

Colonnade Program Course Proposal: Explorations Category

CHEM 105/106 General Education Proposal

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

CHEM 105/106- Fundamentals of General Chemistry Class and Laboratory course

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 105/106.

Students will:

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

CHEM 105 meets objective 1 by learning the scientific method through understanding properties of matter, gas laws, and atomic theory. At least one laboratory exercise in CHEM 106 covers understanding of the scientific method.

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 properties of matter, gas laws, and atomic theory.

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

CHEM 105/106 allows students to develop interpretive and predictive tools through laboratory experiments and to explore fundamental questions related to properties of matter.

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

CHEM 105/106 is designed to improve scientific literacy in chemical sciences by understanding the scientific method, making scientific prediction to 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 105 and CHEM 106 will be able to

1. Apply the scientific method in basic principles including standards of measurement, properties of matter, atomic theory and the periodic table, chemical reactions and equations, solution properties, and gas laws.
2. Identify and use basic chemistry equipment and will perform experiments to understand properties of matter in real world using chemical reactions.
3. Apply IUPAC rules to name chemical compounds.
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 standards of measurement, properties of matter, atomic theory and the periodic table, chemical reactions and equations, solution properties, and gas laws.

Outcome 2 is assessed through three of the specially designed laboratory experiments where students use basic chemistry equipment to perform experiments that learn properties of matter in real world using chemical reactions.

Outcome 3 is assessed through selected quizzes, homework assignments, and exams. These assignments are designed to assess understanding of naming chemical compounds using IUPAC rules.

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 105 offers two sections and CHEM 106 offers four sections each semester.

6. A sample syllabus for this course. See below

Sample Syllabus

Chemistry 105: Fundamentals of General Chemistry

Textbook:

Hein, Best, Pattison, Arena; Introduction to General, Organic, and Biochemistry. 10th Edition

Solutions Manual for Introduction to General, Organic, and Biochemistry.

Course Description:

CHEM 105 course fulfills part of the D-I (Science/ Mathematics) general education requirement. Students will become familiar with basic principles including standards of measurement, properties of matter, atomic theory and the periodic table, chemical reactions and equations, solution properties, and gas laws. The quizzes and exams throughout the semester will be designed to improve students' abilities to understand and apply these concepts. CHEM 106 - Laboratory course (1 Credit hour) is required and accompanies this course to gain laboratory experience.

Learning Outcomes:

Students who complete CHEM 105 and CHEM 106 will be able to

1. Apply the scientific method in basic principles including standards of measurement, properties of matter, atomic theory and the periodic table, chemical reactions and equations, solution properties, and gas laws.
2. Identify and use basic chemistry equipment and will perform experiments to understand properties of matter in real world using chemical reactions.
3. Apply IUPAC rules to name chemical compounds.
4. Understand the scientific method, making scientific predictions, hypotheses, and theories relate to public importance.

Expectations:

Students enrolling in this course are expected to:

Attend class regularly and actively participate

Read the textbook before coming to class

Spend a minimum 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:

Regular attendance is vital to success in chemistry and is expected of all students. Please come to class each period and be prepared to take notes, quizzes and ask questions/receive answers. Class (and its obligations; tests, quizzes, etc) will be held unless the University cancels all classes or you are notified by the instructor via e-mail or Blackboard announcement.

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.

Extra Credit:

Extra credit will be given for attending PASS or other tutoring venue (with proof of attendance and participation). Students may receive up to 16 points extra credit added to their total course points. One half point will be given for attending PASS, one-on-one tutoring sessions with Mrs. Brooks or in The Learning Center, or tutoring from the Chemistry Dept. Tutoring Center. No more than 2 points may be earned in any one-week. Students must sign in when attending PASS, TLC Tutoring sessions, or Chem. Dept. Tutoring Center. The Chemistry Dept. Tutors will also supply tutoring slips. These sign in sheets along with discussions I have with tutors will confirm receipt of extra credit points. This opportunity is solely intended to provide the extra support needed for students to succeed in chemistry. It is not intended to replace class attendance and if students take advantage of this opportunity (i.e. 10 min. sessions, lack of participation, absences from class, etc.), points will not be given.

Grading:

Regular completion of homework is crucial to success in chemistry. Problems will be assigned periodically from the textbook or on-line via Blackboard. (Homework is not graded.) Bring any questions dealing with homework to my attention during office hours or class, use the Chemistry Tutoring Center FREE OF CHARGE located in TCNW 317; hours are Mon-Thur, 10am-1pm and 2:30-4:00pm, or use PASS.

Five, 25 point quizzes will be given throughout the semester. Quizzes may ONLY be made up if the absence is known ahead of time AND the quiz is taken PRIOR to the absence. One quiz grade will be dropped (NOT quiz 2, ions). Scores on the remaining four quizzes are

averaged and count as a test grade.

There will be 4 one hour (~100 point) exams composed of problems, multiple choice, and short answer questions. Every exam will cover 2-4 chapters in the text, lecture material that I present (even if it is not in the text), and assigned homework. Missed exams are allowed to be made up ONLY if I am notified PRIOR to absence and an acceptable, verifiable excuse is provided. Acceptable excuses include: personal illness, death in the family, WKU function, etc. The final exam is comprehensive and worth 150 points.

Grading:

89.5% or Up - A

79.5-89.4% - B

69.5-79.4% - C

59.5-69.4% - D

59.4% - F

Sample Syllabus

Chemistry 106: Fundamentals of General Chemistry Laboratory

Text Book:

Chem Lab: Experiments in General, Organic, and Biochemistry by Henrickson, Byrd & Hunter, 2nd ed., published by Kendall/Hunt

Learning Outcomes:

CHEM 106

Students who complete CHEM 105 and CHEM 106 will be able to

1. Apply the scientific method in basic principles including standards of measurement, properties of matter, atomic theory and the periodic table, chemical reactions and equations, solution properties, and gas laws.
2. Identify and use basic chemistry equipment and will perform experiments to understand properties of matter in real world using chemical reactions.
3. Apply IUPAC rules to name chemical compounds.
4. Understand the scientific method, making scientific predictions, hypotheses, and theories relate to public importance.

General Information:

Attendance is a REQUIRED part of this lab. If you are unable to attend lab, please let me

know in advance so we can make appropriate arrangements. You may make up only one (1) lab this semester and it must be made up during the week you miss lab. More than one absence will result in a grade of zero for every missed lab experiment. In the event that you must miss your regularly scheduled lab section, you have the “limited” option of attending another lab section that week.

Basic lab safety rules must be followed in this lab. NO food, drinks, or tobacco products are permitted in the laboratory. Protective eye and foot gear (safety goggles and covered shoes, NO sandals) MUST BE WORN at all times. Appropriate clothing is also necessary; NO-tank tops, exposed midriff shirts or shorts. Electronic devices, such as cell phones, are not to be used during lab lecture and should only be used sparingly when performing experiments (such as when waiting on an experiment). Individuals failing to follow such basic rules will have 10 points deducted per offense. If only one offense occurs the entire semester, it will be forgiven. If more than one offense occurs, points will be deducted at the end of the semester. Preliminary exercises, lab reports and nomenclature homework must be completed by each individual (no “copying”) for each experiment. Late lab reports or homework are not accepted. Work is considered late if it is not submitted at the conclusion of the lab period.

Grade:

Each experiment is graded and points vary depending on the nature of the lab. Quizzes (20 pts each) will be given almost every period in which an experiment is performed. Fifteen points of the quiz will cover material from the previous week’s lab and 5 points will be from the current lab. The lowest quiz grade will be dropped. There will be four nomenclature homework assignments each worth between 30 and 50 points. There will be a midterm exam worth 100 points, and a final exam worth 100 points.

Total possible points: 927 minus lowest quiz (20) = 907.