Advanced Chemical Lab Design Course

Objective 1: **Fundamentals and Applications of Theories**

Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in Analytical, Inorganic, Organic and Physical Chemistries. Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

- ❑ I can identify and apply the proper laboratory technique/theory required to reach the desired outcome of the laboratory goal.
- ❑ I can apply appropriate mathematical reasoning and perform calculations within scientific theories.
- ❑ I can apply known scientific principles to develop and support an evidence-based argument.

Objective 2: **Experimental Design**
Students will be able to design and carry out scientific experiments.

- ❑ I can choose and construct the appropriate apparatus, technique, and procedures necessary to accomplish the laboratory goal.
- ❑ I can apply technical and manipulative skills in using laboratory equipment, tools, materials, computer software
- ❑ I can design experiments that are safe and produce minimal waste.
- ❑ I can troubleshoot problems arising during laboratory investigations.
- ❑ I can design experiments to minimize error and uncertainty in results.

Objective 3: **Analysis**
Students will accurately record and analyze the results of scientific experiments.

- ❑ I can identify data and observations necessary to accomplish the laboratory goal.
- ❑ I can identify and interpret a data set for relevant evidence.
- ❑ I can identify and evaluate errors and uncertainty when analyzing and drawing conclusions from data.
- ❑ I can maintain accurate records during a laboratory experiment.

Objective 4: **Communication**
Students will be able to clearly communicate the results of scientific work in oral, written and electronic formats to both scientists and the public at large.

- ❑ I can present my findings clearly, concisely, and on time.
- ❑ I can cite relevant scientific research to support my experimental plan and conclusions.

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RUBRIC

Name:

Title:

Concerns Areas that need work	**Criteria**	**Advanced** Evidence of meeting standard	**Score**
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