

Division/School Approval:	<u>3/6/15</u>	<u>[Signature]</u>
	Date	Initial
Curriculum Committee Approval:	<u>3/13/15</u>	<u>[Signature]</u>
	Date	Initial
Faculty Approval:	<u>3/27/15</u>	<u>[Signature]</u>
	Date	Initial

SCHENECTADY COUNTY COMMUNITY COLLEGE
Course Outline

ACADEMIC DIVISION/SCHOOL: Mathematics, Science, Technology and Health

PREPARED BY: Tammy Gummersheimer

COURSE CODE: CHM 121 **COURSE TITLE:** General Chemistry I

LECTURE HOURS/WEEK: 3 **LAB HOURS/WEEK:** 3 **CREDIT HOURS:** 4

PREREQUISITE/S:

PREREQUISITE or CONCURRENT COURSE: MAT 118 or MAT 148 or MAT 154 or eligible to enroll in MAT 167

COREQUISITES:

FINAL EXAM REQUIRED: YES X NO

COURSE DESCRIPTION: This course is the first semester of a two-semester sequence. Topics include Modern Atomic Theory, chemical bonding, classification of chemical reactions, stoichiometry, solution chemistry, the gas laws, and enthalpy. The laboratory experiments emphasize techniques, laboratory notebook keeping and illustrate the concepts studied in lecture. Prior course work in chemistry is required.

SCCC Core Principle Course	yes
SUNY General Education Course	yes

STUDENT LEARNING OUTCOMES:

Students successfully completing this course will:

- Apply Modern Atomic Theory and Quantum Theory to electron configurations and analyze the periodic properties of the elements;
- Apply Valence Bond Theory and Hybridization Theory to simple covalent systems;
- Identify particles in solution, predict products, and balance equations for various types of aqueous chemical reactions;
- Utilize stoichiometry to determine quantities in chemical reactions;
- Apply the Ideal Gas Law and enthalpy concepts to solve various problems; and
- Record and analyze quantitative data and qualitative observations from experimental work.

REPRESENTATIVE TEXT/S:

Gilbert, T., Kirss, R., Foster, N. *Chemistry*. New York, NY: W.W. Norton Publishers. (Current edition)

SUPPLEMENTARY MATERIALS/REFERENCES:

SCCC Laboratory Manual.

Shakhashiri, B., Schreiner, R. *Workbook for General Chemistry*. Champaign, IL: Stipes Publishers. (Current edition)

EVALUATION METHODS:

Evaluation methods will include examinations and the laboratory notebook. Other evaluation methods may include, but are not limited to, quizzes, worksheets, or homework. Evaluation methods utilized in lecture weight as 75% and evaluation methods utilized in the laboratory weight as 25%.

NOTE: Grading and assessment criteria may appropriately differ. Grades focus on what individual students have learned while assessments focus on entire cohorts of students. Each instructor will determine his/her grading criteria for the course and state on the course syllabus.

REQUIRED ASSESSMENT METHODS:

Assessment results from these methods will be used for course-level assessment and, where applicable, for SCCC core principles and SUNY General Education Knowledge and Skills areas. This information will be incorporated in program reviews.

Student Learning Outcome	Method(s)
Apply Modern Atomic Theory and Quantum Theory to electron configurations and analyze the periodic properties of the elements	Exam questions
Apply Valence Bond Theory and Hybridization Theory to simple covalent systems	Exam questions
Identify particles in solution, predict products, and balance equations for various types of aqueous chemical reactions	Exam questions
Utilize stoichiometry to determine quantities in chemical reactions	Exam questions
Apply the Ideal Gas Law and enthalpy concepts to solve various problems	Exam questions
Record and analyze quantitative data and qualitative observations from experimental work	Lab Practical

NOTE: College policy requires a final exam or final week activity.

COURSE CONTENT OUTLINE:

COURSE: CHM 121 – General Chemistry I

<u>WEEK</u>	<u>TOPIC</u>
1	Matter and Measurement
2	Introduction to Atoms, Ions, and Compounds
3-4	The Mole and Chemical Reactions
5-6	Molarity, Acid-Base Reactions, and Precipitation Reactions
7	Redox Reactions
8	Thermochemistry (Enthalpy)
9-11	The Quantum Mechanical Atom and Periodic Properties
12-13	Covalent Bonds, Lewis Structures, Molecular Geometry, and Molecular Polarity
14-15	Properties of Gases
16	Cumulative Final Exam

The topics must be covered in this order to properly coordinate with the laboratory.

COURSE LABORATORY OUTLINE:

COURSE: CHM 121 – General Chemistry I

<u>WEEK</u>	<u>TOPIC</u>
1	Lab Check-in, Safety, and the Laboratory Notebook
2	Analysis of Graphs and Tables and Graphing Techniques
3	Laboratory Techniques and Measuring Instruments
4	Determining the Concentration of an Unknown Solution
5	Stoichiometry of a Compound
6	Determining the Molar Mass of an Unknown Acid
7	Hess' Law
8	Atomic Spectroscopy
9	Chemical Changes of Copper: A Complete Cycle
10-11	Lab Practical
12	Molecular Geometry
13	Relationship between Volume and Temperature of a Gas
14	Instructor's Choice and Check-out