Department of Chemistry and Biochemistry
Masters Program Learning Outcomes

Students seeking an MS degree in chemistry will apply and integrate foundational knowledge and critical thinking skills to identify and solve scientific problems. Majors will develop the ability to become contributing members of the scientific community, both as individuals and while working in teams, and will develop the creativity to generate solutions to societal needs.

Students will be prepared to enter careers in chemical, materials science, pharmaceutical, biochemical and molecular life sciences industries; careers in government, education, and academic laboratories; and to pursue advanced education in graduate and professional schools.

Specifically, graduates on the Masters Program will:

I. Expand and deepen knowledge of the molecular sciences beyond that acquired during undergraduate studies.

II. Demonstrate the ability to use scientific processes to identify and address complex scientific problems.
   - Learn to identify complex scientific problems by searching, reviewing and critiquing the scientific literature,
   - Develop and evaluate scientific questions and hypotheses
   - Design methods, including use of appropriate equipment, instrumentation, and computer software, for investigating scientific questions and hypotheses
   - Recognize limitations of experimental methodologies

III. Demonstrate the ability to investigate complex scientific problems using experimental and theoretical methodologies.
   - Manipulate, synthesize, and/or analyze molecules and their properties using contemporary laboratory equipment and methods
   - Generate and record quantitative and qualitative data
   - Apply concepts of approximation, estimation, precision, and accuracy in data acquisition and problem solving
   - Quantitatively analyze data, evaluate validity of data, and interpret meaning from data to generate scientific results
   - Generate conclusions based upon evidence supported by results
   - Model ethical behavior intrinsic to the scientific process of knowledge generation
   - Practice safe handling of equipment, molecules, and organisms

IV. Demonstrate the ability to effectively communicate science
    a. Employ technical and ethical conventions for written and oral reports
    b. Place findings within the context of current scientific knowledge by locating, retrieving, understanding, evaluating, and citing relevant scientific literature
    c. Gain familiarity and practice with the process of working in teams and peer evaluation