CHM 4130 INSTRUMENTAL ANALYSIS
Fall 2016 M, W, F LEI 0104 2nd Period (8:35- 10:25 am)

INSTRUCTOR: Dr. Anna Brajter-Toth; atoth@chem.ufl.edu
Office hours: TBA S228A

TEACHING ASSISTANT: TBA
Office hours: TBA

OBJECTIVES:

1. To become familiar with the physical and chemical fundamentals behind major analytical instrumental techniques and understand what it is that analytical chemists do and why.
2. To understand and correctly use the terminology of the field.
3. To understand the principles of instrumental design and to be able to correctly identify instrumental components.
4. To understand and predict applications of different analytical instrumental techniques.
5. To understand basics of data analysis from major analytical techniques.
6. To understand the basics of electronics.
7. To understand limitations and advantages of different techniques.

DESCRIPTION : This is a lecture course. Practical part of this course is CHM 4130L, which can be taken simultaneously or after CHM 4130 class. Hand outs and on-line resources will be used in class as needed. **Attendance in class is required**. Lectures will not follow the textbook exactly. However, all the information conveyed in class is in the textbook(s). For success in this class you have to **take notes in class**, review the notes, and look for clarification of the notes in the textbook as needed. To study, it helps to read the text book while studying the notes. Homework problems will be assigned throughout the semester as an aid in comprehending the material and will be posted on CANVAS. Many of the problems will from the textbook, which means you can easily find the answers. Only some will be graded, and others will be practice problems (not graded). You will be responsible for all the material covered in class and in the assigned problems.

TEXT: "Principles of Instrumental Analysis", **Skoog, Holler and Crouch (6th Ed, Thomson)** or **Skoog, Holler and Nieman.**

EXAMS: There will be three in-class exams during the semester as well as a comprehensive final. The exams will cover the material covered in class. When studying, do not memorize the notes but focus in your work on understanding the material.

Exam I:	F Sept 23, in class
Exam II:	F Oct 21, in class
Exam III:	F Nov 18, in class
Final:	M Dec 12, 10:00- 12:00 am, FLI 0119

All exams are worth 300 points. If you have a perfect attendance record- attendance in class is required- 3 best out of four exams scores count toward the final grade, and homework points are bonus points. If you have more than 1 unexcused absence you are required to take all four exams, with all points averaged for the final grade, and you will forfeit the HW bonus points.

APPROXIMATE GRADING SCALE:

>85%	A; 81% A-
75%	B; 78% B+; 70% B-
60%	C; 65% C+; 57% C-
50%	D; 54% D+

Note: In the borderline cases HWK submission and class attendance will be considered.

LECTURE LIST, with **approximate** timetable.

Date	Topic	
Aug 22 M	Introduction	Chapter 1
Aug 24 W	Electrical Components and Basics of Circuits	Chapter 2
Aug 26 F	Operational Amplifiers	Chapter 3
Aug 29 M	Sensitivity, LOD	Chapter 5
Aug 31 W	Signal-to-Noise	Chapter 5
Sep 2 F	Spectroscopy Methods Intro	Chapter 6
Sep 5 M	**LABOR DAY HOLIDAY- NO CLASS**	
Sep 7 W	Molecular Spectroscopy UV/Vis	Chapter 7
Sep 9 F	Molecular Spectroscopy UV/Vis	Chapter 7
Sep 12 M	UV/Vis	Chapter 13
Sep 14 W	Analysis with UV/Vis	Chapter 14
Sep 16 F	Infrared (IR)	Chapter 16
Sep 19 M	Infrared (IR)	Chapter 16
Sep 21 W	IR	Chapter 16
Sept 23 F	**EXAM I (Chapters 1-7, 13, 14, 16)**	
Sep 26 M	IR Instrumentation	Chapter 7
Sep 28 W	Raman	Chapter 18
Sep 30 F	Raman	Chapter 18
Oct 3 M	Molecular Luminescence Spectroscopy	Chapter 15
Oct 5 W	Luminescence	Chapter 15
Oct 7 F	Atomic Spectroscopy	Chapter 15
Oct 10 M	Atomic Spectroscopy	Chapter 8
Oct 12 W	Atomic Spectroscopy	Chapter 9
Oct 14 F	**HOMECOMING HOLIDAY-NO CLASS** ***HAVE FUN***	
Oct 17 M	Atomic Spectroscopy	Chapter 9
Oct 19 W	Mass Spectrometry (MS)	Chapter 20
Oct 21 F	**EXAM II (Chapters 7-10, 15, 18)**	
Oct 24 M	MS	Chapter 20
Oct 26 W	MS	Chapter 20
Oct 28 F	MS	Chapter 20
Oct 31 M	Electroanalytical (EC) Methods	Chapter 22

Nov 2 W	EC Methods	Chapter 22
Nov 4 F	EC Methods	Chapter 23
Nov 7 M	EC Methods	Chapter 25
Nov 9 W	Separations Introduction	Chapter 25
Nov 11 F	**VETERANS DAY HOLIDAY- NO CLASSES**	
Nov 14 M	Separations	Chapter 26
Nov 16 W	Liquid Chromatography (LC)	Chapter 30
Nov 18 F	**EXAM III (Chapters 20, 22, 23, 25, 26, 28)**	
Nov 21 M	LC	Chapter 30
Nov 23 W	**THANKSGIVING HOLIDAY- NO CLASSES**	
Nov 25 F	**THANKSGIVING HOLIDAY- NO CLASSES**	
Nov 28 M	LC	Chapter 30
Nov 30 W	LC	Chapter 30
Dec 2 F	GC	Chapter 30
Dec 5 M	GC	Chapter 27
Dec 7 W	Review	
Dec 12 M	**Final Exam 10:00-12:00 AM COMPREHENSIVE**	

PLEASE NOTE: Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.