Academic Inquiries: Nanchang University
Email:iss@ncu.edu.cn

Nanchang University
CHEM11: General Chemistry
(Last Updated in Jan. 2025)

Credit: 4

Contact Hours

This course is composed of 24 lecture sessions, 3 tutorial sessions and 9 office contact hours. Each lecture session takes 2 contact hours in length; each tutorial session takes 3 contact hours in length;There will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours) at the end of this term. This course has 72 contact hours in total.

Course Description

The course will introduce the student to the world of chemistry, with emphasis on the structure of matter. Problem solving, data evaluation, and analysis are stressed. Applications of chemistry to daily life are included. The lab complements topics in lecture, with lab calculations providing opportunity to use the data the students have gathered.
Be prepared to purchase protective goggles and bring your lab manual.

Note: This Syllabus is subject to change based on the needs of the class.

Required Textbook

Textbook: *General Chemistry: The Essential Concepts*, by Raymond Chang, 6th Edition

Grading

• Participation	10%
•Quizzes	20%
•Labs	20%
•Midterm	25%
•Final Exam	25%

A+ 96-100	A 90-95	A- 85-89
B+ 82-84	B 78-81	B- 75-77
C+ 71-74	C 66-70	C- 62-65
D 60-61	F < 60	

Course Schedule

The course has 24 class sessions in total. All sessions are 2 contact hours in length. At the end of this term, there will be a Q-A review session(3 contact hours) and Final Exam (3 contact hours).
Note: the course outline and required readings are subject to change.

Class 1:
Introduction of scientific method, measurement and the metric system Ch. 1

Class 2:
Dimensional analysis, significant figures and laboratory calculations Ch. 1

Class 3:
Overview of elements, compounds, physical and chemical change Ch. 1

Class 4:
Structure of the atom, isotopes, periodic table and molecules Ch. 2

Class 5:
Structure of ions and nomenclature Ch. 2

Class 6:
Atomic mass, % composition, moles Ch. 3
Quiz 1

Class 7:
Avogadro's number, molar mass, determining empirical formulas Ch. 3

Class 8:
Chemical reactions and chemical equations Ch. 3

Class 9:
Limiting reagents and yields Ch. 4
Quiz 2

Class 10:
Aqueous solutions, Precipitation reactions Ch. 4

Class 11:
Acid base reactions, Oxidation reactions Ch. 4

Class 12:
Molarity, gravimetric analysis Ch. 4

Class 13:
Pressure, gas laws, ideal gas law, partial pressure Ch. 5
Midterm

Class 14:
Kinetic theory, deviation from ideal gas behavior Ch. 5

Class 15:
Enthalpy, calorimetry, enthalpy of formation, thermodynamics Ch. 6

Class 16:
Electromagnetic radiation, Bohr's Theory Ch. 7
Quiz 3

Class 17:
Introduction to quantum mechanics, quantum numbers Ch. 7

Class 18:
Electron configuration, the building-up principle Ch. 7

Class 19:
Periodic classification of the elements, periodic variation in physical properties Ch. 8

Class 20:
Atomic and ionic radius, ionization energy, electronic affinity Ch. 8

Class 21:
Covalent bonds, electro negativity Ch. 9
Quiz 4

Class 22:
Writing Lewis structures, formal charge, resonance, exceptions to the octec rule, bond strength Ch. 9

Class 23:
Molecular geometry, dipole moments, hybridization of atomic orbitals, double/triple bonds Ch. 10

Class 24:
Intermolecular forces, the liquid state, crystal structure, bonding in solids, phase changes and phase diagrams Ch. 12

Laboratory Schedule

Room: 105
Hour: 17:30 – 19:30

The lab reports have three parts, the pre-lab (to be completed on-line before the lab commences), the data and calculations and the post-lab. The pre-Lab Assignment due when you enter the lab. You and your partner will work collaboratively on the data and post-lab sections and hand in one report for the two of you.

In order to do a good job in the experiments, it is essential that you come well prepared.Reading the experiment for the first time in lab will put you and your partner at a disadvantage and make it very difficult to complete the experiment on time.

If you have any technical questions on the pre-lab, data section or post-lab assignments, you are encouraged to ask the instructor.

Safety Guidelines

All laboratory safety protocols in CHEM 11 will be strictly enforced. Violation of any safety protocol may result in point deduction on the Procedures, Techniques and Safety section of your individual Evaluation Sheet, and/or dismissal from the laboratory. Safety has two aspects: prevention of accident and response to emergency. The golden rule is to use your common sense. Treat your classmates and chemicals in the laboratory with respect. Do not work in the laboratory alone or perform unauthorized experiments. Ask your instructor whenever you do not know how to perform a procedure. Notify your instructor immediately when there is an accident (including broken glassware, major chemical spill, and bodily injury).

Laboratory topics

Experiment 1: Basic laboratory techniques
Objective: To learn the use of common, simple laboratory equipment.

Experiment 2: Identification of substances by physical properties
Objective: To become acquainted with procedures used in evaluating physical properties and the use of these properties in identifying substances.

Experiment 3: Separation of the components of a mixture
Objective: To become familiar with the methods of separating substances from one another using decantation, extraction, and sublimation techniques.

Experiment 4: Chemical reactions
Objective: To observe some typical chemical reactions, identify some of the products, and summarize the chemical changes in terms of balanced chemical equations.

Experiment 5: Reactions in Aqueous Solutions
Objective: To become familiar with writing equations for metathesis reactions, including net Ionic equations.

Attending Policy

Regular and prompt attendance is required. Under ordinary circumstances, you may miss two times without penalty. Each absence over this number will lower your course grade by a third of a letter and missing more than five classes may lead to a failing grade in the course. Arriving late and/or leaving before the end of the class period are equivalent to absences.

Policy on "Late Withdrawals"

In accordance with university policy, appeals for late withdrawal will be approved ONLY in case of medical emergency and similar crises.

Academic Honesty

Nanchang University expects all students to do their own work. Instructors will fail assignments that show evidence of plagiarism or other forms of cheating, and will also report the student's name to the University administration. A student reported to the University for cheating is placed on disciplinary probation; a student reported twice is suspended or expelled.

General Expectations:

Students are expected to:
— Attend all classes and be responsible for all materials covered in class and otherwise assigned;
— Complete the day's required reading and assignments before class;
— Review the previous day's notes before class and make notes about questions you have about the previous class or the day's reading;
— Participate in class discussions and complete required written work on time;
— Refrain from texting, phoning or engaging in computer activities unrelated to class during the class period;
— While class participation is welcome, even required, you are expected to refrain from private conversations during the class period.

Special Needs or Assistance

Please contact the Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material. Our goal is to help you learn, not to penalize you for issues which mask your learning.