemical reactions (such as elementary and non- elementary, reversible, irreversible, series and parallel). Temperature dependence of rate constant 	04	01		02
<ul style="list-style-type: none"> Reactor design Design of batch, semi-batch, continuous stirred tank and plug flow reactors with isothermal and non-isothermal operations. Reactor networks. Multiple reactions in reactor networks. Design of reactors for catalyst induced reactions, and multiphase reactions. 	18	05		06
<ul style="list-style-type: none"> Computer simulations Reactor design and computer simulation of reactors and reactor systems. 			20	
<ul style="list-style-type: none"> Chemical Laboratory Determination of reaction kinetic data, scaling-up. 			06	
Total equivalent hours	22	06	13	04
Recommended Texts:				
<ul style="list-style-type: none"> Froment, G. F., Bischoff, K. B., Wilde, J. De., Chemical Reactor Analysis and Design, (3 Ed). Wiley, John & Sons, 2010. Davis, M. E., Davis, R. J. J., Fundamentals of Chemical Reaction Engineering, (1 Ed), McGraw-Hill, 2003. Levenspiel, O., Chemical Reaction Engineering, (3 Ed), John Wiley and Sons (WIE), 1998. Richardson, J. F., Harker, J. H., Coulson and Richardson's Chemical Engineering Design, (5 Ed), Butterworth-Heinemann, 2002. 				
Assessment	Percentage Mark			
In-course Tutorials/Assignments/Quizzes/Laboratory work	40		40	

End-semester		60
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