

**Chemistry 111- Fall 2013**  
**General Chemistry I Syllabus**  
**SUNY Oneonta**

SECTION 4, CRN 127

Lecture HCUN RDTH, MWF 12:00 – 12:50 PM

**Instructor Contact Information**

Dr. Maurice Odago

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Office Hours: T 10:00AM-12:00 PM

This course is the first part of general chemistry course intended for science and non-science majors. The course covers the topics of atomic and molecular structure, chemical reactions and physical properties of matter.

**TEXTBOOK AND OTHER COURSE MATERIAL**

- Textbook: William J. Vining, Susan M. Young, Roberta Day and Beatrice Botch (2014), OWL Book for General Chemistry, Preliminary Edition: with Owl access code.
- Laboratory Manual (available at the bookstore)
- Hayden-McNeil Student Lab Notebook (with carbonless copies)
- Owl access code (should come with the textbook)
- Laboratory Safety Goggles
- Scientific Calculator

**Course Webpage**

Course materials such as course schedule, PowerPoint downloads, lectures, and laboratory experiment downloads are found on the course webpage: <http://employees.oneonta.edu/odagomo/>

**The physical textbook is available at the campus bookstore or you may get an electronic copy at:** Follow the instructions below for your OWL registration

**OWL REGISTRATION AND LOGIN DIRECTIONS**

1. Go to:

<https://c-owl.umass.edu/owl->

[c/register/owlmgr.cgi?Mode=2&ArchivedDatabaseID=27&CategoryID=39](https://c-owl.umass.edu/owl-c/register/owlmgr.cgi?Mode=2&ArchivedDatabaseID=27&CategoryID=39)

Alternate path:

Go to: <https://c-owl.umass.edu>

Choose: OWLBook

Choose: OWLBook for General Chemistry, First Edition

Choose: SUNY Oneonta – Oneonta, New York

2. Choose Student Registration

3. Choose your section in the course Chemistry 111 – SUNY Oneonta 2013

4. Fill out form. NOTES:  
Telephone number is not necessary.  
Check: Use 240-day free trial

If you are repeating the course you might need to make up a new, different login.

5. To log in, go to:  
<https://c-owl.umass.edu/owl-c/user/loginpage.cgi?Server=owl-sunyoneontaowlbook1e&UserType=Student>

Alternate path:

- Go to: <https://c-owl.umass.edu>  
Choose: OWLBook  
Choose: OWLBook for General Chemistry, First Edition  
Choose: SUNY Oneonta – Oneonta, New York

### **OWL HOMEWORK**

Homework will use the OWL system served by the University of Massachusetts. The system is “mastery” based, meaning that you can work on an assignment as long as you want and try questions as many times as you want, until succeeding. There is no penalty for getting an answer wrong. There is only a penalty for not eventually getting it right.

The login address is:

Your login is SUCO + your email address up to the @ sign. So, mine is **SUCOodagomo**.

Your password is your **A00** student number, including the A.

Assignments will be made weekly and will be due at midnight on Sunday.

### **SUNY GENERAL EDUCATION OUTCOMES FOR NATURAL SCIENCES**

Students will demonstrate:

- Understanding of the methods scientists use to explore natural phenomena, including observation, hypothesis development, measurement and data collection, experimentation, evaluation of evidence, and employment of mathematical analysis; and
- Application of scientific data, concepts, and models in one of the natural sciences.

### **STUDENT LEARNING OUTCOME OBJECTIVES**

- Students will demonstrate an understanding of elements, compounds, and mixtures their properties, reactions.
- Students will demonstrate an understanding the interaction of matter with energy, and how this affects bonding properties.
- Students should be able to relate observable macroscopic properties are microscopic to interactions and/or changes at the molecular or atomic levels.
- Students should be able to apply the metric system in quantitative applications of chemistry
- Students should be able to communicate (read and write) using chemical symbols, equations

## **COURSE REQUIREMENTS**

Students are required to attend all scheduled lectures and laboratory experiments, complete all the assigned OWL homework, quizzes, exams and labs in order to meet the evaluation criteria of the course

## **COURSE ACTIVITIES/ TEACHING STRATEGIES**

The course will involve activities such as lecture, demonstrations, laboratory experiments, discussions, reviews, office hours and online homework. Students are expected to participate in all the activities of the course to qualify for a final grade in the course.

## **LATE ASIGNMENTS & MAKE\_UP TEST POLICY**

There will be NO make-ups for exams, quizzes and labs. Any missed exams, quizzes or labs will result to a zero grade for the respective activity. Exceptions may be possible for conflicting pre-planned sporting activities and/or in extraordinary circumstances

## **METHOD OF EVALUATION**

3 Hour Exams, 100 points each	= 300 points
Comprehensive Final Exam	= 200 points
OWL Homework	= 100 points
Laboratory	= 100 points
Quizzes	=100 points

### **Letter grade ranges on a percentage basis are:**

<b>A</b>	90.0 – 100%	<b>C-</b>	67.0 – 69.9%
<b>A-</b>	87.0 – 89.9%	<b>D+</b>	64.0 – 66.9%
<b>B+</b>	84.0 – 86.9%	<b>D</b>	60.0 – 63.9%
<b>B</b>	80.0 – 83.9%	<b>D-</b>	57.0 – 59.9%
<b>B-</b>	77.0 – 79.9%	<b>E</b>	Below 57%
<b>C+</b>	74.0 – 76.9%		
<b>C</b>	70.0 – 73.9%		

**COURSE OUTLINE:** The course will cover the following topics in the order listed.

Chapter 1: Matter on the Atomic Scale

Chapter 2: Elements and Compounds

Chapter 3: Stoichiometry (most of this chapter will be covered in the lab)

### **Exam 1: September 18, 2013**

Chapter 4: Chemical Reactions and Solution Stoichiometry

Chapter 6: Electromagnetic Radiation and the Electronic Structure of the Atom

Chapter 7: Electron Configurations and the Properties of Atoms

### **Exam 2: October 23, 2013**

Chapter 8: Covalent Bonding and Molecular Structure

Chapter 9: Theories of Chemical Bonding

Chapter 11: Intermolecular Forces and the Liquid State

**Exam 3: November 20, 2013**

Chapter 13: Liquids and Solutions (Colligative Properties)

**A Comprehensive Final Exam: Monday December 16, 2013** at 11:00AM-1: 30PM in HCUN  
RDTH

### COURSE SCHEDULE

Week	M	W	F
Aug 26-30	Obtain course materials and get ready for classes	Introduction and a quick beginning; C1: What is Chemistry	Classification of Matter; on the atomic scale, pure substances macroscopic scale and mixtures
Sep 2-6	C1: Scientific units, scientific notation, metric system Significant figures, calculations, precision and accuracy	C1: Dimensional analysis, density conversions	C2: Elements and Compounds Atomic structure, periodic table
Sep 9-13	C2: Covalent compounds, molecular and empirical formulas, molecular models, naming	C2: Monoatomic and polyatomic ions, ionic compounds, naming	C2: Covalent vs. ionic compounds, review
Sep 16-20	C3: Stoichiometry; Avogadro's Number, molar mass, compound formulas (rest of C3 covered in lab)	<b>Exam 1: C1, C2, C3.1</b>	C4: Types of chemical reactions: combination, decomposition, displacement
Sep 23-27	C4: Compounds in aqueous solutions, ionic compound aqueous solubility, precipitation reactions	C4: Net ionic equations (NIE)	C4: Acid-base reactions, gas-forming reactions, oxidation and reduction, oxidation numbers and oxidation states
Sep 30-Oct 4	C4: recognizing redox reactions, concentration and molarity	C4: Preparing solutions of known concentration, solution stoichiometry	C4: Titrations

<b>Oct 7-11</b>	C6: Electromagnetic radiation: wavelength, frequency, spectrum; photoelectric effect, atomic line spectra, Bohr model, wave properties of matter	C6: Wave functions, quantum theory of atomic structure, quantum numbers, orbital shapes, nodes, orbital energy diagrams and changes in electronic state	C7: Electron Configurations and the properties of atoms; Electron spin and $m_s$ , types of magnetic materials, orbital energies, Pauli exclusion principle, electron configurations
<b>Oct 14-18</b>	C7: Electron configurations, cont., trends in orbital energies, atomic size, ionization energy, electron affinity		
<b>Oct 21-25</b>	C7: Formation and electron configuration of ions, cations, anions, ion size	<b>Exam 2: C4, C6, C7</b>	C8: Covalent bonding, Coulomb's Law, Lewis symbols and structures. Octet rule and exceptions, resonance structures
<b>Oct 28- Nov 1</b>	C8: Covalent bonding; Bond order, length, and energy; resonance, exception to the octet rule, bond energy and reaction enthalpy	C8: Lewis structures, Formal charge, bond polarity, resonance, electronegativity	C8: VSEPR and electron-pair geometry, molecular geometry, molecular polarity
<b>Nov 4-8</b>	C9: Valence bond theory, hybrid orbitals, Pi Bonding 9.3a-9.3d (omit 9.4)	C11: Kinetic molecular theory, changes, enthalpy of vaporization intermolecular forces (IMF), phase	C11: Dynamic equilibrium and vapor pressure, effect of temperature and IMF on vapor pressure, boiling point
<b>Nov 11-15</b>	C11: Vapor pressure and temperature relationship, surface tension, viscosity, capillary action	C12.5: Phase diagrams, phase changes involving solids	C11: Dipole-dipole IMF, Dipole-induced dipole IMF, induced dipole-induced dipole IMF

Nov 18-22	C11: Effect of polarizability and hydrogen bonding on physical properties, comparison of IMF	<b>Exam 3: C8, C9, C11</b>	C13: Solubility review, concentration units, entropic and thermodynamic control of chemical processes, gas-gas mixtures
Nov 25-29	Thanksgiving Break		
Dec 2-6	C13: Liquid-liquid mixtures, solid-liquid mixtures, temperature and pressure effects on solubility	C13: Colligative properties, osmotic pressure, vapor pressure depression	C13: boiling point elevation and freezing point (melting point) depression
Dec 9-13	C13: alloys, colloids	Problem solving for C11 and C13	Overall Semester Review
Dec 16-20	<b>Cumulative Final Exam 11:00-1:30</b>		

### LABORATORY:

Laboratory work is an integral and essential part of this course, and will represent a significant factor in the final course grade, as noted above. Each student is expected to attend every laboratory section meeting that is scheduled. Any student who is forced by circumstances beyond his/her control to miss one of the labs should consult the instructor. **Students may not work in the laboratory without direct faculty supervision.**

Each student will keep a laboratory notebook. This notebook will include a table of contents, a brief rationale for each experiment, all procedural steps, data and observations, and instructor feedback. Carbon copies from these notebooks will be collected periodically for assessment. Unless students are informed otherwise, written laboratory reports will be due at the first lab meeting after completion of each experiment. The lowest lab score will be dropped. No lab report will be accepted late or after December 7, 2012 for any reason.

Unless announced in advance, **safety goggles are required to be worn over the eyes in the laboratory. Students are required to provide their own safety goggles.** Open-toed shoes, unrestrained long hair, excessively loose clothing and other items, which may be easily ignited or snagged on apparatus, are not permitted in the laboratory.

Food, drink, candy, cosmetics, and tobacco products are not allowed in the laboratory. Portable music players, cellular telephones, and other electronic devices (such as personal laptop computers) must be turned off and stored away from the laboratory work area.

**Department of Chemistry and Biochemistry**  
**Policy on Course Attendance, Performance, Participation and Behavior**

1. Students are expected to attend all scheduled course sessions and should be prepared by reading in advance any relevant material assigned or provided. Participation (defined by interacting with the instructor, working problems at the board, individually or in groups, using personal response “Clicker” systems and other mechanisms defined in the syllabus) is expected.
2. Students are reminded that instructors are not required to accept assignments submitted late, except in instances allowed according to College policies. College Policies as defined in the Student Code of Conduct apply to lecture, recitation and laboratory portions of all courses.
3. Laboratories are an integral part of education in chemistry courses. As a result, participation in all laboratories scheduled for a course is expected. Unless alternate activities are scheduled, students can expect that their laboratory section will meet each week, and failure to attend laboratories may lead to failure in the course.
4. The minimum acceptable grade for a chemistry course prerequisite is a C-. For example, a student with a D+ in General Chemistry I may not enroll in General Chemistry II. This standard applies to all Chemistry prerequisites for all Chemistry courses.
5. **The laboratory for a course must be passed**, normally by earning 60% of the available score or points for the laboratory, in order to pass the course. Exceptions may be noted in syllabus.
6. Students are expected to bring to laboratory the laboratory manual (or printout of the experiment), a laboratory notebook (if required), a calculator, ruler or other materials as specified by the instructor or in the syllabus.
7. Students are not allowed to work in the laboratory without direct faculty supervision.
8. Unless announced in advance, **SAFETY GOGGLES (WHICH PROVIDE A COMPLETE SEAL AROUND THE EYES AND ARE EQUIPPED WITH INDIRECT VENTS) ARE REQUIRED TO BE WORN AT ALL TIMES IN THE LABORATORY. STUDENTS ARE REQUIRED TO PROVIDE THEIR OWN SAFETY GOGGLES.**
9. Open-toed shoes (e.g. sandals, “Birkenstocks”, flip-flops, etc), unrestrained long hair, excessively loose clothing and other items, which may be easily ignited or snag on apparatus are not allowed.
10. Food, drink, candy, cosmetics, tobacco products, etc. are not allowed in the laboratory.
11. Students are expected to be attentive to the material and any experiments and apparatus in the laboratory. The following must be turned off and stored away from the laboratory bench while in laboratories:
  - Portable music players (e.g. iPods, MP3 players and the like)
  - Cellular telephones, pagers, text messaging devices and the like
  - Other portable electronic devices as defined by the laboratory instructor
12. Horseplay, practical jokes, “goofing around” or interfering with other students’ work is not allowed in the laboratory.

13. Students should not expect to be able to makeup missed laboratory sessions or experiments. If a makeup session is possible, it will be at the discretion of the laboratory instructor and will normally be during the same week as the missed laboratory section.
14. Students will not be permitted to work in any laboratory section other than that they are registered for unless they have the **written approval** of both their regular instructor AND the instructor in the section they wish to enter.

Course instructors may modify these guidelines as necessary to meet the requirements of individual courses or chemical specialties in consultation with the Department Chairperson. Students should expect to receive a copy of these guidelines in their course syllabus or be given a copy by the course instructor (either in paper form or by electronic mail).

### **Laboratory safety**

All students are required to complete the laboratory safety test and obtain a perfect score before allowed to perform any experiments in the lab. Your instructors will administer the test and more information will be provided in lab.

### **ATTENDANCE POLICY**

Attendance in lectures is required. There are 41 class meetings throughout the semester. Each student is given 10 free misses, for any reason. Each miss beyond those 10 will deduct 2 points (out of 700) from the final point total. *Absences may be excused for distant sports events, medical issues or family emergencies if – and **only** if – appropriate documentation is offered.*

### **ADA (AMERICAN WITH DISABILITIES ACT) STATEMENT**

Students Diagnosed with a Disability—All individuals who are diagnosed with a disability are protected under the Americans with Disabilities Act, and Section 504 of the Rehabilitation Act of 1973. As such, you may be entitled to certain accommodations within this class. If you are diagnosed with a disability, please make an appointment to meet with Student Disability Services (SDS), 209 Alumni Hall, ext. 2137. All students with the necessary supporting documentation will be provided appropriate accommodations as determined by the SDS Office. It is entirely your responsibility to contact SDS and concurrently supply me with your accommodation plan, which will inform me exactly what accommodations you are entitled to. You will only receive accommodations once you provide me with an SDS accommodation plan. Any previously recorded grades will not be changed.

### **Emergency Evacuation/Shelter-in-Place Procedures**

In the event of an emergency evacuation (i.e., fire or other emergency), our laboratory classes meeting in the physical sciences building are directed to reassemble at the Chase Gymnasium so that all persons can be accounted for. Evacuation from our lecture hall in HCUN RDTH is to the Fine Arts Theater. Complete details of the emergency evacuation, shelter-in-place, and other emergency procedures can be found at <http://www.oneonta.edu/security>.