

COURSE ID SHEET



Course No.	5240	NTUA							
Semester:	7	Core	X	Elective		Specialization			
Title:	CHEMICAL PROCESSES ENGINEERING II								
Aim:	Analysis and synthesis of physical and chemical phenomena leading to simulation and design of heterogeneous catalytic reactors.								
Content:	Heterogeneous Catalysis and Kinetics: • Catalysts – Definitions - Properties and characteristics of solid catalysts. Catalytic surfaces and reactions. • Adsorption. • Desorption. • Reaction mechanisms. • Kinetic modelling. • Catalyst deactivation. Heterogeneous Catalytic Reactors: • Ideal flow and batch catalytic reactors. • External mass transfer phenomena. • Diffusion inside solid catalysts and effectiveness factor. • Multiphase reactors and their characteristics. • Modelling of heterogeneous catalytic reactors and design equations. • Industrial and laboratory applications of catalytic reactors. Non-ideal Flow in Reaction Systems: • Residence time distribution. • Dispersion model. CSTR in series model. • Compartment models. • Non-ideal flow impact on conversion and reactor operation. Laboratory Exercises: • Six exercises are provided to be performed by all students during Chemical Reaction Engineering I and II courses. Laboratory exercises are a necessary part of science education. They enable students to better understand the principles discussed in lectures, and provide them with hands-on experience of the practical aspects of scientific research.								
Hours per semester:	LECTURES	26	EXERCISES	26	LABORATORY	19,5	HOME-WORK	108,5	TOTAL HOURS: 180
Student performance/evaluation:	The evaluation of the students will be done through: • A Final (written) Examination (FE), including the solving of exercises without using books or notes. • Evaluation of the Laboratory Exercises (LE). The Final Grade results as follows: Final Grade = 0.7 x (FE) + 0.3 x (LE)								