

**Master Syllabus**

**COURSE: CHEM 1115 GENERAL CHEMISTRY I LAB (Science Majors)**

**CRN:**

**CREDIT HOURS (Lecture/Lab/Total): 0/1/1**

**CONTACT HOUR (Lecture/Lab/Total): 0/15/15**

**INSTRUCTOR INFORMATION**

**Name:**

**Email:**

**Phone:**

**Office:**

**Office Hours:**

**Class Location:**

**COURSE DESCRIPTION:** This laboratory course is designed to illustrate the material studied in CHEM 1100. Students will participate in experiments that involve mass/volume measurement and relationships, yield and stoichiometry, calorimetry and thermochemistry, and the manipulation and measurement of gases. Laboratory fee is required.

**PREREQUISITES:**  Registration in or prior credit for CHEM 1100.

## LEARNING OUTCOMES: The objective of the CHEM 1115 laboratory course is to understand the techniques used by practicing chemist, to carry out experiments safely and carefully in the laboratory, to obtain data accurately and to manipulate the data correctly. This course also complements and consolidates the theoretical knowledge acquired in CHEM 1100 lecture course. In as much as this course is only a supplement to CHEM 1100, students must either have had the general chemistry lecture or must be taking the course concurrently.

**ASSESSMENT MEASURES:** Upon completion of this course, students will understand:

**Basic Lab Measurements and Equipment:**

1. To measure quantities in lab using a variety of measuring tools.

2. To learn the limitations and uncertainties associated with measuring tools typically used in

introductory chemistry labs.

3. To determine which volume measuring devices provide the greatest accuracy and least

uncertainty for measuring liquids.

4. To correctly set up and use a laboratory burner.

**Determination of Density:**

1. To gain experience using a balance.

2. To learn to use and read a burette.

3. To reinforce the concepts of accuracy, precision and uncertainty in measurement.

4. To measure volume of a solid using dimensions and/or liquid displacement.

**Determination of Empirical Chemical Formulae:**

1. To determine the empirical formula for a hydrated copper chloride salt by determining the

masses of copper, chlorine, and water present in the sample.

2. To determine conditions under which compounds can be dehydrated and separated into their

individual components.

3. To gain experience in performing calculations using moles and chemical formulas.

**Stoichiometry and Percent Yield:**

1. To prepare potassium aluminum sulfate (one of a group of compounds called “alums”) by the

reaction of aluminum with hydroxide followed by sulfuric acid.

2. To determine limiting reagent and calculate theoretical yield.

3. To calculate percent yield from the actual yield and the theoretical yield.

4. To separate a mixture of substances using filtration.

**Data Reduction: The Viscosities and Densities of Mixtures:**

1. To gain knowledge of viscosity

2. To obtain laboratory data and use it to calculate values of other quantities (data reduction)

3. To make graphs of observed and calculated data obtained in the laboratory.

4. To determine liquid densities using either Westphal balances or pycnometers.

**Thermochemistry: Specific Heat of a Metal:**

1. To determine the specific heat of a metal using the method of mixtures.

2. To use the Law of Dulong-Petit to determine approximate molar mass.

3. To apply critical thinking to the identification of an unknown metal from physical and

experimental evidence.

**Observations on Gases: Gas Laws:**

1. To measure gas pressures using barometers and pressure gauges.

2. To study the fundamental relationships between pressure, volume, and temperature for gases.

3. To use spreadsheet calculations to transform non-linear data into linear data.

4. To employ curve-fitting programs and statistical analysis to evaluate linear relationships.

**Chemical Stoichiometry and Gases:**

1. To use Dalton’s law of partial pressures in collecting a gas over water

2. To use the gas laws and stoichiometry to calculate the percent NaHCO3 in an impure sample

3. To learn about vapor pressure of liquids

**Vapor Pressure and Heat of Vaporization:**

1. To measure the vapor pressures and boiling points of liquids at various pressures.

2. To manipulate data to obtain a linear relationship between temperature and pressure

3. To prepare a graph and obtain the slope of a straight-line graph

4. To use the Clausius-Clapeyron Equation to determine ΔHvap of liquids by graphical means.

**Properties of Ionic and Molecular Covalent Compounds:**

1. To qualitatively determine the melting point range for several compounds.

2. To determine the electrical conductivity of several compounds.

## 3. To determine if ionic and molecular covalent compounds differ in these physical properties.

## TEXTBOOK/S: TBD

**SUPPLIES AND EQUIPMENT:**  Lab Fee

**ATTENDANCE POLICY:** It is the student’s responsibility to maintain regular contact with instructors. Class attendance is the responsibility of the student. All students must be officially enrolled in any course that they attend. It is expected that students attend all classes and be on time. If an absence occurs, it is the responsibility of the student for making up examinations, obtaining lecture notes, and otherwise compensating for what may have been missed. Students who stop attending class and do not officially drop, withdraw, or resign from the college may receive a grade of “F” for all coursework missed. Absences affect performance in this course and do not reflect well on participation. No student may substitute the attendance of another student. **Online students must be actively participating in online courses to be considered making progress.** **Hybrid students must attend face-to-face meetings as well as complete online assignments.**

Students should frequently check Canvas (Learning Management System) for notifications and updates to the course. Students are expected to use the online resources provided by NTCC to:

1. Track course assignments and progress

2. Discuss topics and issues with fellow students

3. Turn in assignments, quizzes, and tests

4. Check for any updates, changes or alterations to the course

5. Access all course materials to include presentations, assignments, quizzes, and tests.

## GRADING REQUIREMENTS: Lab reports (10) 250

## quizzes (10) 100

## midterm exam 100

## final exam 100

## TOTAL 550 pts.

**GRADING SCALE:** 90-100% A

80-89 % B

70-79% C

60-69% D

0-59% F

**ACADEMIC INTEGRITY AND CONDUCT:** Students are expected to maintain the highest standards of academic integrity. Behavior that violates these standards is not acceptable. Plagiarism, cheating, and other forms of academic dishonesty are prohibited and are subject to disciplinary actions established in the Student Code of Conduct. The instructor reserves the right to assign a grade of “F” on any type of assignment or examination based on evidence that the student has violated the Student Code of Conduct.

**STUDENT BEHAVIOR/CLASSROOM DECORUM:** Students are encouraged to discuss, inquire, and express their thoughts and views during class. Classroom behavior that interferes with either the instructor’s ability to conduct the class or the ability of students to benefit from the instruction is not acceptable. Students are required to turn off all cell phones or similar electronic devices (or place them on silent mode) before coming into the classroom. The instructor reserves the right to assign no credit for work on that day if a student talks or texts on a cell phone or similar electronic device. The classroom is not a place for children, and students are not to bring their family members into the classroom.

**DISABILITY CODE:** If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Student Affairs. No accommodations are granted without documentation authorized from Student Affairs.

**WITHDRAWAL POLICY:** The last day to withdraw from a course or resign from the college is **\_\_\_\_\_\_\_\_\_\_\_\_\_**. If you intend to withdraw from the course or resign from the college, you must initiate the action by logging into LoLA. The instructor will not withdraw you automatically.

**COMMUNICATION POLICY:** My.NorthshoreCollege.Edu is the official student email communication within Northshore Technical Community College. Therefore, the College has the right to send communications to students via their College email address and the right to expect that those communications will be received and read in a timely fashion. Every student is assigned a My.NorthshoreCollege.Edu. Students can redirect their College email address to an outside email provider. However, the College is not responsible for handling outside email providers, and redirecting their College email address does not absolve a student from their responsibilities associated with communication sent to their official College email address.

**COPYRIGHT POLICY:** Unless a student has obtained permission from the copyright holder, it is a violation of Copyright Law to print or photocopy chapters from a textbook that the student did not purchase. If the course requires the use of an electronic textbook, a student must look for a statement that allows for photocopying and/or printing of the eTextbook.

**NETIQUETTE POLICY:** This term is used to describe accepted, proper behavior on the Internet. Remember the following when communicating online (messages, discussion board, etc.):

* Never post profanity, racist, or sexist messages
* Be respectful of fellow students and instructors
* Never insult any person or their message content
* Never plagiarize or publish intellectual property
* Do not use text messaging abbreviations or slang
* Do not type in all CAPS (this is considered online yelling)