



FEDERAL UNIVERSITY OF CEARÁ
Provost Office of Research and Graduate Studies

COURSE PROGRAM

1. PROGRAM:		
Program	GRADUATE PROGRAM IN CHEMISTRY	
2. COMPONENT TYPE:		
Activity ()	Course (X)	Module ()
3. LEVEL:		
	Master's Degree (X)	Doctorate (X)
4. COMPONENT IDENTIFICATION:		
Name:	CHEMICAL KINETICS	
Code:	CEP8022	
Hours:	64 horas	
Credits:	4	
Optional course:	Yes (X)	No ()
Compulsory course:	Yes (X)	No (X)
Area:	Physical Chemistry	
5. PROFESSOR:		
Pedro de Lima Neto, Norberto de Kássio Vieira Monteiro, Antoninho Valentin		
6. ABSTRACT:		
The fundamentals and the understandings of the experimental methods for monitor the kinetics of chemical reactions and the theoretical models used to fit the experimental data are present in this course, aiming to present the basic and applied knowledge of chemical kinetics in order to provide a good formation for the student of the Graduate Program in Chemistry.		
7. COURSE PROGRAM:		
Fundamental concepts of chemical kinetics. Experimental methods and treatment of experimental data. Kinetics laws of the elementary, sequential, parallel, reversible and chain reactions. Numerical analysis and simulation methods. Arrhenius' equation. Experimental determination of activation energy. Theory of the reaction in gas phase. Theory of the Activated-Complex-Transition State. Potential Energy Surfaces - Energy versus reaction coordinate diagrams. Applications. Unimolecular Reactions. Lindemann, Hinshelwood, Rice Ramsperger and Kassel (RRK) and Marcus (RRKM) theory. Surface reactions. Reactions in solution: solvent effects, box effect. reactions between ions, solvent effect, and saline effect. Surface reactions: heterogeneous catalysis and adsorption isotherms. Homogeneous catalysis: acid-base catalysis. Enzyme catalysis.		
8. EVALUATION PROCESS:		
Theoretical evaluation - 70% Seminars - 30%		
9. BIBLIOGRAPHY:		
1. LAIDLER, K.J. Chemical Kinetics. 3rd edition, New York: McGraw-Hill, 2003.		

2. Moore, J.W.; Pearson, R.G. - Kinetics and Mechanism. John Wiley & Sons, New York, USA, 1981.
3. Pilling, M.J.; Seakins, P.W. - Reaction Kinetics, Oxford Press, Oxford, UK, 1995. SKINGER, G. B. Introduction to chemical kinetics. New York: Academic Press, 1974.
4. HOUSTON, P. L, Chemical Kinetic and Reaction Dynamics, Dover Books, New York USA, 2006.
5. Steinfield, J.I.; Francisco, J.S.; Hase, W.L.- Chemical Kinetics and Dynamics, Prentice Hall, New Jersey, USA, 1999.