SCCH 161 General Chemistry

First Semester Academic Year 2022, Faculty of Science, Mahidol University

Student Groups Bio-Innovation (IN) #38
Bioresources and Environmental Biology (BE) #16
Materials Science and Nano Engineering (ME) #10

Class Schedule Thursdays 13:30-16:30
Classroom Line group: Y22-INBEME-SCCH161
Google Classroom passcode: vb7imcw
https://classroom.google.com/c/NDg4NjI4Njc4NzY3?cjc=vb7imcw

Instructors Assoc. Prof. Panida Suwawatanawong (panida.sur@mahidol.edu)
Assoc. Prof. Taweechai Amornsakchai (taweechai.amo@mahidol.edu)

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.
5. Brady, J.E. and Holum, J.R.. Descriptive Chemistry of the Elements. USA: John Wiley & Sons, Inc

Course Timetable

Thursdays 13:30-16:30 (11 August to 1 December 2022)

Date (2022)	Topics	Instructor
11 Aug	Atoms Molecules, and Ions: The atomic theory, The periodic Table, Chemical Formulas, Naming Compounds, Intro. Organic compounds	Siwaporn
18 Aug	Mass Relationship in Chemical Reactions: Atomic mass, Molecular Mass, Percent composition of compounds, Chemical reactions and equations, Limiting reagents, Reaction yields	
25 Aug	Chemical Bonding I: concept of resonance, molecular geometry, valence bond theory, hybridisation of atomic orbitals, molecular orbital theory	
1 Sep	Chemical Bonding II : shapes and structures, chemical, intramolecular vs. intermolecular interactions, complexation, physical properties	
8 Sep	Phase, The three states of matter	
15 Sep	Gas law	
22 Sep	Phase equilibria, Crystal structure	
29 Sep	Phase diagram, Intro. Thermal properties of matter	
3-7 Oct 2022 --- Midterm Examination		

Course Timetable (cont') Thursdays 13:30-16:30

Date (2022)	Topics	Instructor
13 Oct	Holiday – No class	Pasit
20 Oct	Solutions and colloids: the solution process, solubility, and colligative properties	
27 Oct	Thermochemistry: introduction to thermochemistry, enthalpy and chemical reactions, the three laws of thermodynamics, and Gibbs free energy and the chemical equilibrium	
3 Nov	Chemical kinetics: the rate of reaction and the rate law, reaction mechanisms, the relationship between reactant concentration and time, activation energy, and reaction mechanisms	
10 Nov	Ionic equilibria: equilibrium constant, and factors that affect chemical equilibrium, definitions of acids and bases, ionization constant, molecular structure and the strength of acids	
17 Nov	Ionic equilibria: molecular structure and the strength of acids	
24 Nov	Electrochemistry: redox reactions, galvanic cells, and standard reduction potentials,	
1 Dec	Electrochemistry: Spontaneity of redox reactions, and the effect of concentration on cell EMF	
6-16 Dec 2022 --- Final Examination		