CHEM 345 Syllabus

Course Code	Course Name	Credits	Prerequisite(S)	Classification
CHEM 345	Solid State and Surface Chemistry	2	CHEM 241	Department Requirement

Course Description	The course aims to give the students the basic principles in solid state, surface chemistry, colloids, and catalysis.
Class Scheduling	Classes are held two times/week, each for 50 minutes.
Textbook	1- Physical Chemistry, J. de Paula & P. Atkins, 7th ed., 2001, W. H. Freeman. 2- Introduction to Surface Chemistry and Catalysis, G. A. Somorjai, 1994, Wiley-Interscience. 3- Physical Chemistry, W. Moore, and Lands.
Course Coordinator	Dr. Soha Albukhari Dr. Abdulmohsen Alshehri Dr. Qana Alsulami

Relationship to SOs

1	2	3	4	5	6
X		X			X

CLOs

By the end of this course student will be able to:

CLO1. Apply knowledge of the solid-state, surface chemistry, colloids, and catalysis. (SO1)

CLO2. Identify crystal systems, modern processes in solid-state and surface chemistry, and the relationship between solid-state and other disciplines. (SO1)

CLO3. Analyze all data in solid-state, surface chemistry, colloidal state, and catalysis. (SO3)

CLO4. Solve problems using the given mathematical formulas. (SO3)

CLO5. Compare different techniques used in solid-state, surface chemistry, colloidal state, and catalysis. (SO3)

CLO6. Contribute to teamwork, group discussion, and scientific communication oral skills. (SO6)

Contents

List of Topics	No. of Weeks
Introduction to solid state, crystal system, unit cell Crystal Planes and Miller Indices	2
Crystal Structure by X-ray diffraction Structure of metals and cubic system	1
Band theory of solids and types of semiconductors	2
Introduction to surface chemistry and adsorption	1
Adsorption isotherm and adsorption with dissociation, Langmuir equations	1
Adsorption isotherm and adsorption with dissociation, BET equations	1
Surface techniques	1
Catalysis and homogeneous catalysis	1
Kinetics of heterogeneous catalyst	1
Enzyme catalysis and catalyst properties	1
Introduction to Colloid Chemistry, Lyophobic, and Lyophilic sols	1
Scattering by colloidal particles, Properties of colloidal systems	1
Presentation	1