CH-428 Thin Films Chemistry

Credit Hours: 3-0

Prerequisite: Nil

Course Objectives:

This course is specifically designed to make the students understand the importance, processes involved and instrumentation with vacuum science and surface engineering. Physical and chemical aspects of Vacuum physics in engineering the surfaces.

Course Contents:

Introduction to Physical Vapor Deposition (PVD), Adsorption and Condensation, Principles of High Vacuum, Operation Principles of Vacuum Pumps and Gauges, Evaporation Sources, Pulsed Laser Deposition, Sputtering Discharges, Plasma Sputtering, Chemical Vapor Deposition, Physically Enhanced Chemical Vapor Deposition (PECVD), Low Pressure Chemical Vapor Deposition (LPCVD), Ion plating and Ion Beam, Assisted Deposition, Film Growth, Micro and Nano structure of films. Post Deposition Processing. Testing of films.

Course Outcome:

The course comprises of vacuum physics basic concepts, thin film deposition processes, testing and characterization of films by chemical and mechanical methods of characterization of films

Recommended Text Books:

1) John E. Mahan, *Physical Vapor Deposition of Thin Films, John Wiley and Sons, 2000*

2) Donald M. Mattox, *Handbook of Physical Vapor Deposition (PVD) Processing (Materials Science and Process Technology Series) Noyes Publications, 1998*

3) K.S. Sree Harsha, *Principles of Vapor Deposition of Thin Films, Elsevier*

Science, 2006

4) John Vacca, *Nanotechnology: Materials, Systems, and Processes at the Nano-Scale,Butterworth Heinmann*