

North Hennepin Community College

CHEM 2073: Introduction to Instrumental Methods and Analysis

A. COURSE DESCRIPTION

Credits: 4

Lecture Hours/Week: *.*

Lab Hours/Week: *.*

OJT Hours/Week: *.*

Prerequisites:

This course requires all three of these prerequisites

CHEM 1061 - Principles of Chemistry I (Minimum grade: 1.67 GPA Equivalent)

CHEM 1062 - Principles of Chemistry II (Minimum grade: 1.67 GPA Equivalent)

CHEM 2061 - Organic Chemistry I (Minimum grade: 1.67 GPA Equivalent)

Corequisites: None

MnTC Goals: None

This course is intended to primarily provide students with an added advantage for employment while pursuing an education toward a career. The students would be taught the proper methods for solution and sample preparation, along with becoming familiar with state of the art instrumentation. They also would be exposed to safety and manufacturing practices that are important in chemical industry. This course aims at making a student versatile with laboratory techniques and would provide a student with an edge over other candidates in the job market for lab assistants' positions. (2 hours lecture, 6 hours lab)

Prerequisite: Chem 1061, 1062, and 2061

B. COURSE EFFECTIVE DATES: 01/14/2002 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Course content may include but is not limited to: Safety in the Workplace, MSDS sheets, hazardous material, Volumetric Glassware & Balances, Error Analysis & Statistics, Solution Preparation, Preparing samples for a particular instrument, Extraction techniques, Titrations, Beers Law and Applications, FTIR, NMR, GC, HPLC, MS, and open-ended experiments.

D. LEARNING OUTCOMES (General)

1. Work independently in a lab. (MnTC G3, comp. a, b, c, Certification Goal 1, ELO 1, 2)
2. Use current GLP in collecting lab data and conduct experiments safely. (MnTC G2, comps. a, c, Certification Goal 2, ELO 1, 2)
3. Acquire basic knowledge of the electronics and computer technology in instrumentation today. (MnTC Goal 3, comp.a, Certification goal 5, ELO 1, 2)
4. Design an experiment for a set of defined conditions. (MnTC Goal 2, comps. a, c; MnTC Goal 3, comps. a, b, c, Certification 3 & 4, ELO 1, 2, 3, 4)
5. Design parameters for an instrumental analysis. (MnTC Goal 2, comps. a, c; MnTC Goal 3, comps. a, b, c, Certification goal 3 & 6, ELO 1, 2, 3, 4)
6. Troubleshoot and rectify a problem with an instrument. (MnTC Goal 2, comps. a, c; MnTC Goal 3, comps. a, b, c, ELO 1, 2, 3, 4)
7. Interpret results of experiments. (MnTC Goal 2, comps. a, c; MnTC Goal 3, comps. a, b, c, Certification 3, ELO 1, 2, 4)
8. Have an understanding of the errors allowed for an instrument, the statistics of the data collected and presentation of the data with its relevance. (MnTC Goal 2, comps. a, c; MnTC Goal 3, comps. a, b, c, Certification 3, ELO 1, 2, 4)

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

1. Knowledge of Human Cultures and the Physical and Natural World --Through study in the sciences, mathematics, social sciences, humanities, histories, languages, the arts, technology and professions.
2. Intellectual and Practical Skills - Including: Inquiry and analysis; Critical and creative thinking; Written and oral communication; Quantitative literacy; Information literacy; Teamwork and problem solving.
3. Personal and Social Responsibility and Engagement - Including: Civic knowledge and involvement - campus, local and global; Intercultural knowledge and competence; Ethical reasoning and action; Foundations and skills for lifelong learning .
4. Integrative and Applied Learning - Including: Synthesis and advanced accomplishment across general education, liberal studies, specialized studies and activities in the broader campus community.