The Hong Kong University of Science and Technology (Guangzhou)

UG Course Syllabus

Course Name & Code: General Chemistry, UFUG 1301

Semester: Spring 2026

Credits: 3

Course Coordinators:

Qixing JI (qixingji@hkust-gz.edu.cn): lecture, logistics, grading

Yunjuan ZHANG (yunjuanzhang@hkust-gz.edu.cn): lab-related issues

Meeting Time, Instructors & Venue:

Session	Meeting Time	Instructors	Venue
L01	Friday 09:00 – 11:50	Qixing JI (qixingji@hkust-gz.edu.cn); Qiao He (qiaohe@hkust-gz.edu.cn); Quanfu He (quanfuhe@hkust-gz.edu.cn)	Lecture: E1 – 102 Lab sessions: E3-232 B/C
L02	Monday 13:30 – 16:20	Ting FANG (tingfang@hkust-gz.edu.cn); Chang YAN (changyan@hkust-gz.edu.cn);	
Tutorial	Friday 18:30 – 19:20		W4-102

Office Hours:

Wednesday 13:30 – 14: 30, E3-304

TA information:

Xinhui LIU (xliu610@connect.hkust-gz.edu.cn); Le YANG (lyang346@connect.hkust-gz.edu.cn);

Course Description

This course serves as a gateway to basic chemical theories and principles, demonstrating a microscopic view to the materialized world that built from atoms. Starting from chemical notation and units, lectures will introduce nuclei structure and elemental periodicity, redox reactions, basic inorganic and organic substances with associated chemical bonding and forms, fundamental properties of gases, acid/base theories, chemical kinetics and equilibrium, principles of thermodynamics, and electrochemistry. Additionally, two mini labs providing hands-on experience supplement the lecture materials.

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

(1) Identify and distinguish the physical and chemical properties of matter in solid, liquid and gaseous forms;

(2) Describe elemental periodicity explain the arrangement of the periodic table;

(3) Balance a chemical equation by chemical stoichiometry and valence change during redox reactions;

(4) Categorize organic compounds in terms of bonding, structure and energy;

(5) Apply principles of acid-base chemistry to quantitatively predict reactions between acids and bases;

(6) Understand key concepts of chemical equilibrium and kinetics, and to exemplify using an electrochemical reaction;

(7) Develop the microscopic view of the world in terms of elements, atoms and molecules, together with the notion of mass and energy conservation in chemical reactions.

(8) Access and acquire course relevant information from reference books independently, and communicate the above knowledge to both professionals and laymen.

Assessment and Grading

This course will be assessed using criterion-referencing and grades will be assigned according to university policy and regulations. Details for each assignment are provided below.

Assessments and mapping of Course ILOs:

Assessment Task	Contribution to Overall Course grade (%)	Due date	Explanation	Mapped ILOs
Mid-Term	25%	Mar. 14 or 15	Comprehensively evaluates students' learning of the first half of the semester	ILOs 1,2,3,5,6
lab report # 1	10%	Mar. 16/20	Presents experiential learning to three phases of matter and their inter-reactions (ILO1, 3 &5), as well as deepening students' understanding of chemical kinetics (ILO6)	ILO1, ILO3, ILO5, ILO6
lab report # 2	10%	Apr. 20/24	Presents experiential learning to organic-inorganic reactions in solutions (ILO1&4), as well as deepening students' understanding of chemical kinetics (ILO6)	ILO1, ILO4, ILO6
problem set # 1	10%	Mar. 10	Helps deepen students' understanding of matter and inter-reactions (ILO1, 3 & 5), the mechanisms behind chemical reactions (ILO2), and links to daily life examples (ILO8)	ILO1, ILO2, ILO3, ILO5, ILO8
problem set # 2	10%	Apr. 30	Helps deepen students' understanding of chemical reactions among inorganic and organic matter (ILO1, 3 & 4), explained by microscopic mechanisms (ILO 6&7)	ILO1, ILO3, ILO4, ILO6, ILO7
Final examination	35%	TBD	Final exam comprehensively evaluates students' learning of the entire course	ILOs 1-8

Grading Rubrics

Detailed rubrics for each assignment will be provided. These rubrics clearly outline the criteria used for evaluation. Students can refer to these rubrics to understand how their work will be assessed.

Final Grade Descriptors:

As appropriate to the course and aligned with university standards

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	Demonstrates a comprehensive grasp of course materials, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.
B	Good Performance	Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.
C	Satisfactory Performance	Possesses basic knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.
D	Marginal Pass	Has threshold knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic judgments. Benefits from the course and has the potential to develop in the discipline.
F	Fail	Insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet the threshold requirements for professional practice or development in the discipline.

A+ : Overall course grade ≥ 90

A & A- : Overall course grade ≥ 80

B(B+, B, B-): Overall course grade ≥ 70

C: Overall Course Grade ≥ 60

D: Overall Course Grade ≥ 50

F: Overall Course Grade < 50

Other subgrades (e.g. A-, B+, etc.) will be assigned based on the outcome of the overall course grades

Course AI Policy

Students are allowed to use artificial intelligence (AI) tools (e.g.,ChatGPT) to enhance their learning experience and course performance. However, if AI tools are adopted for any assignment, students must **provide a statement** briefly describing how the AI tools were used, including the exact prompts used and the rationale for the choices made. Screenshots of the prompts and outputs should also be attached. An example of the statement can be found on Canvas: Statement_of_GenAI_use_example.pdf.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include strengths and weaknesses, areas for improvement. Students who have further questions about the feedback including marks should consult the instructor within five working days after the feedback is received.

Resubmission & Late Submission Policy

Submission of assignments and lab reports is done electronically via Canvas. Resubmission is allowed on Canvas before the deadline, and grading is based on the **last submission before the deadline**. The total points of the late submission will be deducted by 20% per day. For example, if a student submits an assignment 1.5 days late, the score will reflect a 1.5*20%=30% late submission deduction.

Supporting Texts and Materials

Brown et al., (2022). Chemistry: The Central Science. 15th edition, Pearson Education Limited; Use LibreTexts at the following URL, https://chem.libretexts.org/@go/page/21655

Additional: Steven S. Zumdahl, Susan A. Zumdahl, Donald J. DeCoste (2021). Chemistry: An Atoms First Approach, 3rd edition, Cengage Learning, Inc.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST(GZ)'s Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Regulations for Academic Integrity and Student Conduct for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

Class Schedule (Tentative)

Week	Topic	Remarks (Chapter # as Libretexts)	L02 Date (mm/dd)
1	Course introduction and chemical notation	chapter 1	01/26
2	Fundamental particles, nuclei structure, radiation	chapter 2; chapter 21.1 – 21.4	02/02
3	Elemental periodicity and periodic table	chapter 5, 6, 7	02/09
4	Chemical compounds, stoichiometry, oxidation states, redox reactions	chapter 3; chapter 20.1 – 20.2	02/28
5	Acid/base theories	chapter 4; 13 chapter 16.1 – 16.4	03/02
6	Principles of gases & Laboratory #1 Measure ideal gas constant	chapter 10, 11	03/09
	Mid-term exam	1.5 hr closed book	
7	Inorganic Chemistry	chapter 8, 22, 23	03/16
8	Organic Chemistry	chapter 24	03/23
9	Chemical kinetics, equilibrium and aqueous chemistry	chapter 4, 14, 15, 16, 17;	03/30
10	Laboratory #2 Measure hardness of tap water by titration		04/13
11	Principles of thermodynamics	chapter 19, 20	04/20
12	Electrochemistry	chapter 19, 20	04/27
13	Application of chemical knowledge in daily life and research	chapter 12, 18 Flipped classroom for student presentation (Organic reactions)	05/11
	Final exam	2.0 hr closed book	