SOUTHEAST COMMUNITY COLLEGE
DIVISION OF ARTS AND SCIENCES
Sciences
Revision Date: 07-01-25

I. CATALOG DESCRIPTION

Course Number:	CHEM1090
Course Title:	General Chemistry I
Prerequisite(s):	Intermediate Algebra or Appropriate College Level Math Score or Higher
Catalog Description:	This is the first course of a comprehensive chemistry sequence. Topics include nomenclature, atomic structure, chemical reactions, essentials of bonding, periodic properties, Valence Shell Electron Pair Repulsion Theory (VSEPR), modern bonding theories, stoichiometry, thermochemistry, and the chemistry of solids, liquids, gases.
Credit Hours:	4.0
Class Hours:	45.0
Lab Hours:	30.0
Total Contact Hours:	75.0

II. COURSE OBJECTIVES: *Course will:*

A. Implement basic dimensional analysis.
B. Introduce basic structure of the atom.
C. Disseminate the properties of elements.
D. Describe the quantum-mechanical model of the atom.
E. Identify the properties of molecular shapes.
F. Identify inorganic compounds using correct nomenclature.
G. Describe chemical reactions by symbolic, numeric, and verbal means.
H. Introduce simple reactions.
I. Elaborate on energy transfer and basic thermodynamic relationships.
J. Delineate stoichiometric relationships.
K. Convey properties of gases and gas laws.
L. Introduce the principles of solutions and their concentrations.
M. Familiarize the student with the properties of acids and bases.
N. Delineate safe and appropriate laboratory techniques.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES

A. Student Learning Outcomes: *Student will be able to:*

A. Calculate one quantity from another by use of dimensional analysis.
B. Explain periodic trends using the structure of an atom.
C. Describe the changes as energy interacts with an atom.
D. Compare and contrast covalent and ionic bonding.
E. Draw Lewis structures for atoms, ions, and molecules and use Lewis structures to determine the shape of a molecule.
F. Determine correct International Union of Pure and Applied Chemistry (IUPAC) names and chemical formulas of compounds.
G. Describe and predict products of precipitation, acid-base, and redox reactions by symbolic, numeric, and verbal means.
H. Perform enthalpy calculations and interpret energy diagrams.
I. Perform stoichiometric calculations.
J. Perform gas law calculations.
K. Calculate solution concentrations.

L. Demonstrate the ability to perform lab experiments safely, to interpret the data collected, and to draw reasonable conclusions based on the data.

B. General Education Learning Outcomes

1. GELO #5: Analytical, Quantitative, and Scientific Reasoning

Outcome: Apply mathematical and scientific methods to solve problems from an array of contexts and everyday situations.

Outcome: Effectively develop strategies, algorithms, or experiments (or performing experiments) to better describe the systems or to solve the problems.

Outcome: Manipulate formulas, data sets, graphs, tables, etc. in a way to produce a meaningful outcome.

IV. CONTENT/TOPICAL OUTLINE (*Course outline may provide more detailed information*)

A. Matter and measurement
B. Atomic theory and the periodic table
C. Atoms, molecules, and ions
D. Chemical reactions
E. Mass, moles, and stoichiometric relationships
F. Gases and gas laws
G. Thermochemistry
H. Quantum theory of the atom
I. Electron configurations and periodicity
J. Chemical bonding
K. Molecular geometry and bonding theories
L. States of matter

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):

1. Paperback:
ISBN 978-1-59399-579-9
Chemistry 2e, Flowers, Paul, et al, OpenStax, 2019.

Hardback:
ISBN 978-1-94717-264-7
Chemistry 2e, Flowers, Paul, et al, OpenStax, 2019.

Free Online version:
https://openstax.org/details/books/chemistry-2e

Free ebook download:
https://openstax.org/details/books/chemistry-2e

The required AKTIV homework:
https://aktiv.com/

B. Other Resources:

1. Redniss, Lauren. *Radioactive: Marie & Pierre Curie: A Tale of Love and Fallout*. 1st Edition, It Books, 2010. ISBN: 978-0061351327.

2. TI-30XIIS Scientific Calculator (optional, recommended)

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:

1. Lecture
2. Discussion
3. Demonstration
4. Group activity
5. Application
6. On-Line
7. Distance education
8. Laboratory activities

VII. METHODS OF EVALUATION

A. Methods of evaluation typically include a combination of the following:

1. Participation
2. Assignments
3. Exams
4. Projects
5. Papers
6. Lab work
7. Instructors will distribute and discuss evaluation and his/her grading policies with students at the beginning of each term.

B. SCC GRADING SCALE

A+	95-100	C+	75-79	F	59 or less
A	90-94	C	70-74		
B+	85-89	D+	65-69		
B	80-84	D	60-64		