SCCH 161 General Chemistry

First Semester Academic Year 2025 - Faculty of Science, Mahidol University

Student Groups Biomedical Science (BM)
Bio-Innovation (IN)
Materials Science and Nano Engineering (ME)

Class Schedule Thursday 13:30-16:30

Instructors Assoc. Prof. Panida Surawatanawong Email: panida.sur@mahidol.ac.th
Assoc. Prof. Pasit Pakawatpanurut Email: pasit.pak@mahidol.ac.th
Assoc. Prof. Taweechai Amornsakchai Email: taweechai.amo@mahidol.ac.th

Course Description

This course emphasises the general principles in chemistry, which include such topics as atomic structure, chemical bonding, gases and kinetic molecular theory of gases, phase equilibria, solutions and colloids, chemical thermodynamics, chemical kinetics, ionic equilibria, electrochemistry, and the basics of organic molecules and their importance to life. Relevant applications of the principles covered in the course are also discussed whenever appropriate. Students are highly encouraged to engage with class discussions.

Grading Policy

Student evaluation is in accordance with the rules and regulations of the Faculty of Science, Mahidol University. Letter grades of A, B+, B, C+, C, D+, D, and F will be given according to the student's score.

Score consists of:

Quiz/Assignments	20%
Midterm Exam	40%
Final Exam	40%

Textbooks

Recommended

1. Chang, R, Goldsby, K.A. Chemistry. 12th Edition. New York: McGraw-Hill, 2016.
2. Middlecamp, C.H. et al. Chemistry in Context: Applying Chemistry to Society. 8th Edition. USA: McGraw-Hill. 2015.
3. Hill, J.W. and Petrucci, R.H. General Chemistry, An Integrated Approach. 3rd Edition. USA: Prentice Hall. 2002.
4. Atkin, P.W. Atkin's Molecules. 2nd Edition. UK: Cambridge University Press. 2003.

Course Timetable

Thursday 13:30-16:30 | 7 August to 27 November 2025

Date (2025)	Topics	Instructor
7 Aug	Atoms, Molecules, and Ions: the atomic theory, the periodic table, chemical formulas, naming compounds, introduction to organic compounds	Panida
14 Aug	Mass Relationship in Chemical Reactions: atomic mass, molecular mass, percent composition of compounds, chemical reactions and equations, limiting reagents, reaction yields	Panida
21 Aug	Chemical Bonding I: concept of resonance, molecular geometry, valence bond theory, hybridisation of atomic orbitals, molecular orbital theory	Panida
28 Aug	Chemical Bonding II: shapes and structures, chemical, intramolecular vs. intermolecular interactions, complexation, physical properties	Panida
4 Sep	Gas properties, Gas law	Panida
11 Sep	Partial pressure, Phase, The three states of matter	Panida
18 Sep	Liquid, Solid, Crystal structure	Panida
25 Sep	Phase equilibria, Phase diagram, Thermal properties of matters	Panida
29 Sep - 3 Oct 2025 --- Midterm Exam ---		
9 Oct	*Graduation Commencement Day (no class)*	
16 Oct	Solutions and colloids: the solution process, solubility, and colligative properties	Pasit
23 Oct	*King Chulalongkorn Memorial Day (no class)*	
30 Oct	Ionic equilibria: equilibrium constant, and factors that affect chemical equilibrium, definitions of acids and bases, ionization constant, molecular structure and the strength of acids	Pasit
6 Nov	Thermochemistry: introduction to thermochemistry, enthalpy and chemical reactions, the three laws of thermodynamics, and Gibbs free energy and the chemical equilibrium	Pasit
13 Nov	Chemical kinetics: the rate of reaction and the rate law, the relationship between reactant concentration and time, activation energy, and reaction mechanisms	Taweechai
20 Nov	Electrochemistry: redox reactions, galvanic cells, and standard reduction potentials,	Taweechai
27 Nov	Electrochemistry: Spontaneity of redox reactions, and the effect of concentration on cell EMF	Taweechai
1-12 Dec 2025 --- Final Exam ---		