CENTER FOR INNOVATIVE TECHNOLOGIES MASTER
COURSE DOCUMENT

CMT 220 Analytical Chemistry

Course Description: A course on quantitative and qualitative chemical analysis with emphasis on wet chemical techniques. Topics include: sample preparation; volumetric, gravimetric, electrochemical, and separation methods; and statistical treatment of data.

Prerequisites(s): CMT 112, CHE 122, and CHE 132 **Corequisite(s):** No corequisite

Lecture Hours: 3	Lab Hours: 3	Credit Hours: 4
Lab Fee: 105	Supplemental Fee: 0	Purpose:
☐ Transfer Assurance Guide Course (TAG)	☐ Transfer Module Course (TM)	
Course Format: Lec/Lab	Grading: A/B/C/D/F/I	
Delivery Method: □ Web	□ Hybrid	☒ Classroom
Semesters Offered: ☒ Fall	□ Spring	□ Summer

Course Primary Text:

Title: Quantitative Chemical Analysis	Edition: 9th
Author(s): Harris	
Publisher: Freeman	

Supplemental Materials:

Program Outcomes:

1	Students will determine and demonstrate safe lab practices and use of lab safety resources.
2	Students will utilize basic laboratory equipment and techniques.
3	Students will effectively utilize lab tools in accurate /precise solution preparation.
4	Students will apply a variety of lab calculations common in chemical analysis.
5	Students will be able to compile and evaluate experimental data.

Course Outcomes:

1	Understand safe lab practices and use of lab safety resources

2	Understand role of quality assurance in analytical labs
3	Be familiar with properties of common lab reagents
4	Be proficient in the use of key chemical information references/resources
5	Effectively utilize lab tools in accurate/precise solution preparation
6	Be proficient in variety of lab calculations common in analytical analyses
7	Understand types and sources of experimental error
8	Successfully apply common statistical methods to analytical data
9	Be able to use various types of calibration methods for analyte quantitation
10	Understand and apply knowledge of chemical equilibria to analytical methods

11	Thoroughly understand and successfully perform various types of titrations
12	Demonstrate knowledge of gravimetric, precipitation, and combustion analyses
13	Demonstrate knowledge of common electro-analytical methods
14	Understand theory of analytical separations and common applications
15	Have working knowledge of UV/visible spectroscopy

Course Topics:

Week 1	Introduction to analytical chemistry, industrial safety, and quality assurance
Week 2	Laboratory measurements and calculations
Week 3	Experimental error
Week 4	Statistics
Week 5	Calibration techniques
Week 6	Chemical equilibrium
Week 7	Acid-base equilibrium
Week 8	Acid-base equilibrium
Week 9	Electro-analytical techniques
Week 10	Gravimetric, precipitation, and combustion analyses
Week 11	Analytical separations theory
Week 12	Separation techniques
Week 13	Introduction to spectroscopy
Week 14	Introduction to instrumental analysis
Week 15	Review, lab practical exam, and final exam

Methods of Evaluation/Assessment

□ Formative: ☒ Summative

List assessment activities (e.g. quizzes, discussions, essays, research papers, debates, oral presentations, exams):

Homework assignments
Quizzes
Lab reports
Final exam
Final lab practical exam

Course Keeper: Ann Fallon Date Completed: 7/14/20