Miami Dade College

Course Description

CHM2124C | Survey of Quantitative Analysis | 4.00 credits

This course is a one-semester combination lecture-laboratory course covering the theories, calculations, and methodologies used in analytical chemistry. Topics include mathematical treatment of data; aid-base equilibria; and Gravimetric, volumetric, and potentiometric methods of analysis. Prerequisites: CHM 1046, 1046L with a grade of "C" or better. Special fee.

Course Competencies:

Competency 1: The student will demonstrate the following effective objectives concerning safety in the laboratory by:

1. Demonstrating a commitment to safety by following all safety rules and procedures.
2. Demonstrating a professional attitude and respect for laboratory responsibilities by maintaining the laboratory areas in a clean and neat manner.
3. Demonstrating a willingness to respond to the course material by attending class regularly.
4. Demonstrating responsibility for completing laboratory work by coming to the laboratory prepared to perform all procedures scheduled for the laboratory session.

Competency 2: The student will learn the following cognitive objectives from the laboratory experience by:

1. Describing the importance of accurate and precise measurements in science.
2. Applying dimensional analysis to solve unit conversion problems.
3. Demonstrating the ability to use the metric system of measurements by solving metric conversion problems.
4. Defining density and measuring mass and volume to calculate the density of liquids and solids.
5. Solving density problems.

Competency 3: The student will demonstrate knowledge of matters classification, properties, and changes by:

1. Distinguishing between the physical and chemical properties of matter.
2. Distinguishing between the physical and chemical changes that matter undergoes.
3. Characterizing the three common states of matter.
4. Identifying the significance of the coefficients in a balanced chemical equation.
5. Applying stoichiometric relationships.

Competency 4: The student will demonstrate knowledge of the wave nature of light by:

1. Describing how light can be separated into its different color components.
2. Defining wavelength and frequency.
3. Describing the relationship that exists between wavelength, frequency, and energy of electromagnetic radiation.

Competency 5: The student will demonstrate an ability to understand several of the intricacies of the periodic table by:

1. Distinguishing between periods and groups on the periodic table.
2. Relating the position on the periodic table to atomic number.
3. Using the structure of the periodic table to classify elements (e.g., metal, non-metal, metalloid, noble gas, representative element, transition element, inner transition element, alkali metal, alkaline earth metal, and/or halogen).
4. Relating the group number of elements to similarities in chemical properties.
5. Describing the properties of metals and non-metals and distinguish them according to their properties.

Competency 6: the student will demonstrate knowledge of basic separation techniques by:

1. Demonstrating the technique of distillation as a means to purify a liquid sample.
2. Demonstrating the technique of thin-layer chromatographic separation and analysis.

Competency 7: the student will demonstrate knowledge of the properties of solutions by:

1. Distinguishing between a solute and solvent in a solution.

2. Distinguishing between the different types of solutions: saturated, unsaturated, and supersaturated.
3. Demonstrating the effect of a solute on the freezing point of the solvent.
4. Demonstrating the effect that a solute has on the osmotic process by examining the flow of substances through a membrane.

Competency 8: the student will demonstrate knowledge of the properties of acids, bases, and salts by:

1. Defining ph.
2. Defining the terms acid and base in the context of the pH scale.
3. Applying the pH scale to find the acidity and basicity of common household substances.
4. Distinguishing between acids, bases, and salts among common household products.

Learning Outcomes:

- Communicate effectively using listening, speaking, reading, and writing skills
- Use quantitative analytical skills to evaluate and process numerical data
- Solve problems using critical and creative thinking and scientific reasoning