MS4651 – Thin Film Technology

Course Code	MS4651					
Course Title	Thin Film Technology					
Pre-requisites	NIL					
Pre-requisite for	NIL					
No of AUs	3					
Contact Hours	Lectures	26	Tutorials	13		

Course Aims

This course aims at developing comprehensive understanding on thin film deposition principles and techniques. You will gain a fundamental view on the thin film growth process as well as the microstructure that has been developed during the deposition process. The course will help you develop the skills to design thin film systems and select appropriate deposition techniques based upon materials composition, microstructures and properties.

Intended Learning Outcomes (ILO)

By the end of this course, you (as a student) would be able to:

1. Explain the molecular behaviours in different vacuum conditions for gas-phase deposition techniques of thin films.
2. Propose appropriate deposition methods for a targeting thin film structure with desirable properties.
3. Explain the principles of different film deposition techniques.
4. Describe the general thin film growth process and evaluate the microstructure evolution during deposition.
5. Choose the right tools to perform thickness measurement of different thin films and characterize their optical properties.

Course Content

Vacuum, physical vapor deposition (evaporation and sputtering), chemical vapor deposition, thin film growth and microstructure, epitaxy, liquid phase deposition, characterization methods, thin film properties.

Reading and References

Suggested reading:

1. M. Ohring, The Materials Science of Thin Films, 2nd Edition, 2001, Academic press
2. D. L. Smith, Thin-film deposition, principles and practice, 1995, McGraw-Hill
3. K. Seshan, Handbook of Thin-Film Deposition Processes and Techniques, 2002, William Andrew Publishing
4. K. S. Sree Harsha, Principles of Vapor Deposition of Thin Films, 2006, Elsevier

Course Policies and Student Responsibilities

1. It is your responsibility to be aware of and attend each continual assessment exercise. Make up CA will be conducted for those with approved reasons for the absence.
2. Although the lectures are recorded, the lecturer highly appreciate every physical attendee.
3. Every year there are requests regarding the provision of model answers to questions in past year exam papers. Due to the prodigious ability of many students to memorize and reproduce large tracts of text without comprehension of the content, we do not provide model answers to past exam questions.
4. Please note that due to syllabus changes, questions found in previous exam papers may not be relevant. If the material has not been covered in the current year, it will not be examined.

Academic Integrity

Good academic work depends on honesty and ethical behavior. Quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honor Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student of NTU, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at the University. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, and collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the academic integrity website for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.