

COURSE ID SHEET



Course No. **5225**

NTUA

Semester:

4

Core

X

Elective

Specialization

Title:

CHEMICAL KINETICS & ELECTROCHEMISTRY

Aim:

The aim of this course is the study of (a) rates and mechanisms of chemical reactions (homogeneous, heterogeneous and catalytic) and the factors influencing the rate, yield and conversion and (b) properties of electrolytic solutions, electrochemical interfaces, electrolytic and galvanic cells and kinetics of electrode processes.

Content:

Categories of chemical reactions. Description of homogeneous, heterogeneous and electrochemical reactions. Chemical reactions at equilibrium. Electrode potentials. Description of the electrochemical interface. Dependence of the rate on temperature – activation energy. Theories of reaction rates – collision theory, transition state theory. The order of chemical reactions. Reaction mechanisms – steady state and partial equilibrium approximations. Electrolytic solutions and Debye-Huckel theory. Mass transport in electrolytic solutions. Homogeneous catalysis – acid/base and enzymatic catalysis. Mechanisms of heterogeneous reactions. Effect of electrode potential on electrochemical reaction rates. Mechanisms of electrochemical reactions. Electrolytic and galvanic cells in operation.

Hours per semester:

LECTURE	52	EXERCISES	26	LABORATORY	20	HOME-WORK	112	TOTAL HOURS: 205
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Student performance /evaluation:

Written examination at the end of the course (60% contribution to the final grade). Passed laboratory course is required (40% contribution to the final grade).