

QUEENSBOROUGH COMMUNITY COLLEGE
CHEMISTRY DEPARTMENT

COURSE SYLLABUS

CH-151: GENERAL CHEMISTRY I

Pre-requisites: MA-120 or Departmental permission

Hours: 3 Class Hours 3 Laboratory Hours 1 Recitation Hour **4 1/2 Credits**

Course Description: This course is the first part of general chemistry and is intended to provide students with a fundamental knowledge of the modern theory in general and inorganic chemistry. It covers many important topics, with emphasis on developing problem-solving skills as well as on concepts and theories. The course also covers topics that are essential background material to many disciplines in science and technology. These include: matter and energy; stoichiometry; gas laws; phase equilibrium; periodicity of elements; atomic and molecular structure; chemical bonding; molecular orbital theory; kinetic theory; states of matter and intermolecular forces; atomic spectra; properties of solutions; electrolytes; colligative properties; acid-base neutralization.

Curricula for which the course is required/recommended:

A.S. Degree Programs in Liberal Arts and Sciences (Science and Mathematics), Engineering Science, Health Sciences, and Environmental Health

General Education Objectives: Use analytical reasoning skills and apply logic to solve problems; use quantitative skills and mathematical reasoning to solve problems; integrate knowledge and skills in their major field and across disciplines; use information management skills effectively for academic research and lifelong learning.

Course Objectives/ Expected Student Learning Outcomes: Understand the important concepts and theories of chemical composition and bonding of matter in modern chemistry, and apply them to solve problems in chemistry, engineering and other disciplines; interpret and appreciate, both qualitatively and quantitatively, the properties of gases, liquids and solids at the molecular level; plan and perform experiments, gather and analyze data, draw conclusions, and communicate results to others orally and in scientific writing; use modern chemical instrumentation and computer technologies in chemical investigations; demonstrate familiarity with chemical literature.

Text: CHEMISTRY by Raymond Chang
9th Edition Package -- ISBN: 007-342-1855 (McGraw-Hill Publishers)

Package includes Student Solutions Manual, and access to Online Chem Skill Builder and Online Learning Center.

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Lab manual: Laboratory Experiments for General Chemistry, ISBN: 0-7575-0315-2
By P. Wong, P. Irigoyen, F. Rudo & P. Svoronos (Kendall/Hunt Publishing)

Methods by which student learning will be evaluated:

The general guidelines for assessing grades are as follows:

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|---|-----|
| ○ Examinations, Assignments and Classroom Performance | 50% |
| ○ Laboratory Work | 25% |
| ○ Final Examination | 25% |

The distribution may be changed at the discretion of the individual instructor. Aside from the above, the student is mandated to take the American Chemical Society (ACS) assessment test which will be administered during the last laboratory period (check-out, week 14). 10% of that grade will be added to the student's final course grade. The ACS exam can not lower the final course grade.

Accommodations for students with disabilities: Any student who feels that he/she may need an accommodation based upon the impact of a disability should contact the office of Services for Students with Disabilities in Science Building, room 132 (718-631-6257) to discuss his/her specific needs and to coordinate reasonable accommodations for documented disabilities. Students should also contact their instructor privately to discuss their specific needs.

Academic Integrity: Academic honesty is taken extremely seriously and is expected of all students. All assignments must be the original work of the student (and partners or group, if applicable). All questions or concerns regarding ethical conduct should be brought to the course instructor. "It is the official policy of the College that all acts or attempted acts that are violations of academic integrity be reported to the Office of Student Affairs (OSA). At the faculty member's discretion and with the concurrence of the student or students involved, some cases, though reported to the OSA, may be resolved within the confines of the course and department. The instructor has the authority to adjust the offender's grades as deemed appropriate, including assigning an F to the assignment or exercise or, in more serious cases, an F to the student for the entire course." (Taken from the QCC Academic Integrity Policy, 2/14/2005.)

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Attendance/Absence Policy

Attendance will be taken at every class. The Student Handbook states that you will be considered excessively absent from a course and will receive a WU grade if you have been absent for 15% or more of the total number of contact hours for your course. If there is a laboratory component to your course, you will be considered excessively absent if you miss 15% or more of **either component**. A WU is computed as an F in your GPA.

Students who have valid excuses for missed classes should speak with their instructor and present documentation explaining the reason for the absence.

- **If your class meets twice per week:** you will receive a grade of WU if you have a **total of 7 or more** excused and/or unexcused absences.
- **For any lecture that meets only once per week,** you will receive a grade of WU if you have a **total of 4 or more** excused and/or unexcused absences.

Laboratory Policy

You must earn a passing grade in the laboratory in order to pass the course. (A WU grade will be considered an F.) For every lab that meets only once per week, you will receive a grade of WU if you have a **total of 4 or more** excused and/or unexcused absences.

There are no make-up sessions for missed labs. Missed labs that are unexcused will be assigned a grade of zero. For excused absences, the lab average will be calculated from the experiments that you performed. Students who arrive to the lab after the pre-lab lecture will not be allowed to participate and will be considered absent. A full lab report is required for each of the experiments performed and is due the next class period. Late reports are not accepted unless it is due to an absence. The format of the report will be explained by the lab instructor during the first week of the course. Additional information will be distributed by the lab instructor.

Required attire: Students **MUST** wear safety goggles in the lab at all times. Failure to do so may lead to their expulsion from the lab. Sandals or open-shoes, untied long hair, and any type of food or beverage in the lab are forbidden.

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<u>CHAPTER</u>	<u>TOPIC</u>	<u>APPROX. HOURS</u>
1	Chemistry: the Study of Change	3
2	Atoms, Molecules, and Ions	4
3	Mass Relationships in Chemical Reactions	8
4	Reactions in Aqueous Solutions	6
5	Gases	5
7	Quantum Theory and the Electronic Structure of Atoms	5
8	Periodic Relationships Among the Elements	4
9	Chemical Bonding I: Basic Concepts	6
10	Chemical Bonding II: Molecular Geometry and Hybridization of Atomic Orbitals	6
11	Intermolecular Forces and Liquids and Solids	2
12	Physical Properties of Solutions	4
	Exams	3
	Total hours	56

The approximate hours per chapter are guidelines and are at the discretion of the instructor. The instructor is responsible for making assignments and scheduling examinations. The Final Exam date is scheduled by the Registrar.

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LABORATORY SCHEDULE

<u>WEEK</u>	<u>EXPERIMENT TITLE</u>	<u>EXPT. #</u>
1	Check-in; Lab Techniques; Safety Video	--
2	<u>Review</u> : Use of the Calculator, Significant Figures, Scientific Notation, Metric System and Units. <u>Expt</u> : Density of a Solution	1
3	<u>Quiz</u> : Significant Figures, Scientific Notation, Metric System and Units. <u>Expt</u> : Melting and Boiling Points	2
4	Formula weight of a compound	3
5	Composition of a Mixture	6
6	Preparation of an Alum	4
7	Introduction to Computer/Electrolytes	5 / 7
8	Reactions in Aqueous Solutions	10
9	Preparation and Standardization of a Sodium Hydroxide Solution	11
10	Molecular Weight of a Volatile Liquid	8
11	Equivalent Weight of a Metal	9
12	Beer-Lambert's Law and Spectrophotometry	13
13	Determination of a Molecular Weight by the Freezing Point Depression Method	12
14	ACS ASSESSMENT TEST AND CHECK-OUT	