18MTE62	THIN FLIMS,COATINGS AND APPLICATIONS	L	T	P	C
		3	0	0	3

Course Objectives:

1. To study about thin flims, coatings and application techniques.

UNIT I	INTRODUCTION	9	+	0

Need for miniaturization, Basics of thin film, Brief review of kinetic theory of adsorption, desorption, film growth: nucleation and growth kinetics. Vacuum science and technology, vacuum pumps, surface: role of substrate surface, substrate cleaning. Epitaxy, thin film growth control,

UNIT II	TECHNIQUES OF COATING	9	+	0

Physical vapor deposition (PVD) processes, evaporation: thermal and e-beam. Principles of glow discharge and various sputtering processes. Fundamentals of Chemical Vapor Deposition (CVD) processes.

UNIT III	OTHER TECHNIQUES	9	+	0

Pulsed laser deposition (PLD), other techniques: electro-deposition, spin coating, sol-gel, Langmuir Blodgett (LB) techniques, SILAR technique, Doctor blade technique, printing.

UNIT IV	HARD COATINGS	9	+	0

Hard coating: physical, mechanical and protective properties, basic thin film thickness measurement, microstructural characterization of films/coating.

UNIT V	APPLICATIONS	9	+	0

Thin film devices: optoelectronicdevices, photo-detectors, solar cells. Applications: high hardness, corrosion resistance, biocompatibility and high temperature stability.

Total (L+T) = 45 Hours

Course Outcomes:

Upon completion of this course, the students will be able to:

CO1	:	Explain the basics of adsorption, desorption and need of vacuum
CO2	:	Describe the principles, process and advantages of different techniques
CO3	:	Know about various hard coating techniques

CO4	:	Identify thin flim devices and applications of it.

Text Books:	
1.	Milton Ohring, Materials Science of Thin Films, 2nd Edition, Academic Press, 2001
2.	Hartmut Frey and Hamid R Khan, Handbook of Thin Film Technology, Springer,2016
Reference Books:	
1.	K. L. Chopra & L. K. Malhotra, Thin film Technology and Application, Tata McGraw-Hill, 1985
2.	Peter M. Martin, Handbook of Deposition Technologies for Films and Coatings, Elsevier, 1994
3.	Sam Zhang, Nanostructured Thin Films and Coating, CRC Press, 2010