

## MS1013 – Materials Chemistry I

<b>Course Code</b>	MS1013					
<b>Course Title</b>	Materials Chemistry I					
<b>Pre-requisites</b>	NIL					
<b>Pre-requisite for</b>	MS4664	Environmental Sustainability & Materials				
	MS4666	Sustainable Development in Water, Agriculture and Aquaculture				
<b>No of AUs</b>	2					
<b>Contact Hours</b>	LECTURES	20	TUTORIAL	8 hrs		
		hrs				

### Course Aims

The aim of this course is to provide you with fundamental understanding of basic chemistry which includes inorganic chemistry, physical chemistry, and analytical chemistry.

### Intended Learning Outcomes (ILO)

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

1. Write and balance chemical equations and perform stoichiometric calculations.
2. Identify the nomenclature of common inorganic compounds.
3. Compare reactivities of metals based on their electronic structures.
4. Interpret properties of inorganic compounds based on periodic relationships among the elements.
5. Determine rate law and integrated rate law expressions and interpret reaction mechanisms.
6. Determine equilibrium constants, perform calculations involving solubility including  $K_{sp}$ , and apply Le Chatelier's Principle.
7. Distinguish strong and weak acids and bases, and perform calculations to determine concentrations, pH,  $K_a$ , etc.
8. Apply acid-base titration in analytical chemistry.

### Course Content

It introduces basic chemistry concepts and theories that are important for understanding of the chemistry of materials. The inorganic chemistry part includes an introduction to basic chemistry concepts, atomic orbital theory, and periodic relationships among the elements. The physical chemistry includes basic concepts of thermodynamics and kinetics, and the analytical chemistry covers acids and bases and the use of acid-base titration as an analytical method.

### Reading and References

Chang, Raymond, Chemistry, 11th Edition, McGraw-Hill, 2012 (Call no.: QD31.2.C456 2013)

### Course Policies and Student Responsibilities

For CAs, all non-attendance 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.