



## Chemistry| 2015-2016 Assessment Plan

1. Which outcome will you assess this year (2015-2016)?

An assessment for CHEM 321/323 (Structure of Matter) students was developed to evaluate the learning outcomes in the following

Areas:

- a) knowledge of molecular structure, thermodynamics, kinetics, quantum mechanics and spectroscopy
- b) have the ability to collect and analyze data using computerized methods

2. Which technique will you use to assess this outcome?

During this lab the students had to use different skills in order to complete the assignment.

1. The students need to perform various nonlinear fits to the experimental non-linear data utilizing a least squares method.
2. Perform a baseline subtraction from the spectrum.
3. Have an understanding of quantum mechanics and spectroscopy. Mainly that every peak observed in the spectrum is the result of a transition between discrete energy levels in the rotational and vibrational manifold of states.
4. Have an understanding of the appearance of the fundamental vibration peak. The rotational selection rules give rise to a P-branch and an R- branch that are separately analyzed.
5. Use the fit parameters found in (1) to extract out molecular parameters such as centrifugal distortion constant, Rotation-vibration coupling constant, Rotational constants, Moment of inertia, and ultimately the bond length of the molecule in various vibrational manifolds.
6. Understand Thermodynamics. The analysis of the peak intensities is related to the Boltzmann population among other factors.

3. Which course or group of students will you assess on the outcome chosen above and when?

CHEM 321/323