MS1018 – Properties of Materials

Course Code	MS1018					
Course Title	Properties of Materials					
Pre-requisites	NIL					
Pre-requisite for	NIL					
No of AUs	2					
Contact Hours	LECTURES	20 hrs	TUTORIALS	8 hrs		

Course Aims

The main aim of this course is to further correlate the structure of materials to their electrical, thermal, optical and magnetic properties. The course will highlight the importance of careful design of the materials structure to harness the associated properties in real application examples. Understanding of these relationships helps you to achieve different functional properties in a given materials combination/system for a specific application that is necessary for a materials engineer.

Intended Learning Outcomes (ILO)

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

1. Explain the electrical properties of materials based on band theory.
2. Apply calculations to determine the electrical conductivity of metals and semiconductors.
3. Evaluate BH curves of magnetic materials.
4. Determine the thermal properties of materials based on their density, bond strength and types of bond.
5. Determine optical properties of solid materials based on the materials classes, crystal structures and bonds.
6. Evaluate the link between materials structure and their associated properties.

Reading and References

Suggested reading:

Materials Science and Engineering, 10th Edition, SI Version, Willian D. Callister, David G. Rethwisch, 2018, John Wiley & Sons Inc.

Additional reading:

Introduction to Materials Science for Engineers, James F. Shackleford, 8th Edition, Global Edition, Pearson.

Course Policies and Student Responsibilities

(1) Group Project Assignment

Students are given sufficient time to prepare group project to complete submission before deadline.

(2) CA

Absentees must be supported by a medical certificate or other valid official documents.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour 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, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. 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, 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.