

**Bergen Community College**  
**Division of Mathematics, Science and Technology**  
**Physical Science Department**

**Course Syllabus**  
**CHM-241 General Chemistry Laboratory II**

**COURSE DESCRIPTION:**

**CHM-241** General Chemistry Laboratory II is a continuation of CHM-141, with greater emphasis on more sophisticated experiments and equipment. It complements the material covered in CHM-240. Written lab reports are required.

**COURSE CREDITS/HOURS:** 1 credit/3 hours

**PREREQUISITE:** CHM-140 and CHM-141 with grades of C or better

**PREREQUISITE OR**

**CO-REQUISITE:** CHM-240

**GENERAL ED COURSE:** Yes

**STUDENT LEARNING OBJECTIVES:** As a result of meeting the requirements in this course, students will be able to:

1. Write laboratory reports that conform to accepted technical writing protocols.
2. Use Excel for the representation of experimental data in graph form.
3. Report calculated results with correct precision.
4. Translate written and oral experimental directions into accepted laboratory practices.
5. Use a spectrophotometer and relate concentration of chromophores with Absorption.
6. Explain the relationship between solubility and temperature.
7. Explain equilibrium and the factors that affect equilibrium.
8. Explain the relationships between colligative properties, freezing point, molality and molar mass.
9. Explain reaction kinetics and the factors that affect reaction rates.
10. Use a pH meter and a buret as parts of laboratory protocols.
11. Standardize solutions and perform titrations.
12. Explain the qualitative analysis of cations.
13. Build a voltaic cell and measure the voltage of the system.
14. Use computer integrated technology to collect and analyze data.
15. Apply laboratory safety rules.
16. Demonstrate acceptable laboratory technique in the use of equipment and handling of chemicals.
17. Design a simple experiment based on learned techniques.

**LABORATORY MANUAL:**

A spiral bound book of experiments (CHM 241 Bergen Community College) is available for purchase in the B.C.C. bookstore.

**OTHER REQUIREMENTS:**

**Safety goggles or glasses** are required and may be purchased at the bookstore or hardware store.

A **scientific** calculator is **required**.

## **ASSESSMENT MEASURES:**

The student learning objectives will be assessed by:

1. Laboratory Reports (format, data sheets, calculations, graphs, post-lab exercises)
2. Pre-Laboratory Exercises
3. Observation of acceptable laboratory techniques
4. Observation of consistent implementation of safety rules
5. Instructor-student and student-student discussion of data and experimental results
6. Tests

## **COURSE CONTENT:**

Chemistry laboratory safety

Chemistry laboratory techniques

Use of sophisticated software and equipment

Experiments that emphasize the topics contained in General Chemistry II. A detailed list of experiments is found on the CHM-241 Lab Schedule (last page).

Data collection, data analyses and graphical representation of data and/or results

Use of factor label method/dimensional analysis for problem solutions.

Laboratory report writing

## **GRADING POLICY**

### **Instructor's Grading Policy:**

The specific grading policy will be provided separately by the instructor at the first class session.

### **General Grading Policy Guidelines:**

1. Laboratory Reports (see format and content below) .....60 - 70 %
2. Examinations (two to three) .....30 %
3. Quizzes or Pre-Laboratory Assignments .....not more than 10%
4. Safety Violations .....deduction of points

Laboratory or examination make-ups will be provided only in certain circumstances at the discretion of the instructor. The instructor's policy for make-ups and late reports will be provided at the first class session. All such make-ups must be resolved within a week of the missed class. Any missed laboratory exercise or examination will result in a grade of zero.

Conduct demonstrating a lack of integrity will not be tolerated. This includes, but is not limited to, cheating (copying or using unauthorized formula sheets), plagiarism, and falsification of data (using fictional data or data from another student, past or present).

**Please consult The Bergen Community College Statement on academic integrity, as found in the college catalog or Student Handbook, for details and consequences of such behavior.**

## **ATTENDANCE POLICY:**

Attendance at laboratory sessions is mandatory, and students are expected to report to class on time. Reports and any pre-lab assignments are due **at this time**. At the start of the session, instructions are given concerning the proper and **safe** performance of the experiment. Students arriving after this presentation are not permitted to perform the experiment.

## **OTHER POLICIES:**

**Electronic Devices:** The use of portable electronic devices is not permitted in the laboratory.

**Code of Student Conduct:** Students are encouraged to read, understand and follow the rules and standards of conduct as explained in the BCC Student Handbook.

## **DATA RECORDING AND LABORATORY REPORT FORMAT:**

1. Data is to be recorded directly onto data sheets.  
NO SCRATCH PAPER.
2. Use **blue** or **black** ink to record all data. NO WHITE-OUT.  
If a mistake is made in recording data, neatly cross out the mistake with a single line, and enter the correct data nearby.
3. Data sheets must be signed and dated by the instructor before the end of the lab period.
4. Students are required to perform his/her own lab work. Students will be informed when there is a need to work with a partner.
5. Laboratory reports are due no later than one week after the completion of the experiment and must be submitted at the beginning of the lab period in which it is due.  
Lateness in submission may result in penalty points at the discretion of the instructor.
6. LAB REPORT CONTENT:  
Follow the following order with regard to organization of pages, and staple all pages together.
  1. Cover page: title of experiment, student name, instructor name, date of the experiment
  2. Data sheets (instructor initialed and dated) with supporting calculations.  
Sample calculations **must** be clearly shown, with the correct units included.
  3. Any required Graphs, prepared in Excel.
  4. Post lab exercises, including any post lab graphs, prepared in Excel.
  5. Summary paragraph: A short paragraph (approximately ten sentences) containing the objectives of the experiment, how the objectives were met, the results, and a discussion of possible sources of scientific error in cases where the results did not meet the expected objectives.

## **STUDENT SUPPORT SERVICES:**

The STEM Walk-In Learning Center in Room L-131 and the CLAC Tutoring Center in L-125 provide student support in chemistry, math and other sciences.  
Faculty office hours may be a productive vehicle for assistance in understanding course material.  
The BCC Library provides extensive support services for student research.

### *Services for Students with Disabilities:*

A wide variety of services are available to students with documented disabilities through the Office of Specialized Services (OSS). For further information, go to the OSS website: [www.bergen.edu/oss](http://www.bergen.edu/oss)

## **FACULTY ABSENCE PROCEDURE:**

A daily listing of cancelled classes will appear in a glass case near the registration area on the first floor. Cancelled classes are also listed under class cancellations at bottom of the BCC website page. Under no circumstances are notices regarding class cancellations taped to classroom doors.

If students find a class cancelled which has not been listed, they should report this to the Divisional Dean's Office, A-325 or the Evening Office L-113.

## CHM-241 SAMPLE LAB SCHEDULE\*

WEEK	EXPERIMENT	NUMBER
1.	Check In / SOLUBILITY	01
2.	SPECTROSCOPY	02
3.	<u>PREPARATION AND ANALYSIS</u> OF A COPPER COMPOUND (Week 1)	03A
4.	PREPARATION AND <u>ANALYSIS</u> OF A COPPER COMPOUND (WEEK 2)	03B
5.	MOLAR MASS BY FREEZING POINT DEPRESSION	04
6.	Quiz One	
	CHEMICAL KINETICS (Week 1)	05
7.	CHEMICAL KINETICS (Week 2)	05
8.	EQUILIBRIUM	06
9.	ACID-BASE TITRATION - pK <sub>a</sub> (Week 1)	07
10.	ACID-BASE TITRATION - PK <sub>a</sub> (Week 2)	07
11.	Quiz Two	
	CATION ANALYSIS (Week 1; knowns)	08
12.	CATION ANALYSIS (Week 2; unknowns)	08
13.	VOLUMETRIC DETERMINATION OF HYDROGEN PEROXIDE	09
14.	ELECTROCHEMICAL CELLS & REDUCTION POTENTIALS	10
15.	Cumulative Test Three clean up, check out and	

**\*The dates of all lab exercises and exams will be announced by the individual instructor.**

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All BCC students enrolled in credit courses are entitled to a WebAdvisor account. With WebAdvisor, you may register online, pay your bill, check your schedule, room assignments, GPA, and find out what courses you need to take. To find out more about WebAdvisor or to sign up online, visit <http://go.bergen.edu>! While there, please make sure you give us your preferred email address. You'll find directions how to do this at <http://go.bergen.edu/email>.