



**CHEM 103**  
**General Chemistry II**  
**Winter 2011**

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**Course Description: CHE 103 General Chemistry II (3-3)A**

This course examines the laws of gases, acids and bases, equilibrium, electrochemistry and thermodynamics.

*Prerequisite: CHE 101*

**LECTURE AND LABORATORY INSTRUCTOR:** Dr. Ross Gilmore

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Moodle access : <http://moodle.ambrose.edu/course/index.php>

**LECTURE AND LAB SCHEDULE:**

**Lecture:**

Wednesday and Friday 1:00 pm —2:15 pm Room: A2145

**Lab:**

Monday 2:00 – 5:00 pm Room: A2145

**REQUIRED TEXTS:**

- I. *Chemistry: Human Activity, Chemical Reactivity* – Mahaffy et al, 1<sup>st</sup> Ed., Nelson Publishing
- II. *Laboratory Manual: Selected Laboratory Experiments II*. This manual is of Ambrose University issue and will be used as a guide and resource through the laboratory component of the course. Availability will be discussed during the first lecture.

**REQUIRED MATERIALS:**

Lab coat, lab notebook, lab glasses/goggles, scientific calculator.

**SUPPLEMENTARY MATERIALS:**

Your text is the same as that used by the University of Calgary for their equivalent course, Chemistry 203. Their website is:

<http://www.ucalgary.ca/chem/courses/chem203>

You may find links at this site to be very helpful.

### **RECOMMENDED TEXTS:**

*Math Review Toolkit* by Long and Long, or, any other math review booklet that is relevant to the sciences (especially chemistry and physics).

### **PRE-REQUISITES:**

Chemistry 101.

Mathematics 251 (Calculus I) is a suggested Co-requisite.

### **COURSE OVERVIEW:**

A continued analysis of the relationship between chemical structure and reactivity. Topics include using examples from inorganic and organic chemistry to investigate energetics, equilibria (e.g. acidity and basicity, quantitative and qualitative), and redox reactions.

General Chemistry II will move forward to examine the relationship of kinetics to equilibria, as well as equilibria in other systems. We will then explore reduction and oxidation chemistry and its application to the electrochemistry of voltaic cells and electrolytic cells. This will lead us into the study of voltaic cells and give us the opportunity to investigate the natural processes of corrosion.

The next major topic is thermochemistry. Within, we will focus on reaction enthalpies, free energies of reactions and their roles in reaction progress and reaction feasibility. Hopefully, in our final weeks, as a primer for 2<sup>nd</sup> year organic chemistry, we will begin to learn about some important organic molecules and their chemical properties.

### **COURSE OBJECTIVES:**

Upon completion of the course, students will have acquired the background knowledge required to move forward into higher level organic and inorganic chemistry courses. Students should leave the course with a firm yet broad foundation for further chemical studies.

To succeed in chemistry students are advised to read relevant topics in their text the day before or morning of their lectures. An experienced student will also review their notes within several hours of the lecture to shift acquired knowledge from short to long-term memory. In addition, since chemistry involves problem solving, students must practice these skills by completing the questions at the end of each chapter.

Dry Lab and Wet Lab attendance is mandatory and questions assigned during labs must be attempted prior to entry. They may be completed during the session. There is a clear correlation between participation and success in this course. Your study time is limited. Use these tutorial and experimental sessions wisely.

**EVALUATION:**

Dry Lab Assignments and 4 Quizzes	6%
Midterm Exam #1	10%
Midterm Exam II	15%
Wet Laboratory	30%
Final Exam	39%

\*Note: A passing level of performance in the laboratory is a requirement for completion of the course. Your grade in the lab is at the discretion of your lab instructor.

To pass the lecture component of the course a student must attain a minimum of 50%. To move on to courses for which this course is a pre-requisite, a C-grade (64%) is required.

**LETTER GRADE GUIDELINE**

<b>Percentage (%)</b>	<b>Grade</b>	<b>Grade Point</b>
86-100	A	4.0
80-85	A-	3.7
78-79	B+	3.3
74-77	B	3.0
70-73	B-	2.7
68-69	C+	2.5
64-67	C	2.0
60-63	C-	1.7
56-60	D+	1.5
50-55	D	1.0
0-49	F	0

## TENTATIVE LECTURE SCHEDULE:

Week Starting	Text Sections	Lecture Topics	Lab Topics
Jan 10th	Chapter 14	Equilibria: constants, hetero/homogeneous, expressions	<b>no labs this week</b>
Jan 17th	Chapter 14	Kinetics and their relationship to equilibria, concentration predictions,	<b>No labs</b>
Jan 24th	Ch: 14	Le Chatelier's Principle, catalysis effects on equilibrium. <b>Community day Jan 27th</b>	Experiment 1
Jan 31	Ch :15	Acids/Bases: Arrhenius, Bronsted-Lowry, and Lewis definitions,	Dry Lab 1, Quiz 1
Feb 7	Ch 15/16	pH scale. Strong/vs. weak, % ionisation and relationship to $K_a$ and $K_b$	Experiment 2
Feb 14th	Ch: 16	Structure effects on acidity, acid/base prop's of salts, Buffers. Titrations. <b>1<sup>st</sup> Mid-term Wednesday the 16<sup>th</sup> of February</b>	Dry Lab 2, Quiz 2
Feb 21		<b>Reading Week, College Closed February 22nd to 25th</b>	<b>no labs</b>
Feb 28	Ch 12, 15, 16, 17	Solubility: and equilib., and common ion effect, and $K_{sp}$ , and pH, and complex ions.	Experiment 3
March 7th	Ch: 5, Ch: 19	Balancing redox rxn's, voltaic cells, emf's, std reduction potentials, rxn spontaneity.	Dry Lab 3, Quiz 3
Mar 14	Ch 19	Equilib. constants from emf's. Nernst equation, corrosion, electrolysis. <b>2nd midterm, in class Wednesday March 16th.</b>	Experiment 4
Mar 21	Ch: 16 Ch: 18	Thermochemistry: energy forms, heats of reaction, enthalpy, thermo equations, Stoichiometry for heats of reactions, calorimetry & Hess's law.	Experiment 5
Mar 28	Ch: 18	Laws of thermo, entropy, enthalpy, Gibbs Free energy	Dry Lab 4, Quiz 4
Apr 4	Ch: 18	Equilib., and free energy, free energy and temp dependence. Living systems and thermodynamics.	Experiment 6 and checkout
Apr 11	Ch: 22	Organic Chemistry Intro: Alkanes, cycloalkanes, alkenes, alkynes, Aromatic hydrocarbons, steroids and other biomolecules	
Apr 18		<b>April 14<sup>th</sup> is the last day of classes April 18<sup>th</sup> to 29<sup>th</sup> is the final exam period</b>	

**LAB SAFETY:**

Lab coats and goggles are mandatory. You **must** abide by the regulations outlined in your lab manual. Proper handling and disposal of chemicals is important to protect both the environment and your fellow students. Every chemical used in the laboratory comes with a WHMIS sheet. If uncertain regarding risks, ask your lab instructor, and/or refer to the WHMIS information sheet. Be familiar with all safety equipment and emergency exits within the lab. Hair should be tied back, no open shoes/sandals, avoid wearing contact lenses. Always be attentive and anticipate the risks associated with the lab procedure in progress.

**Instructors Policy Statement on Lab Attendance:** “Because of the incremental nature of knowledge, missed laboratory sessions may create a hazardous situation. Students who are judged to have missed an acceptable number of laboratory sessions in a course will be required to withdraw from that course. Depending on specific content, a single missed session may be judged as unacceptable.”

**Academic Policies:**

Attendance at lectures and labs is mandatory.

**Instructor’s Attendance Policy:**

Students are expected to attend all classes and laboratories. Unexcused absence may result in loss of marks or in additional assignments being required. Absence from class not satisfactorily validated by the course instructor may lead to a penalty on the final grade. When possible, students should advise their instructor of anticipated absence from class.

A student may be denied permission to write the final examination on the recommendation of the instructor pending approval of the Deans Council. Grounds for such debarment are: failure to complete a substantial part of the written assignments for a course; frequent absence from class; or failure to complete a sufficient amount of the required practical or laboratory work in a course.

**Institutional Policies:**

It is the responsibility of all students to become familiar with and adhere to academic policies as stated in the Student Handbook and Academic Calendar. Personal information, that is information about an individual that may be used to identify that individual, may be collected as a requirement as part of taking this class. Any information collected will only be used and disclosed for the purpose for which the collection was intended. For further information contact the Privacy Compliance Officer at [privacy@ambrose.edu](mailto:privacy@ambrose.edu).

Although extensions to coursework in the semester are at the discretion of the instructor, students may not turn in coursework for evaluation after the last day of the scheduled final examination period unless they have received permission for a “Course Extension” from the Registrar’s Office. Requests for course extensions or alternative examination time must be submitted to the Registrar’s Office by the appropriate deadline (as listed in the Academic Calendar <http://www.ambrose.edu/publications/academiccalendar>). Course extensions are only granted for serious issues that arise “due to circumstances beyond the student’s control.”

We are committed to fostering personal integrity and will not overlook breaches of integrity such as plagiarism and cheating. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from the university college. Students are expected to be familiar with the policies in the current Academic Calendar and the Student Handbook that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean.

Students are advised to retain this syllabus for their records.

Course changes, including adding or dropping a course, may be made during the Registration Revision period, as outlined in the Calendar of Events. All course changes must be recorded on a Registration form, available from the Office of the Registrar. Due to circumstances such as class size, prerequisites or academic policy, the submission of a Registration form does not guarantee that a course will be added or removed from a student's registration. Students may change the designation of any class from credit to audit up to the date specified in the Calendar of Events, although students are not entitled to a tuition adjustment or refund after the Registration Revision period.

Withdrawal from courses after the Registration Revision period will not be eligible for tuition refund. Students intending to withdraw from some or all of their courses must submit a completed Registration form to the Registrar's office. The dates by which students may voluntarily withdraw from a course without penalty are listed in the Calendar of Events. A grade of 'W' will be recorded on the student's transcript for any withdrawals from courses made after the end of the Registration Revision period and before the Withdrawal Deadline (also listed in the Calendar of Events). 'W' grades are not included in grade point average calculations. A limit on the number of courses from which Academic a student is permitted to withdraw may be imposed. Students wishing to withdraw from a course, but who fail to do so by the applicable date, will receive the grade earned in accordance with the course syllabus. A student obliged to withdraw from a course after the Withdrawal Deadline because of health or other reasons may apply to the Registrar for special consideration.

An appeal for change of grade on any course work must be made to the course instructor within one week of receiving notification of the grade. An appeal for change of final grade must be submitted to the Office of the Registrar in writing within 30 days of receiving notification of the final grade, providing the basis for appeal. A review fee of \$50.00 must accompany the appeal to review final grades. If the appeal is sustained, the fee will be refunded.

Academic dishonesty is taken seriously at Ambrose University College as it undermines our academic standards and affects the integrity of each member of our learning community. Any attempt to obtain credit for academic work through fraudulent, deceptive, or dishonest means is academic dishonesty. Plagiarism involves presenting someone else's ideas, words, or work as one's own. Plagiarism is fraud and theft, but plagiarism can also occur by accident when a student fails or forgets to give credit to another person's ideas or words. Plagiarism and cheating can result in a failing grade for an assignment, for the course, or immediate dismissal from Ambrose. Students are expected to be familiar with the policy statements in the current academic calendar and the student handbook that deal with plagiarism, cheating, and the penalties and procedures for dealing with these matters. All cases of academic dishonesty are reported to the Academic Dean and become part of the student's permanent record.