

**Chemistry 4015/6015**  
**Separation in Biosciences Spring 2012 (MM1)**  
**Class Room South 230 ( Wed 1:00-3:45, Lectures)**  
**Room 576 (1:30-4:30, Laboratory)**

**Instructor:** Office: Shahab A. Shamsi, Room 573 NSC,  
 Phone (404)-413-5512; E-mail address: sshamsi@gsu.edu  
 Monday and Wednesday  
 Office Hours (immediately after the class, or TBA by appointment)

**Reference text and resources:** (1) Lecture notes (to be provided in class);  
 (2) Reference book (to be available in the library reserve)

**Course Objective:** \*To learn fundamentals of capillary electrophoresis  
 \*To develop basic skills in operating capillary electrophoresis instruments  
 \* To learn basic principles of various modes of capillary electrophoresis  
 \*To learn to apply basic principles in order to develop a capillary electrophoresis method to achieve a particular separation/analysis of compounds or mixtures of compounds  
 \*To improve oral communication skills in scientific reading and data presentations

**Tentative Lecture Content: (This schedule is a general guide and may be modified as needed)**

**Unit 1-The Basics of Capillary Electrophoresis (Total 2 lectures +1 laboratory)**

<b>Date</b>	<b>Reading</b>	<b>Module sub-topic</b>
		<b>Module 1</b>
Jan 9	Lecture Notes Reference books Module 1	Introduction and History of Capillary Electrophoresis (CE) Classification of CE Methods Basic Separation Mechanism and Fundamentals of CE Electroosmotic flow and how it is generated Concept of Effective and Apparent Mobility Efficiency and Resolution in CE (contd) Sources of Zone Broadening
		<b>Module 2</b>
	Reference books Lecture Notes Module 2	Capillary Electrophoresis (CE) Instrumentation Capillary Electrophoresis Method Development
Jan 11	Lecture Notes	Detection in CE, Capillary Zone Electrophoresis (CZE) Introduction, Mechanism of Separation, Buffer Systems Practical Considerations in CZE

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**Jan 16**      **Martin Luther King Holiday (No Class)**



#### Unit 4-Advances in Separation/Detection in Capillary Electrophoresis (Total 1 lecture)

<u>Date</u>	<u>Reading</u>	<u>Module sub-topic (1-lecture)</u>
Feb 8	Lecture Notes Reference books	<b>Module 7 (contd) and Module 8</b> CCE (contd) Capillary Electrochromatography (CEC) Fundamentals and Instrumentation in CEC Mechanism of Separation, Buffer Systems, Applications
	Lecture Notes Reference books	<b>Module 9</b> Capillary Electrophoresis-Mass Spectrometry, CEC-MS, MEKC-MS, Capillary Array Electrophoresis <i>(Lab report #2 is due)</i>
<b>Feb 13</b>	<b>Exam II (Unit 3 + Lab 2)</b>	

#### Unit 5-Group Presentations

Feb 15 (three students)	Each 30 Min Session + 5 min Q&A
Feb 15 (two students)	Each 30 Min Session + 5 min Q &A
Feb-20 (three students)	Each 30 Min Session + 5 min Q &A
Feb-20 (two students)	Each 30 Min Session + 5 min Q &A

**Exam III Wednesday Feb 22 Based on Unit 5 (only) (Take Home depending on Class Vote)**

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**Final Exam Friday Feb 24 at 1:30-4:00 P.M (Comprehensive)**

#### **\*Homework Problems:**

Assigned problems will also be given during the course of the semester. *These will not be graded nor turned in.* It will be up to the students to complete these homework assignments. However, it should be noted that the *some of questions appearing on exams will be based on questions taken from homework.*

#### **GRADING CRITERIA**

##### **UNDERGRADUATE(4015)**

Short exams 50%  
(Exam 1 = 15%, Exam 2 = 20%)  
Exam 3 = 15%)  
Lab Report = 15%  
\*Final exam 25%  
Presentations 10%

##### **\*GRADUATE (6015)**

Short exams 50%  
(Exam 1 = 15%, Exam 2 = 20%  
Exam 3 = 15%)  
Lab Report 10%  
\*Final exam 25%  
Presentations (class participation)  
15%

**\*Final exam will be 75% comprehensive and 25% will cover part of Model 7-9**

**\*Student can take at least two final exams within 24 hours. However, if a student has more than two exams please let me know in writing at least 7 days before the final to reschedule. No special administration of final exams will be made if the above rule is not followed.**

**GRADING SCALE:** The grading scale may be curved, but the most probable breakdown will be:

95-100	A <sup>+</sup>
90-94	A
85-89	A <sup>-</sup>
80-84	B <sup>+</sup>
75-79	B
70-74	B <sup>-</sup>
65-69	C <sup>+</sup>
60-64	C
55-59	C <sup>-</sup>
50-54	D <sup>+</sup>
45-49	D
40-44	D <sup>-</sup>
below 40	F

**PLEASE READ THE IMPORTANT POLICIES AND PROCEDURES:**

1. **No makeup exams will be given** (unless the situation is such that the whole class did poorly in the exam).
2. If a student misses one exam **without a legitimate excuse**, s(he) will receive a grade zero for that exam.
3. If a student misses one exam **with a legitimate excuse**, s(he) can either choose to receive a grade of zero for that exam or apply the grade to the final exam.
4. If you miss exam III there (with or without legitimate excuse) you will receive grade zero on that exam

\*Legitimate reasons for excuse are the following:

<b>Cause</b>	<b>Required</b>
Due to illness	illness note from the doctor
Due to business	business note from the supervisor
Death in family	note of death from a family member
Other	On a case by case basis

\* I must be informed **before the exam** to count as an excused absence. If you cannot reach me, leave a message on my answering machine at my office (Indicate the time and the day), or notify the departmental receptionist (Indicate the time and the day).

**Please note that notifying me after the exam will result in a grade of zero for that exam.**

5. Although I do not expect cheating in my classroom, the penalty is an **F for the course**. Plagiarism is also considered cheating, therefore, copying large sections of another author's material without paraphrasing and referencing it will result in grade F.
6. Attendance will be taken regularly. I strongly urge to attend class. Otherwise you may miss the pop quizzes and lecture part (that may not be there in your textbook).

7. Although I will try to maintain the class schedule and objectives, I may need to make adjustments.

### **Course Withdrawl Date**

The last day to withdraw from the course and possibly receive a “W” is **Friday Jan 27**

### **Professional Behavior Guidelines:**

1. **Tardiness:** Please arrive on time. If you are late please enter the class without disturbing your class mates and my concentration.
2. **Side Conversation:** Side conversations make it difficult for your class mates to actively listen and learn. If you have trouble reading the board please ask me without any hesitation.
3. **Sleeping:** Falling asleep in class (unless the course focuses on dysfunctional sleep behaviors) is not considered professional attitude.
4. **Lack of attention/Boredom:** Please do not read other books or newspapers or study for other courses during my class. It is not polite. If the material that you are taught is familiar to you please write down some specific questions in your notebook and discuss with me about the advances in this topic (**only after the class**).
5. If you cannot see me during my office hours please send me an e-mail (chegas@langate.gsu.edu) for help any day.
6. You may audio tape my lectures.