

ADVANCED ANALYTICAL CHEMISTRY - CHEM 5316

The University of Texas at Tyler

Spring, 2021

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Office Hours:

T, R : 11:00 am-12:00 pm

M,W,F: 11:15am to 12:15 pm.

Open door policies.

DESCRIPTION: A survey of selected principles and techniques of modern analytical chemistry with a focus on major areas including spectroscopy, separations sciences, and electroanalytical chemistry.

Important Covid-19 Information for Classrooms and Laboratories

- **First week of classes (January 11-16): All classes will be taught online.**
- **Second week of classes (January 18-23): All classes, except for laboratories will be taught online.**
- **Remainder of the semester (January 25-April 30): All face-to-face and hybrid classes will resume their original instruction mode.**

Students are required to wear face masks covering their nose and mouth, and follow social distancing guidelines, at all times in public settings (including classrooms and laboratories), as specified by Procedures for Spring 2021 Return to Normal Operations. The UT Tyler community of Patriots views adoption of these practices consistent with its Honor Code and a sign of good citizenship and respectful care of fellow classmates, faculty, and staff.

Students who are feeling ill or experiencing symptoms such as sneezing, coughing, or a higher than normal temperature will be excused from class and should stay at home and may join the class remotely. Students who have difficulty adhering to the Covid-19 safety policies for health reasons are also encouraged to join the class remotely. Students needing additional accommodations may contact the Office of Student Accessibility and Resources at University Center 3150, or call (903) 566-7079 or email saroffice@uttyler.edu.

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in this course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in this course unless appropriate consent is obtained from all relevant students. Class recordings are reserved only for the use of students enrolled in the course and only for educational purposes. Course recordings should not be shared outside of the course in any form without express permission.

STUDENT LEARNING OUTCOMES:

By the end of the course students will be able to:

1. Assess and address the germane challenges associated with a particular analysis;
2. Select an appropriate method or methods to solve a chemical problem;
3. Demonstrate the understanding of modern chemical instrumentation theory

SUGGESTED REFERENCES AND READING MATERIALS:

- Laboratory Techniques in Electroanalytical Chemistry by P. Kissinger and W. Heineman, 1984, Marcel Dekker, Inc.
- Unified Separation Science by J. Calvin Giddings, 1991, John Wiley & Sons, Inc.
- Principles of Instrumental Analysis, 7th edition by Skoog, Holler & Nieman, Saunders College Publishers.
- Assigned articles and papers from different sources that will be announced:
Analytical chemistry ACS publications
J. Chromatography A
J. Chromatography B
J. Chromatographia
J. Separation Science
J. Agri. Food Chem.
Talanta
Langmuir
Journal of Analytical Chemistry, Springer Science & Business Media B.V.
International Journal of Analytical Chemistry, Hindawi Publishing Corporation
American Journal of Analytical Chemistry Spectroscopy EPSCO
International Journal of Spectroscopy, etc.

OTHER REQUIRED MATERIALS:

1. High-speed Internet connection
2. Webcam (internal or external)
3. Windows, Mac, or Chrome Operating System
4. Up-to-date Chrome or Firefox browser

EVALUATION: Your grade in this course is determined by your performance on several exams that assess what you have learned in the lecture as well as your ability to evaluate and solve chemical problems. Each graded assignment is listed below along with its weight.

<u>Total: 500 points</u>	1.	Two exams worth 100 points each;
	2.	Research paper and class presentation 100 points each
	3.	Final exam worth 100 points

The total number of points you attained on all graded work determines your final grade.

Grade	%
A	90 - 100
B	80 - 89
C	70 - 79
D	60 - 69
F	below 59

Research Paper and Class Presentation: Each student will complete 7-10 page research paper and class presentation on an advanced topic in Analytical Chemistry. The topic of your paper should be selected no later than **January 25th** and should be approved by the Instructor. Electronic copy along with the hard copy should be submitted at the same time on the due date. Each student will give an oral presentation on his (her) paper.

IMPORTANT DATES:

January 18–Martin Luther King, Jr. Holiday, all offices closed, no classes

January 25– Last day to withdraw without penalty (census date).

March 8 –13 Spring break, no classes

March 29 (Monday) – Last day to withdraw from the course with a “W”

April 26 (Monday) –Study Day

TBD - Final Exam

POLICIES: My expectation is that you will attend all classes unless directed otherwise. There will be regularly assigned readings and occasional problem sets. None of these assignments are graded; they are for your benefit only. In addition, I will assign articles for you to read. We will discuss these readings and during class, and I will expect you to participate. These assignments are the minimum I believe is necessary for an average student to understand the subject material. **If you are unable to attend a class, it is your responsibility to determine all material discussed and assignments given.**

You will be allowed to make up a missed exam with an excused absence. Normally, these reasons would include medical emergencies, a death in your family or required travel for an UT at Tyler’s event (e.g., athletic team travel). If possible, please let me know ahead of time if you are not able to take an exam at its scheduled time so that another time for you to take it can be arranged. If the absence is not excused, you will receive zero points for the exam.

SMART DEVICES POLICIES: Cell phones, smart watches, and any similar electronic devices must **be turned off and put away** during exams. If they are observed out in a visually accessible place (*i.e.* between legs, on the floor, *etc.*), it will be assumed that they are being used to cheat; your exam will be taken away, you will receive a zero score (0 points) for the test, and you will be referred to the Office of Judicial Affairs.

STUDENT ACADEMIC CONDUCT:

While students are encouraged to study and prepare for examinations with other students, each student must work alone and neither give nor receive help from any sources when taking exams. ***Under NO circumstances will cheating be tolerated!*** University regulations are very explicit about academic dishonesty and these regulations will be strictly enforced. **The minimum penalty for cheating is a zero for the exam;** the maximum penalties, up to expulsion from the university, will be pursued in extreme or repeat cases. Students are expected to help enforce this policy and are encouraged to obtain a copy of *A Student’s Guide to Conduct and Discipline at UT Tyler*, available in the Office of Student Affairs.

UNIVERSITY POLICIES

UT Tyler Honor Code: Every member of the UT Tyler community joins together to embrace: Honor and integrity that will not allow me to lie, cheat, or steal, nor to accept the actions of those who do.

Students Rights and Responsibilities

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: <http://www.uttyler.edu/wellness/rightsresponsibilities.php>.

Campus Carry

We respect the right and privacy of students 21 and over who are duly licensed to carry concealed weapons in this class. License holders are expected to behave responsibly and keep a handgun secure and concealed. More information is available at <http://www.uttyler.edu/about/campus-carry/index.php>

UT Tyler a Tobacco-Free University

All forms of tobacco will not be permitted on the UT Tyler main campus, branch campuses, and any property owned by UT Tyler. This applies to all members of the University community, including students, faculty, staff, University affiliates, contractors, and visitors. Forms of tobacco not permitted include cigarettes, cigars, pipes, water pipes (hookah), bidis, kreteks, electronic cigarettes, smokeless tobacco, snuff, chewing tobacco, and all other tobacco products. There are several cessation programs available to students looking to quit smoking, including counseling and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grade Replacement

Students repeating a course for grade forgiveness (grade replacement) must file a Grade Replacement Contract with the Enrollment Services Center (ADM 230) on or before the Census Date of the semester in which the course will be repeated. Grade Replacement Contracts are available in the Enrollment Services Center or at <http://www.uttyler.edu/registrar>. Census Date can be found on the Syllabus, on the Academic Calendar, or in the information pamphlets published each semester by the Office of the Registrar. Failure to file a Grade Replacement Contract will result in both the original and repeated grade being used to calculate your overall grade point average. Undergraduates are eligible to exercise grade replacement for only three course repeats during their career at UT Tyler; graduates are eligible for two grade replacements. Full policy details are printed on each Grade Replacement Contract. The Census Date is the deadline for many forms and enrollment actions of which students need to be aware. These include:

- Submitting Grade Replacement Contracts, Transient Forms, requests to withhold directory information, approvals for taking courses as Audit, Pass/Fail or Credit/No Credit.
- Receiving 100% refunds for partial withdrawals. (There is no refund for these after the Census Date)
- Schedule adjustments (section changes, adding a new class, dropping without a “W” grade)
- Being reinstated or re-enrolled in classes after being dropped for non-payment
- Completing the process for tuition exemptions or waivers through Financial Aid.

State-Mandated Course Drop Policy

Texas law prohibits a student who began college for the first time in Fall 2007 or thereafter from dropping more than six courses during their entire undergraduate career. This includes courses dropped at another 2-year or 4-year Texas public college or university. For purposes of this rule, a dropped course is any course that is dropped after the census date (See Academic Calendar for the specific date). Exceptions to the 6-drop rule may be found in the catalog. Petitions for exemptions must be submitted to the Enrollment Services Center and must be accompanied by documentation of the extenuating circumstance. Please contact the Enrollment Services Center if you have any questions.

Disability/Accessibility Services

In accordance with Section 504 of the Rehabilitation Act, Americans with Disabilities Act (ADA) and the ADA Amendments Act (ADAAA) the University of Texas at Tyler offers accommodations to students with learning, physical and/or psychological disabilities. If you have a disability, including a non-visible diagnosis such as a learning disorder, chronic illness, TBI, PTSD, ADHD, or you have a history of modifications or accommodations in a previous educational environment, you are encouraged to visit <https://hood.accessiblelearning.com/UTTyler> and fill out the New Student application. The Student Accessibility and Resources (SAR) office will contact you when your application has been submitted and an appointment with Cynthia Lowery, Assistant Director of Student Services/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <http://www.uttyler.edu/disabilityservices>, the SAR office located in the University Center, # 3150 or call 903.566.7079.

Student Absence due to Religious Observance

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor of such absences by the second class meeting of the semester.

Student Absence for University-Sponsored Events and Activities

Revised 01/18 If you intend to be absent for a university-sponsored event or activity, you (or the event ponsor) must notify the instructor at least two weeks prior to the date of the planned absence. At that time the instructor will set a date and time when make-up assignments will be completed.

Social Security and FERPA Statement

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number. The electronic transmission of grades (e.g., via e-mail) risks violation of the Family Educational Rights and Privacy Act; grades will not be transmitted electronically.

Emergency Exits and Evacuation

Everyone is required to exit the building when a fire alarm goes off. Follow your instructor's directions regarding the appropriate exit. If you require assistance during an evacuation, inform your instructor in the first week of class. Do not re-enter the building unless given permission by University Police, Fire department, or Fire Prevention Services.

Student Standards of Academic Conduct

Disciplinary proceedings may be initiated against any student who engages in scholastic dishonesty, including, but not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.

I. "Cheating" includes, but is not limited to:

- copying from another student's test paper;
- using, during a test, materials not authorized by the person giving the test;
- failure to comply with instructions given by the person administering the test;
- possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes". The presence of textbooks constitutes a violation if they have been specifically prohibited by the person administering the test;
- using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
- collaborating with or seeking aid from another student during a test or other assignment without authority;
- discussing the contents of an examination with another student who will take the examination; • divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructors has designated that the examination is not to be removed from the examination room or not to be returned or to be kept by the student;
- substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
- paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program or information about an unadministered test, test key, home solution or computer program;
- falsifying research data, laboratory reports, and/or other academic work offered for credit;
- taking, keeping, misplacing, or damaging the property of The University of Texas at Tyler, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
- misrepresenting facts, including providing false grades or resumes, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.

II. "Plagiarism" includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another's work and the submission of it as one's own academic work offered for credit.

III. "Collusion" includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

IV. All written work that is submitted will be subject to review by plagiarism software.

UT Tyler Resources for Students

- UT Tyler Writing Center (903.565.5995), writingcenter@uttyler.edu
- UT Tyler Tutoring Center (903.565.5964), tutoring@uttyler.edu
- The Mathematics Learning Center, RBN 4021, this is the open access computer lab for math students, with tutors on duty to assist students who are enrolled in early-career courses.
- UT Tyler Counseling Center (903.566.7254)

CHEMISTRY 5316*

Spring 2021

Topic

Measurements and noise

Electrochemical principles

Voltammetry

Chromatographic principles

GC & LC

Capillary Electrophoresis

SFC

Properties of light, optics

Atomic absorption spectrophotometry

Atomic emission spectrophotometry

Molecular absorption spectrophotometry

Molecular fluorescence

IR

Raman

Mass Spectrometry

Surface Techniques

* **Subject to changes**