Faculty members are required to have the outline submitted to the Academic Affairs Office. The course outline is the form used for approval of new courses by the Academic Affairs and Standards Council.

DEPT. CHEM  COURSE NUMBER: 1150

NUMBER OF CREDITS: 4  Lecture: 3  Lab: 1

Course Title:
Survey of Chemistry

Catalog Description:
Survey of Chemistry introduces key concepts of general, organic, and biological chemistry including measurement, matter, nomenclature, chemical quantities, chemical reactions, solutions, acids and bases, organic compound families and reactions, and macromolecules of biological importance such as carbohydrates, lipids, proteins, and nucleic acids. This course is for pre-health, medical science, and liberal arts students, and no recent background in chemistry is required. This course includes a lab.

Prerequisite: High school algebra (or) MATH 1107 (or) placement by multiple measures.

FULFILLS MN TRANSFER CURRICULUM AREA(S) (Leave blank if not applicable)
Goal 1: Communication: by meeting the following competencies:
Goal 2: Critical Thinking: by meeting the following competencies:
Goal 3: Natural Sciences: X by meeting the following competencies:

- Demonstrate understanding of scientific theories.
- Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
- Communicate their experimental findings, analyses, and interpretations both orally and in writing.
- Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

Goal 4: Mathematics/Logical Reasoning: by meeting the following competencies:
Goal 5: History and the Social and Behavioral Sciences: by meeting the following competencies:
Goal 6: The Humanities and Fine Arts: by meeting the following competencies:
Goal 7: Human Diversity: by meeting the following competencies:
Goal 8: Global Perspective: by meeting the following competencies:
Goal 9: Ethical and Civic Responsibility: ____ by meeting the following competencies:
Goal 10: People and the Environment: ____ by meeting the following competencies:

### Prerequisites or Necessary Entry Skills/Knowledge:

High school algebra (or) MATH 1107 (or) placement by multiple measures

### Topics to be Covered (General)

- Chemistry basics: matter and measurement
- Atoms and radioactivity
- Compounds: how elements combine
- Introduction to organic compounds
- Chemical reactions
- Carbohydrates: life’s sweet molecules
- States of matter and their attractive forces: gas laws, solubility, and applications to the cell membrane
- Solution chemistry: sugar and water do mix
- Acids, bases, and buffers in the body
- Proteins: workers of the cell
- Nucleic acids: big molecules with a big role
- Food as fuel: an overview of metabolism

### Student Learning Outcomes

- Identify and convert between various units of measurement including metric and SI systems.
- Classify and describe states of matter, mixtures, and chemical reactions.
- Describe the structure of atoms.
- Identify radiochemical processes and medical applications of radioactivity.
- Write in the language of chemistry, including chemical formulas, names of elements and compounds, and chemical equations.
- Demonstrate the relationship between moles, molar mass, and particles by using conversion factors to correctly solve chemistry problems associated with the above terms.
- Describe the structure of compounds and intermolecular forces.
- Define and identify acids, bases, and buffers.
- Identify functional groups and various classes of organic compounds including hydrocarbons, carbohydrates, lipids, proteins, and nucleic acids.
- Predict products of selected organic reactions and biochemical processes.

### Is this course part of a transfer pathway:

- Yes
- No

Revised 02/21