Instructor:  Charles Cao (cao@chem.ufl.edu), 226 Leigh Hall.

TA:  Tianyuan Xiao (tyxiao@chem.ufl.edu), Phone: 352-214-8436

Lectures:  M, W, F, 6th Period (12:50 pm to 1:40 pm), 210 CBD

Office hours:  By appointments

Website:  on E-learning (Canvas)

Requirement:  Strong background in calculus and thermodynamics

Textbook:  Unified Separation Science by J. Calvin Giddings
           (John Wiley & Sons, INC)

Reference:  The Essence of Chromatography by Colin Poole (Elsevier)

Themes:  1. Fundamentals of Separation Science
         2. Gas Chromatography
         3. Liquid Chromatography
         4. Other Analytical Separation Techniques

Homework:  Problems will be assigned throughout the semester as an aid in
            comprehending the course material. They will not be graded. Answers to
            the assigned problems will be discussed in the class.

Quiz and Exams:  Four quizzes will be given throughout the semester as an aid to
            review the course material periodically. Two exams will be included in the
            course. The midterm exam covers the first and second part of the themes, and it
            will be a 2-hour exam during October. The final one is a comprehensive exam,
            but it will emphasize the last two parts of the themes.

Research Presentation & Proposal:  Research-oriented study on a specific
            topic related to separation science. Suggested topics are listed below (note that
            student can also suggest a topic of his/her own interest with the approval of the
            instructor). This study includes (1) a thorough review of the current state of art
            on the research related to the chosen topic, (2) a new and novel solution from the
            student, and (3) student should defend that his/her solution is able to be
            evaluated by proposed experiments. The results from the study will be shown as
            a 20-min presentation on November 19. In addition, this presentation will be
            further shown in a written-form proposal. The length of the proposal is about
            1800 words. The final due date for the printout proposal: December 8, and no
            score will be given for a late submission.
The topics of research projects for choice:
1. Diagnosis of Ebola infections
2. Diagnosis of Zika-virus infections
3. Quantitative detection of a cytokine in blood samples
4. An in-vivo device for monitoring soldiers’ potential exposure to chemical and biological warfare agents in military operations.
5. Rapid detection of HIV in blood samples
6. Quantitative detection of Hg in fish
7. Detection of prostate cancer
8. Detection of single-nucleotide in a single human cell
9. Real-time measurement of the level of a specific m-RNA in single cells
10. Whole-genome sequencing of a human fetus using a blood sample of the mother
11. Isolation and transplantation of Genome of individual bacterium
12. Rapid detection of 24-hour Urine samples

Grading:

Homework:.................................0 points
4 Quizzes.................................20 points (5 points for each)
Midterm Exam:.............................80 points
Final Exam:.................................100 points
Research Presentation & Proposal:....100 points