

## Colonnade Program Course Proposal: Explorations Category

### CHEM 116 General Education Proposal

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

CHEM 116 – Introductory course for College Chemistry

#### 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 116.

Students will:

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

CHEM 116 meets objective 1 by having students study the fundamental scientific accomplishments related to chemistry and chemical interactions, and explore the fundamental questions regarding the nature of matter and its transformations.

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

Objective 2 meets by developing basic models to understand structure-property relationship of chemical compounds and use foundational materials to develop critical thinking and problem solving skills.

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

CHEM 116 allows students to develop interpretive and predictive tools through exploring fundamental questions related to chemical reactions such as acid-base reactions, redox reactions, and gas laws.

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

CHEM 116 is designed to improve scientific literacy in chemical sciences by understanding scientific methods, making scientific predictions and theories, and predicting the behavior and outcomes of various chemical systems.

**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 116 will be able to

1. Apply the fundamental scientific accomplishments related to chemistry and chemical interactions.
2. Understand structure-property relationship of chemical compounds and use foundational materials to develop critical thinking and problem solving skills.
3. Explore the fundamental questions regarding the nature of matter and its transformations such as acid-base reactions, redox reactions, and gas laws.
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 questions from exams, quizzes, and homework. These assignments are specifically designed to assess understanding of the fundamental scientific accomplishments related to chemistry and chemical interactions through learning properties of matter, atomic theory and the periodic table, and chemical reactions.

**Outcome 2** is assessed at the end of the semester through selected questions from exams, quizzes, and homework. These assignments are specifically designed to assess structure-property relationship of chemical compounds and critical thinking and problem solving skills.

**Outcome 3** is assessed through selected quizzes, homework assignments, and exams. These assignments are designed to assess understanding of reaction transformations such as acid-base reactions, redox reactions, and gas laws.

**Outcome 4** is assessed through specially designed multiple questions in the final exam 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 116 offers two sections each semester.

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

**Sample Syllabus**

**Chemistry 116: Introductory Course for College Chemistry**

**Textbook:**

General Chemistry, 10th edition, Ebbing and Gammon

**Course Description:**

This course is designed for students desiring a general survey of chemistry with a mathematical emphasis. CHEM 116 is an introductory course for College Chemistry students whose ACT score in science and/or mathematics, or whose Chemistry Placement Exam scores would indicate marginal success in CHEM 120. Does not count toward a major/minor in chemistry nor does it satisfy the requirements for certain consumer and family science or agriculture majors. CHEM 106 laboratory is optional. A student cannot use both CHEM 101 and 116 for general education credit.

**Learning Outcomes:**

Students who complete CHEM 116 will be able to

- Apply the fundamental scientific accomplishments related to chemistry and chemical interactions.
- Understand structure-property relationship of chemical compounds and use foundational materials to develop critical thinking and problem solving skills.
- Explore the fundamental questions regarding the nature of matter and its transformations such as acid-base reactions, redox reactions, and gas laws.

- Understand the scientific method, making scientific predictions, hypotheses, and theories relate to public importance.

**Topics covered:**

Chapter 1: Chemistry and Measurement  
Chapter 2: Atoms, Molecules, and Ions  
Chapter 3: Calculations with Chemical Formula and Equations  
Chapter 4: Chemical Reactions  
Chapter 5: The Gaseous State

**Expectations:**

Students enrolling in this course are expected to:

Attend class regularly and actively participate  
Read the textbook before coming to class  
Spend a minimal of 2 hours outside of class for each hour of lecture  
Complete the homework assignments  
Be present and on time for quizzes and exams  
Ask questions inside or outside of class if you are having trouble

**Attendance:**

Attendance will not be a calculated part of your grade but there will be some in class assignments will be given. There will be NO make-ups for any of the following assignment types: in-class problem sets, homework problems or timed assessments. You must be present and on time for quizzes and exams. For missed exam or quiz, a valid and documented excuse (e.g. death in the family, school sponsored activity) is required; persons who are going to miss an exam or quiz must contact the instructor prior to the test to confirm that the absence is acceptable and schedule a prompt make-up test date and time. If you fail to do this, the professor is under no obligation to give a make-up test.

**Calculator policy:**

You will need a basic calculator that will add, subtract, multiply, and divide. YOU CANNOT use your phone, PDA or any/programmable scientific calculator in this class.

**Cell phone policy:**

Please refrain from using your phone in class for any purpose. Both you and your classmates pay a great deal of money to be here so please be considerate of others. If you are caught using a phone in class, 5 points will be deducted from your grade and you will be asked to leave the class. No make ups will be allowed for any missed information due to your absence.

**Grading:**

90-100% (675-750) A  
80-90% (600-674) B  
70-80% (525-599) C

60-70% (450-524) D  
Below 60% (<449) F