CHEM 5570 Graduate Analytical Core: 3 hours. The goal of this course is to emphasize the instrumental and theory of instrumentation within the field of analytical chemistry. The topics of the course include statistical treatment of data, electronics, chemical equilibrium, mass spectrometry, spectroscopy, and general instrumental analysis. (Notice: CHEM 5570 requires extensive calculations, and requires the background to perform such calculations)

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Class Schedule: MWF 9:00-9:50, Chemistry 253
Office Hours: Monday, Wednesday: 8:00-9:00am HH 004

Introduction to Instrumentation
August
23- Introduction to Analytical Instrumentation
30- Design and Fabrication/ Basic Electronics and Vacuum

September
8- Basic Stats/ Advanced Stats and Data Collection

Spectroscopy
September
13- Introduction to Optics; Optics and Symmetry
20- Symmetry and Introduction to Spectroscopy
27- Rotational Spectroscopy; Vibrational Spectroscopy

October
4- Electronic Spectroscopy; Photoelectron and Laser Spectroscopy

Separations
October
11 Introduction to Separations
18 Ion Exchange Chromatography
25 Gas Chromatography/ Liquid Chromatography

November
1 Electrophoresis/ Microfluidics

Mass Spectrometry
November
8- Introduction to Mass Spectrometry and Ion Optics
15- Time-of-Flight; Sector and Quadrupole Mass Selectors
22- Penning and Paul Ion Traps
29- Ion Sources (MALDI, FAB, ESI, EI,Cl) and Detector
Required Readings:


Suggested Readings **


**Note:** The Suggested Readings will be on hold at the library and in my office.
Tests and Quizzes:

4 Tests will be given at announced times for 100 pts. each. Each Test will be an Out-of-Class Exam, due at the beginning of class exactly one week after delivery. Late exams will not be accepted!

Grading:

The course grade is the sum of the exams out of 300 total points.

Grading Scale:

<table>
<thead>
<tr>
<th>Final percent Average</th>
<th>Letter Grade</th>
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</thead>
<tbody>
<tr>
<td>90.0 – 100.0 %</td>
<td>A</td>
</tr>
<tr>
<td>80.0 - 89.0 %</td>
<td>B</td>
</tr>
<tr>
<td>70.0 - 79.0 %</td>
<td>C</td>
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<tr>
<td>60.0 - 69.0 %</td>
<td>D</td>
</tr>
<tr>
<td>Below 60.0 %</td>
<td>F</td>
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</tbody>
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Attendance Policy:

Class attendance is highly recommended and will be monitored periodically. Students who miss the class are responsible for all the missed class materials that may not be addressed by the instructor in a subsequent class.

Note:

I reserve the right to make changes/modifications of the syllabus if needed.

Additional Information:

1. According to University policy, the grade of I (incomplete) cannot be given as a substitute for a failing grade in a course.

2. Statement of ADA Compliance: The chemistry department cooperates with the Office of Disability Accommodations to make reasonable accommodations for qualified students with disabilities. If applicable, please present your request along with an official written verification from the ODA before the end of the first week of classes.