

# Colonnade Program Course Proposal: Explorations Category

## CHEM 121 General Education Proposal

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### 1. What course does the department plan to offer in Explorations?

CHEM 121 – College Chemistry Laboratory I

### Which subcategory are you proposing for this course? (Arts and Humanities; Social and Behavioral Sciences; Natural and Physical Sciences)

Natural and Physical Sciences

### 2. How will this course meet the specific learning objectives of the appropriate subcategory? Please address all of the learning outcomes listed for the appropriate subcategory.

Following listed four learning objectives of Natural and Physical Sciences subcategory will meet in CHEM 121.

Students will:

**Colonnade Learning Objective 1:** Demonstrate an understanding of the methods of science inquiry.

CHEM 121 meets objective 1 by having students study the fundamental concepts in chemistry through a series of laboratory activities, which include learning proper techniques for handling solid, liquid, and gas samples.

**Colonnade Learning Objective 2:** Explain basic concepts and principles in one or more of the sciences.

Objective 2 meets by performing laboratory manipulations to understand the theories, concepts, and principles of chemistry that explain observations and make predictions about the natural world.

**Colonnade Learning Objective 3:** Apply scientific principles to interpret and make predictions in one or more of the sciences.

CHEM 121 allows students to understand the concepts of making and recording observations and data, stoichiometry, gas laws, neutralization, VSEPR theory and calorimetry.

**Colonnade Learning Objective 4:** Explain how scientific principles relate to issues of personal and/or public importance.

CHEM 121 is designed to improve scientific literacy in chemical sciences by using the scientific methods, making scientific predictions and theories, and predicting the behavior and outcomes of various chemical systems through a series of laboratory experiments.

**3. Syllabus statement of learning outcomes for course. NOTE: In multi-section courses, the same statement of learning outcomes must appear on every section's syllabus.**

Students who complete CHEM 121 will be able to

1. Apply scientific methods to solve stoichiometry problems involving solids, gases, and solutions.
2. Identify the names and symbols of the majority of the elements in the periodic table, understand structure-property relationship of chemical compounds and use foundational materials to develop critical thinking and problem solving skills.
3. Predict products of and write balanced precipitation reactions using the solubility rules.
4. Understand the scientific method, making scientific predictions, hypotheses, and theories relate to public importance.

**4. Brief description of how your department will assess this course's effectiveness.**

**Outcome 1** is assessed at the end of the semester through selected lab reports. These lab reports are specifically designed to assess understanding of the scientific methods to solve stoichiometry problems involving solids, gases, and solutions.

**Outcome 2 and Outcome 3** are assessed at the end of the semester through selected questions from two exams and multiple quizzes. These exams and quizzes are specifically designed to assess **names and symbols of the majority of elements and chemical compounds and ability to write balanced chemical equations.**

**Outcome 4** is assessed through a specially designed laboratory experiment where students apply scientific methods, predictions, and hypotheses to solve problems in public importance.

**5. How many sections of this course will your department offer each semester?**

Currently, CHEM 121 offers four to six sections each semester.

**6. A sample syllabus for this course.** See below

### Sample Syllabus

#### Chemistry 121: College Chemistry Laboratory I

#### Course Description

A laboratory course to accompany CHEM 120. Through a series of laboratory activities, students will be exposed to fundamental concepts in chemistry and learn how to perform basic laboratory manipulations. Student will learn proper techniques for handling solid, liquid and gas samples and the use of basic laboratory equipment, e.g. pipets, burets, balances, filtration flasks and Bunsen burners. Individual laboratory activities emphasize the concepts of making and recording observations and data, stoichiometry, gas laws, neutralization, VSEPR theory and calorimetry. All course assignments are intended to help you improve both your laboratory and problem solving skills.

#### Learning Outcomes

Students who complete CHEM 121 will be able to

1. Apply scientific methods to solve stoichiometry problems involving solids, gases, and solutions.
2. Identify the names and symbols of the majority of the elements in the periodic table, understand structure-property relationship of chemical compounds and use foundational materials to develop critical thinking and problem solving skills.
3. Predict products of and write balanced precipitation reactions using the solubility rules.

#### Enrollment Requirements

Current enrollment in Chemistry 120 or previous credit for Chemistry 120.

#### Required Text

Custom Published Laboratory Manual by Pearson Educational ISBN 10:1-256-59202-1

### **Additional Materials**

Safety goggles (full surround goggles with indirect venting). Glasses are NOT acceptable.  
Scientific Calculator

### **Grade Evaluation**

Best 6 of 7 lab reports @ 100 pts.      600 pts. [prelab 25 pts., report 75 pts.]

2 exams @ 100 pts.                              200 pts.

Nomenclature exam                              100 pts.

Nomenclature quizzes/exercises              100 pts.

Total possible points                              1000 pts

Grades are based on the total number of points earned on the lab reports and exams. There is NO extra credit.

>900 90.0 % A

>800 80.0 % B

>700 70.0 % C

>600 60.0 % D

< 600 F