Scoring Rubric for Program Outcome:
3) An ability to design and conduct experiments, analyze and interpret data

Level 5 performance characterized by:
- Observes good laboratory safety procedures
- Formulates an experimental plan of data gathering to attain a stated objective (develop correlation, test a model, ascertain performance of equipment, etc.)
- Carefully documents data collected
- Develops and implements logical experimental procedures
- Can select appropriate equipment and instruments to perform the experiment
- Is able to operate instrumentation and process equipment
- Analyzes and interprets data carefully using appropriate theory; if required, translates theory into practice or applies to process model(s)
- Is aware of measurement error and is able to account for it statistically
- Seeks information for experiment(s) from multiple sources

Level 3 performance characterized by:
- Unsafe lab procedures observed infrequently
- Develops a simplistic experimental plan of data gathering, does not recognize entire scope of study (e.g. not all parameters affecting the results are investigated)
- Data collected are not all documented, units are missing, or some measurements are not recorded
- Experimental procedures most often followed, but occasional oversight leads to loss of experimental efficiency and/or loss of data
- Needs some guidance in selecting appropriate equipment and instrumentation
- Is tentative in operation of instruments and process equipment
- Applies appropriate theory to data when prompted to do so, but misinterprets physical significance of theory or variable involved; makes errors in unit conversions
- Is aware of measurement error but does not account for it statistically or does so at a minimal level
- Seeks information for experiment(s) from a few sources—mainly from the textbook or the instructor

Level 1 performance characterized by:
- Practices unsafe, risky behaviors in lab
- No systematic plan of data gathering; experimental data collection is disorganized, even random, and incomplete
- Data are poorly documented
- Does not follow experimental procedure
- Cannot select the appropriate equipment and instrumentation required to run the experiment(s)
- Does not operate instrumentation and process equipment, does so incorrectly or requires frequent supervision
- Makes no attempt to relate data to theory
- Is unaware of measurement error
- Seeks no extra information for experiments other than what is provided by instructor