Upon successful completion of the Chem M12H course, a student should be able to:

1. analyze and apply the scientific method to chemistry problems, including developing a hypothesis, hypothesis testing, evaluation, and modeling.
2. list the basic units of measurement in the metric and English systems, perform unit conversions within and between systems, and express results appropriately with significant figures and in scientific notation.
3. use dimensional analysis to perform mathematical conversions and solve problems involving density, energy, stoichiometry, quantum mechanics, solids, liquids, gases, and solutions.
4. classify matter, distinguish between physical/chemical changes and properties, and comprehend the principles of chemical reactions and energy relationships.
5. list and describe the distinguishing characteristics of solids, liquids, gases, and solutions.
6. describe the quantum mechanical model and construct the historical development of the nuclear atom, explain the nature of atomic spectra, and account for trends in chemical periodicity involving atomic and ionic radii, ionization energy, and electronegativity.
7. identify the symbols of common elements, the structures of molecules and ions, and name various inorganic compounds.
8. write balanced molecular, ionic, and net-ionic equations for synthesis, decomposition, combustion, single-replacement, double-replacement, and oxidation-reduction reactions.
9. apply Lewis and VSEPR theories to draw structures and shapes, label electronic and molecular geometries, and predict polarities for molecules and ions.
10. state the general principles of Arrhenius and Bronsted-Lowry acid/base theories, explain the nature of the pH scale as well as perform pH calculations, and identify buffer solutions.
11. Critically analyze and discuss practical applications of and recent developments in chemistry.
12. Attend and participate in discussions related to chemistry and general science both at Moorpark College and in the greater community.
13. Complete a semester project involving a term paper, poster, and class presentation based on extensive research, collaboration, critical analysis, and appropriate citations.
14. conduct various quantitative and qualitative experiments with strict adherence to safety protocol, record observations and express numerical values using appropriate significant figures, analyze acquired data, and formulate proper conclusions through written expression of results.