

General Chemistry I Syllabus - Spring, 2017

CHEM 1100 B

Lecturer: Dr. Nick Thomas
Phone: (334) 244-3327.

Office: Room 310-I, Goodwyn Hall
E-mail: nthomas@aum.edu

Web site: www.getnickt.com site contains a copy of the syllabus & lecture notes. Test results will also be posted here. Click on links under CHEM1100. **Note:** instructor does not use Blackboard to post information.

Course Description: General Chemistry I (3). Pr., CHEM 1000, or ACT ≥ 17 and placement in Math 1100 or above, or departmental approval. A detailed study of atomic theory, chemical bonding, states of matter, solutions, acid-base theory.

Text: *General Chemistry: The Essential Concepts*, Raymond Chang, 7th Edition. A laboratory manual and safety goggles must be obtained by the students who are also enrolled for CHEM 1101 (lab course).

Course Objectives: 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.

Course Outline:

Chapter 1 Scientific method, measurement and the metric system, dimensional analysis, significant figures and laboratory calculations, overview of elements, compounds, physical and chemical change

Chapter 2 Structure of the atom, isotopes, periodic table, molecules and ions, nomenclature

Chapter 3 Atomic mass, % composition, moles, Avogadro's number, molar mass, determining empirical formulas, chemical reactions and chemical equations, limiting reagents and yields

Chapter 4 Aqueous solutions, precipitation reactions, acid base reactions, oxidation reactions, molarity, gravimetric analysis

Chapter 5 Pressure, gas laws, ideal gas law, partial pressure, kinetic theory, deviation from ideal gas behavior

Chapter 6 Enthalpy, calorimetry, enthalpy of formation, thermodynamics

Chapter 7 Electromagnetic radiation, Bohr's Theory, introduction to quantum mechanics, quantum numbers, Electron configuration, the building-up principle

Chapter 8 Periodic classification of the elements, periodic variation in physical properties, atomic and ionic radius, ionization energy, electronic affinity

Chapter 9 Covalent bonds, electronegativity, writing Lewis structures, formal charge, resonance, exceptions to the octet rule, bond strength

Chapter 10 Molecular geometry, dipole moments, hybridization of atomic orbitals, double/triple bonds

Chapter 12 Intermolecular forces, the liquid state, crystal structure, bonding in solids, phase changes and phase diagrams

Registration: Only students who are officially registered may attend class. Contact the registrar's office if you have any doubts concerning your registration status.

Attendance: Students have an obligation to attend all lectures and to be ON TIME. Lectures will begin promptly at 12:45 pm (period 4) on Tuesdays/Thursdays in room 319 Goodwyn Hall. Students are required to sign an attendance roll each day for the first few weeks.

Note: *1. Unless you have a pending emergency please switch off cellphone ringers whilst in class as they are very distracting to all.*

2. No cell phone or earphones may be used during exams; only non-programmable calculators

Assistance: Office hours will be posted on the instructor's office door and web site. Additional appointments may be made with the instructor. The Instructional Support Lab (203G) can also provide tutoring.

Special Needs: Students who require special attention should contact the AUM Center for Disability Services. *AUM attempts to make reasonable accommodations to meet the special needs of its disabled students.*

Grading: There will be 6 exams during the semester. The course grade will be based on the best FIVE of these exams (that is, one test may be dropped). Material to be tested in each exam is as follows (see timetable for dates):

1st exam: Chapters 1 and 2

4th exam: Chapters 5 and 6

2nd exam: Chapter 3

5th exam: Chapters 7 and 8

3rd exam: Chapter 4

6th exam: Chapters 9, 10 and 12

The 6th exam is held during finals week. Students will need a Scantron for each of the exams (do not bend as they may read incorrectly). Letter grades will be assigned as follows:

A = 90-100 % B = 80-89 % C = 65-79 % D = 50-64 % F < 50 %

Grades for each exam will be posted on the instructor's web page. On each exam, students must provide a code under which name the grades will be listed. The same code is to be used on all exams (so remember it!). The code must be a letter/single number/letter combination (e.g. A2B). Make up your own code, but do not to use the initials of your name.

Make-up exams: Individual make-up exams will **NOT** be given. If one exam is missed **FOR ANY REASON** it will automatically be the dropped exam (exception: official university activities, with written permission). If two exams are missed, a comprehensive make-up exam will be given during the final exam to replace the second missed exam.

Learning Outcomes: After completion of this course, students will be able to: Describe and use the scientific method; Use the periodic table; give the electronic configurations of elements; Use formulas and nomenclature; Know 3 basic types of chemical reactions (Acid-base, precipitation, redox); Work with enthalpy changes in reaction; Use moles and molarity; Understand the 3 states of matter; Work with the ideal gas law; Draw Lewis structures, describe molecular shapes.

Note: Significant home study is essential for any chemistry course. In addition to reading the text, it is recommended that you answer as many questions as you can from the end of each chapter in the text. As a bare minimum, at least tackle the problems highlighted in blue. Several practice tests are available on the website. Each contains 10-15 multiple choice questions typical of those you will encounter on actual exams for this course. Remember, these are just a sample of questions; the actual exams will be longer and contain questions on more course topics.