

The Hong Kong University of Science and Technology  
Department of Chemistry

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CHEM 1020 – General Chemistry IB (3-credits)

Summer 2020 -2021

**Instructors:** Prof. Emily Ming Wai Tsang (chetsang@ust.hk)

**Course Description:**

This course targets at students who have acquired more advanced knowledge in fundamental Chemistry in high school. Key topics include atomic structure and periodicity, bonding theories, chemical energy, and properties of gases, liquids and solids. Other topics such as chemical kinetics, chemical equilibrium and organic molecules will be briefly reviewed.

**Pre-requisites:** Level 3 or above in HKDSE 1x Chemistry

**Exclusions:** CHEM 1010

**Lecture:** Mon, Wed & Fri, 14:00 – 16:50 through ZOOM meetings (details on CANVAS)

**Instructor Office Hours:** By email.

**Textbook:** *Chemistry: An Atoms First Approach*, 3<sup>rd</sup> Asian Ed. S.S. Zumdahl; S. A. Zumdahl; D. DeCoste © Cengage Learning. ISBN: 9789814896993

**Course Content/Topics:**

- Chapter Review: Measurement and Calculations in Chemistry
- Chapter 1: Chemical Foundations
- Chapter 2: Atomic Structure and Periodicity
- Chapter 3: Bonding - General Concepts
- Chapter 4: Molecular Structure and Orbitals
- Chapter 5: Stoichiometry
- Chapter 6: Types of Chemical Reactions and Solution Stoichiometry
- Chapter 7: Chemical Energy
- Chapter 8: Gases

**Intended Learning Outcomes:**

Upon successful completion of this course, students are expected to be able to:

1. Describe and apply fundamental principles and terminologies of chemistry.
2. Develop a microscopic view of the world in terms of atoms and molecules and their change
3. Describe and apply concepts of mass conservation and energy conservation in chemical changes.
4. Describe the atoms and ions in terms of atomic structure, atomic orbitals, electron configuration, and periodicity of chemical properties

5. Describe molecules in terms of bonding theory, energy, molecular geometry and interactions.
6. Describe a chemical reaction from an equilibrium, thermodynamic and kinetics point of views.
7. Describe the physical states of matters: gases, liquids and solids.
8. Recognize and appreciate the impact of chemistry to our society.

### Course Grading Scheme

Midterm Exam	50 %
Final Exam	50 %