



CHEM 5385 – Chromatographic Separations – Spring 2018

INSTRUCTOR:	Dr. Tarek M. Trad	OFFICE:	CFS 317J
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TIME AND LOCATION

Chromatographic Separations – CHEM5385 – 01: MWF 09:00 am – 09:50 am, Chemistry and Forensic Science Building (CFS), room 101

OFFICE HOURS

MWF 2:00 pm – 3:40 pm

Other times by appointment or on “walk in” basis

REQUIRED MATERIALS

- Lecture notes will be provided by the instructor.
- Suggested reference textbooks:
 - Exploring Chemical Analysis, 5th edition, by Daniel C. Harris. *Publisher:* Freeman Publishers.
 - Fundamentals of Analytical Chemistry, 9th edition, by Skoog and West. *Publisher:* Brooks/Cole and Cengage Learning.
 - Peer-reviewed scientific literature.
- Scientific calculator: Texas Instruments model TI-30 or similar.

COURSE DESCRIPTION

This course is adaptable to the needs and interests of the individual graduate student majoring in Chemistry. Modern developments in specific subdivisions of the field of chemistry are considered. It may be repeated for credit, provided the repetition is not in the same subdivisional field. The subdivisional fields offered are: analytical, biochemistry, environmental, inorganic, organic, and physical chemistry. This course will focus on separation science and theory. In addition, a comprehensive discussion over several chromatographic methods of separation including gas chromatography, liquid chromatography, and Electrophoresis will be provided.

Prerequisite: Graduate standing in Chemistry. Credit 3.

LEARNING OUTCOMES

Successful completion of this course is expected to provide students with the following outcomes:

- Ability to use peer-reviewed scientific literature as a tool in their field.
- Comprehensive understanding of separation science theory and application.
- Theoretical understanding of the design and operation of discussed chromatographic separation methods.
- Relate the science of environmental and forensic chemistry to the student’s physical environment of work, study, and recreation.

GRADING SYSTEM

- *Midterm Exams (60% of your overall grade):* There will be three major midterm exams plus a comprehensive final.
- *Final (24% of your overall grade):* The **Final Exam is comprehensive** and will be given during finals week.
- *Quizzes (16% of your overall grade):* Quizzes will be assigned during the semester. You are expected to read the assigned articles and notes to be able to work through the quizzes. Solving problems will

help you strengthen your understanding of the material. **If you fail to take a quiz or don't show up on the date of a quiz, you will receive zero points.**

- Your overall grade will be determined based on the following point system:
 - Quizzes (4 @ 20 points each) 80
 - Tests (3 @ 100 points each) 300
 - Final 120

Total possible points: 500

<i>RANGE</i>	<i>LETTER GRADE</i>
450.0 – 500.0	A
400.0 – 449.5	B
350.0 – 399.5	C
300.0 – 349.5	D
0 – 299.5	F

- I reserve the right to extend the cutoff percentages lower (but I will **NOT** raise them).

CLASS POLICIES

- Cell Phones:* As cell phones are disruptions to the learning environment, these must be silenced during lectures and tests.
- Attendance:* It is the student's responsibility to obtain any material from missed classes. Attendance in class is mandatory, but I strongly encourage students not to miss class. Attendance during exams is required, unless prior arrangements are made. No make-up exams will be given. Excused absences on exams must be pre-approved.

OTHER COURSE POLICIES

- Accommodation for students with disabilities:* It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.
- SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Services for Students with Disabilities and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential. NOTE: No accommodation can be made until you register with the Services for Students with Disabilities.
- Collaboration:* In general I encourage you to work with others. Collaboration will enable you to get much more out of the class than if you work alone. Specifically I would encourage you to work with others to prepare for exams and assignments and lectures. However, your work must be your own. It is a violation of class policy to use somebody else's answers as your own. No collaboration is allowed during exams.
- Policy on cell phones and electronic devices:*
Lectures: With the exception of approved graphing calculators and wrist watches, no other electronics (for example cell phones and computers) are allowed during lecture, unless the user has requested and

received permission from the instructor to use a specific device. The first violation of this policy will be met with a warning. If there are subsequent violations, the student may be asked to move to the back row of the classroom, or to leave; the lecture will pause until this has been accomplished.

- *Exams:* On exams, the visible presence of a cell phone, earbuds or other electronic device (except approved calculators and watches) is not allowed and will be penalized. Exceptions will be granted to individuals who have requested and received permission to use a specific device from the instructor.

SHSU POLICY STATEMENTS

The **Sam Houston State University Policies** on (1) Academic Dishonesty, (2) **Student Absences on Religious Holy Days**, (3) **Students with Disabilities**, and (4) **Classroom Visitors** are each designed to strengthen community and learning and are fully applicable in this course. You are encouraged to review a summary of these important policies online at <http://www.shsu.edu/syllabus/>

Additional context and details on all of these policies are available on the following web page:

<http://www.shsu.edu/dept/academic-affairs/aps/aps-students.html>

TENTATIVE COURSE OUTLINE AND ACTIVITIES:

- Topics are taken from suggested textbooks and assigned journal articles.
- Instructor may alter the schedule as the course proceeds.

TOPIC 1	Introduction to Analytical Separations
TOPIC 2	Gas Chromatography
TOPIC 3	Liquid Chromatography High Performance Liquid Chromatography EXAM I – Monday, February 19
TOPIC 4	Supercritical Fluid Separations
TOPIC 5	Capillary Electrophoresis EXAM II – Friday, March 26
TOPIC 6	Novel Gas Chromatographic Detectors: Photoionization Detector
TOPIC 7	Novel Gas Chromatographic Detectors: Flame Photometric Detector
TOPIC 8	Novel Gas Chromatographic Detectors: Atomic Emission Detector EXAM III – Monday, April 23
TOPIC 9	Two-dimensional Gas Chromatography (If time allows)
FINAL	Wednesday, May 09, 09:30 pm – 11:30 pm

For information on drop/register dates, and other important dates, please visit the Academic Calendar page on the SHSU website.