SCCH 161 General Chemistry

First Semester Academic Year 2024 - Faculty of Science, Mahidol University

Student Groups	Bio-Innovation (IN) #30 Materials Science and Nano Engineering (ME) #17
Class Schedule	Thursdays 13:30-16:30 Google Classroom: 2024 SCCH161 SCBE-IN-ME (Class code: 4ixscgn) https://classroom.google.com/c/NzAxODgxNDQ3NDAw?cjc=4ixscgn
Room	SC1-161
Instructors	Assoc. Prof. Panida Surawatanawong Email: panida.sur@mahidol.edu Assoc. Prof. Taweechai Amornsakchai Email: 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.

Course Timetable

Thursdays 13:30-16:30 - 8 August to 28 November 2024

Date (2024)	Topics	Instructor
8 Aug	Atoms Molecules, and Ions: The atomic theory, The periodic Table, Chemical Formulas, Naming Compounds, Intro. Organic compounds	Panida
15 Aug	Mass Relationship in Chemical Reactions: Atomic mass, Molecular Mass, Percent composition of compounds, Chemical reactions and equations, Limiting reagents, Reaction yields	Panida
22 Aug	Chemical Bonding I: concept of resonance, molecular geometry, valence bond theory, hybridisation of atomic orbitals, molecular orbital theory	Panida
29 Aug	Chemical Bonding II : shapes and structures, chemical, intramolecular vs. intermolecular interactions, complexation, physical properties	Panida
5 Sep	Phase, The three states of matter	Panida
12 Sep	Gas law, Crystal structure	Panida
19 Sep	Structure, Thermal properties of matters	Panida
26 Sep	Phase equilibria, Phase diagram,	Panida
--- Midterm Exam ---		
10 Oct	Solutions and colloids: the solution process, solubility, and colligative properties	Taweechai
17 Oct	Thermochemistry: introduction to thermochemistry, enthalpy and chemical reactions, the three laws of thermodynamics, and Gibbs free energy and the chemical equilibrium	Taweechai
24 Oct	Chemical kinetics: the rate of reaction and the rate law, reaction mechanisms, the relationship between reactant concentration and time, activation energy, and reaction mechanisms	Taweechai
31 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	Taweechai
7 Nov	Ionic equilibria: molecular structure and the strength of acids	Taweechai
14 Nov	Electrochemistry: redox reactions, galvanic cells, and standard reduction potentials,	Taweechai
21 Nov	Electrochemistry: Spontaneity of redox reactions, and the effect of concentration on cell EMF	Taweechai
28 Nov		
--- Final Exam ---		