Curriculum - Academic Year 2018-19
Characteristics of the Course Units

Name	*Chemical Kinetics*
ECTS credits	*4*
Year / Semester	*I/1°*
Specific learning outcomes	*On successful completion of this module students should be able to:* *1- Understand the concept of rate of change associated with a given chemical reaction and how it can be measured.* *2- Recall and explain why certain factors such as concentration, temperature, medium and the presence of a catalyst will affect the speed of a chemical change.* *3- Determine rate law of chemical change based on experimental data.* *4- Be able to identify the reaction order for a chemical change.* *5- Understand the concept of pseudo-first order kinetics.* *6- Apply integrated rate equations to solve for the concentration of chemical species during a reaction of different orders.* *7- Understand the concept of mechanism and using rate law data predict whether or not a proposed mechanism is viable or not.* *8- Understand the concept of an activation energy in the context of the transition state and be able to calculate the activation energy given some experimental data.* *9- Recall, manipulate and properly employ the Arrhenius Law.* *10- Explain the function and purpose of a catalyst.*
Contents	– Some fundamental ideas of kinetics (reaction rate, chemical reaction classification, factors that affect reactions rate, activation energy, half-lives, molecularity, *Arrhenius law)*, – Formal kinetics (reaction order, kinetics laws, techniques and methods to determined reaction order, kinetics of more complex systems), – Theory of chemical kinetics (collision Theory and transition state theory), – Complex reactions kinetics (approximation methods, chain reactions …), – Catalysis (definitions, kinetics of catalyzed reaction, types of a catalyzed reaction).
Teaching and learning methods	*Face to face, 56 hours*
Teaching techniques	*Lectures, 24 hours* *Practical classes, 32 hours*
Assessment methods	*Written.* *A written tests and a final-term written exam are foreseen.* *The written tests and a final –term writen exam consists of exercise problems to be solved, which are similar to those presented during exercise sessions.*
Assessment criteria	*In the written tests, students should demonstrate their ability to interpret and analyse chemical reaction kinetics data.* *In the final term test, students will be required to solve a problem related to a complex*

	system.
Assessment metrics	*Attribution of a final grade*
Criteria of attribution of the final grade	*The final grade will be determined according to the following rules:* - *written tests: 20%* - *Final term written test: 50%* - *Practical work assessments: 30%*
Preparatory course units	*N.A.*
Didactic material	*J.I.Steinfeld, J.S.Francisco &W.L.Hase,"Chemical kinetics and dynamics", Prentice Hall, 1999.* *Vivek Patel, « Chemical Kinetics », In Tech, 2012*