Colonnade Program Course Proposal: Explorations Category

CHEM 120 General Education Proposal

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

   CHEM 120 – College Chemistry 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 120.

   Students will:

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

   CHEM 120 meets objective 1 by having students study the basic principles of chemistry including standards of measurement, properties of matter, atomic theory and structure, the periodic table, chemical reactions and equations, gas properties, thermochemistry, and phase changes.

   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 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 120 allows students to identify the names and symbols of the majority of the elements in the periodic table, and to classify at least some of their properties based on their position within the table. Nomenclature allows students to identify chemical formulas as the words of the chemical language and predicting chemical names of given chemical formulas.

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

CHEM 120 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.

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 120 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. Explore the fundamental relationships connecting pressure, volume, temperature, and number of moles to predict changes to the state of the gas.
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 first two exams, and first four homework. These assignments are specifically designed to assess understanding of the scientific methods through standards of measurement, properties of matter, atomic theory and the periodic table, stoichiometric problem solving and gas laws.

Outcome 2 is assessed at the end of the semester through selected questions from second and third exams and homework. These exams and 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 final exam. These assignments are designed to assess understanding of properties of liquids, solids, and gas.

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 120 offers two or three sections each semester.

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

Sample Syllabus

Chemistry 120: College Chemistry I

Textbook:
General Chemistry, 10th edition, Ebbing and Gammon

Course Description:

CHEM 120 – College Chemistry I (3 Credit hours) meets the three learning objectives included in the Quantitative Reasoning section of the Colonnade Plan. The first year of College Chemistry is intended to provide a basic background in the principles of chemistry. A partial list of topics include: dimensional analysis, atomic structure, chemical reactions and calculations, thermochemistry, gas laws, electronic configurations and quantum theory, ionic and covalent bonding, VSEPR theory, and intermolecular forces. The primary purpose of this course is to increase students' ability to critically think and analyze data and information to solve problems for whatever career path students choose.

Learning Outcomes:

Students who complete CHEM 120 will be able to

5. Apply scientific methods to solve stoichiometry problems involving solids, gases, and solutions.

6. 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.
7. Explore the fundamental relationships connecting pressure, volume, temperature, and number of moles to predict changes to the state of the gas.

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