

CHM 618  
Theory of Separations  
Fall 2006

Instructor: Jaycoda Major (Jay)  
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Lectures: Tuesday 5:00 – 7:30pm

Office hours: Stop by anytime (unless my inner door is closed) or e-mail. Good luck calling!!!

Course description: an advanced course studying the theory, instrumentation and application of chemical separations. We will look at both liquid chromatography, gas chromatography, electroseparations and, time permitting  $\mu$ -TAS this semester. We will also discuss advances in techniques.

Text: I haven't chosen a required text, but I can suggest a few if you feel like you really need one. You might have reading assignments from the literature.

Grading:

Homework and assignments	15%
In-class exams (2 @ 25% each)	50%
Final exam	35%

Some topics to be covered. Depending on time, more may be added as appropriate or based on interest.

Fundamentals/theoretical aspects of separation

Instrumentation: pumps, injectors, detectors, etc.

Column technology: particulate columns, bonded phase, monolithic columns, etc.

Column testing

Liquid chromatography:

- (a) adsorption chromatography
- (b) partition chromatography – reversed phase
- (c) Ion chromatography – ion exchange, ion-pairing
- (d) Affinity chromatography
- (e) Size exclusion chromatography/GPC
- (f) Chiral chromatography
- (g) Preparative chromatography (maybe)
- (h) Micro and capillary systems

Gas chromatography

Electroseparation:

- (a) CE/CZE
- (b) CEC

Miniaturized systems:

- microfluidics, lab-on-a-chip

I expect you to work independently on assignments **AND** exams. Cheating will not be tolerated. Good healthy discussion is acceptable, but the work you turn in should represent your individual effort. That is your answers should not be verbatim to another student's.