

# Colonnade Program Course Proposal: Explorations Category

## CHEM 101/102 General Education Proposal

Contact: Hemali Rathnayake ([hemali.rathnayake@wku.edu](mailto:hemali.rathnayake@wku.edu))

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

CHEM 101/102- Introduction to 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.

Four learning objectives of Natural and Physical Sciences subcategory is met in CHEM 101/102 as describe below.

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

CHEM 101 meets objective 1 by learning the scientific method through observations, hypotheses, and theory development in the classroom. At least one laboratory exercise in CHEM 102 covers understanding of one scientific method.

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

Objective 2 is met by developing basic models to understand the structure-property relationship of chemical compounds.

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

CHEM 101/102 allows students to develop interpretive and predictive tools through laboratory experiments and to explore fundamental questions related to chemical reactions such as acid-base reactions.

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

CHEM 101/102 is designed to improve scientific literacy in chemical sciences by understanding the scientific method, making scientific predictions, hypotheses, and theories.

**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 101 and CHEM 102 will be able to

1. Apply the scientific method in basic chemical reactions through their molecular structures and simple acid-base chemical reactions
2. Identify and use basic chemistry equipment
3. Perform experiments that relate to real world situations such as freezing ice cream and using salt to melt ice.
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 scientific methods through formulating molecular structures and acid-base reactions.

**Outcomes 2 and 3** are assessed through three of the specially designed laboratory experiments where students use basic chemistry equipment to perform experiments that assess the knowledge of acid-base reactions and understanding of real world situations.

**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, two sections of this course are offered each semester.

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

## Sample Syllabus

### Chemistry 101/102: Introduction to Chemistry

#### Textbook:

Joesten, M.; Hogg, J.; Neu, D. CHEM 4LTR, 1<sup>st</sup> ed., Brooks/Cole, Cengage Learning: Belmont, CA, 2011. ISBN-10: 0-538-73821-9; ISBN-13: 978-0-538-73821-7

#### Course Description:

CHEM 101 - Introduction to Chemistry (3 Credit hours) meets the three learning objectives included in the Quantitative Reasoning section of the Colonnade Plan. A one-semester terminal course CHEM 101 covering applied chemistry and environmental considerations, which can be used for general education requirements in the science field for non-science majors and minors. In-class laboratory constitutes 20 percent of class. It does not count toward a major or minor in chemistry, nor does it satisfy the requirements for certain home economics and agriculture majors. Through coursework and laboratory exercises, the Department of Chemistry cultivates an understanding of the scientific method and knowledge of natural science and its relevance in our lives. The creation and development of scientific knowledge through observation, experimentation, and reasoning is used to illustrate scientific theories, concepts, and principles.

#### Learning Outcomes:

Students who complete CHEM 101 and CHEM 102 will be able to

1. Apply the scientific method in basic chemical reactions through their molecular structures and simple acid-base chemical reactions
2. Identify and use basic chemistry equipment
3. Perform experiments that relate to real world situations such as freezing ice cream and using salt to melt ice.
4. Understand the scientific method, making scientific predictions, hypotheses, and theories relate to public importance.

#### Course Content

Our goal will be to cover part or all of chapters 1-3, 5, 8-12 and 14 in the text.

#### Laboratory Content

We will complete six (6) laboratory exercises related to the course materials. Specific activities will be announced in class and posted on Blackboard.

#### Attendance

Attendance is mandatory; missing class will adversely affect your final grade. You may be assigned a grade of 'F' for excessive absenteeism if you miss seven (7) meetings for any reason before March 20.

### **In-Class Quizzes**

There will be five (5) In-Class Quizzes, each covering three to four class meetings. In-Class Quizzes will be given on the designated dates, be multiple-choice, and cover class notes and discussion in addition to assigned text reading.

### **Homework**

There will be twenty (20) Homework Assignments administered through Blackboard. You may have up to three attempts on each Homework Assignment with the higher score being retained. Homework Assignments will be available up to the time of the In-Class Quiz covering that chapter. There will be no make-ups on Homework Assignments.

### **Labs**

Lab reports must be submitted before leaving the lab for the day, or no credit will be given. Eye protection may be required in some labs and will be provided for those not wearing glasses.

### **Missed in-class quizzes and labs**

Make-ups for in-class quizzes and labs will not be given for any reason. If you miss one in-class quiz, you will be assigned a replacement grade equal to that of your lowest in-class quiz grade. An unexcused absence on the date of a lab will result in a grade of zero for that lab.

### **Final Exam**

The final exam will be based directly on the questions on the In-Class Quizzes.

### **Grading**

89.5% + - A	79.5-89.4% - B	69.5-79.4% - C
59.5-69.4% - D	59.4% - F	