CHE-915 Colloids & Surface Chemistry

Credit Hours: 3
Prerequisites: Nil

Course Objectives:

- Introduction to modern surface science methods and their application to current research topics
- Understand chemical and physical phenomena particular to surfaces and interfaces
- Critical interpretation of surface analysis data and surface science research reports

Course Contents:

- Self-assemblies systems
- Intro to the behavior of molecules adsorbed on solid surfaces
- Structure of surfaces and adsorbed layers
- The bonding of molecules to surfaces
- Adsorbed phase transition
- Trapping and sticking of molecules on surfaces
- Kinetics of surface reactions and reactivity of surfaces
- Review of principles of chemical reactivity
- Prediction of rates and mechanism of reactions on metals, semiconductors and insulators
- Preparation of nanoporous materials

Course Outcomes:

The student will obtain an understanding of interactions between surfaces and gases, liquids or solutions, and how interfaces are important in many technological and biological processes. The student will be able to use this knowledge in practical applications.

Recommended Books:

- Surface Science: Foundations of Catalysis and Nanoscience by Kurt W., 2002
- Principles of Colloids and Surface Chemistry, 3rd Edition, Paul C. Heimenz, Raj Rajagopalan, (1997)
- Surface Chemistry essentials, K.S.Birdi, 2013.
- Colloids and Interfacial Chemistry for Nanotech, Peter Kralchersky, Reinhard Miller, Francesca Ravera, 2013.