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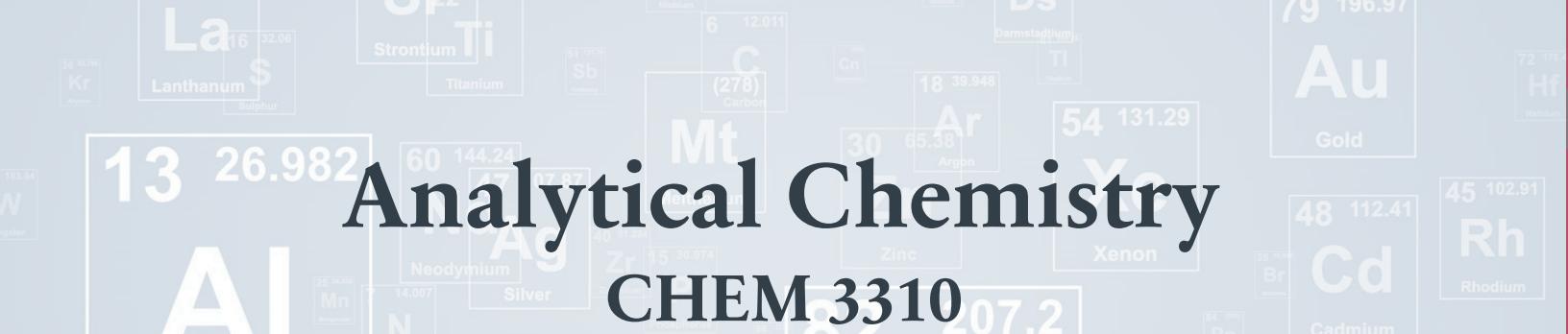
DEPARTMENT OF
CHEMISTRY & BIOCHEMISTRY

Analytical Chemistry

CHEM 3310 Syllabus

Spring 2026

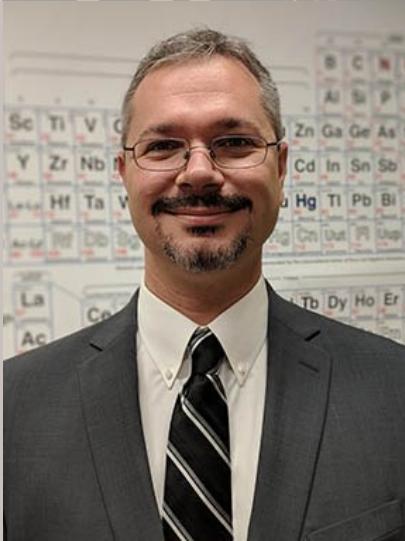
The University of Texas at Tyler
3900 University Blvd.
Tyler, TX 75799



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Analytical Chemistry

CHEM 3310



Instructor

Jason DiStefano

Lecturer of Chemistry
Department of Chemistry
& Biochemistry

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Office Hours

By appointment
Wed. 2:00 – 4:00 P.M.
Fri. 1:00 – 4:00 P.M.

Recommended Content

Quantitative Chemical Analysis,
8th ed., 9th ed., or 10th edition
by Daniel C. Harris

www.uttyler.edu/chemistry/



Welcome to Analytical Chemistry

Course Description

This course introduces the fundamental principles and practices of chemical analysis with an emphasis on quantitative measurement, data quality, and chemical problem solving. Topics include statistical treatment of data, sampling and sample preparation, chemical equilibria as applied to analytical systems, acid-base, complexation, precipitation, and redox titrations, electrochemical methods, spectroscopy, and chromatographic techniques. Students will use chemical theory and quantitative reasoning to critically analyze and solve theoretical problems in analytical chemistry.

Prerequisite: General Chemistry II (CHEM 1312) and General Chemistry II Laboratory (CHEM 1112).

Course Overview

This course provides an in-depth study of the theoretical foundations of analytical chemistry with an emphasis on quantitative reasoning and critical thinking. Students will examine how chemical principles, mathematical relationships, and equilibrium concepts are used to design, evaluate, and interpret analytical methods.

Throughout the course, students will engage in solving multi-step, theory-based problems that require integration of chemical concepts, mathematical analysis, and logical reasoning. Emphasis is placed on evaluating assumptions, assessing data quality, and selecting appropriate analytical approaches for a given chemical problem. This course is designed to strengthen the students' ability to think analytically and apply theory to unfamiliar scenarios, preparing them for advanced laboratory work, research, and professional applications in chemistry and related fields.

Student Learning Outcomes

By the end of this course, you should be able to:

- Describe how certain chemical systems are modeled (CTS, EQS).
- Explain the principles upon which many chemical analyses are based (CTS, EQS).
- Perform several techniques commonly used in chemical analysis (CTS, EQS, TW).
- Assess data obtained using common analytical methods (CTS, EQS, TW).
- Solve real life problems by designing and performing the chemical analysis (CTS, EQS, COM, TW).

Critical Thinking Skills (CTS), Communications Skills (COM), Empirical and Quantitative Skills (EQS), Teamwork (TW)

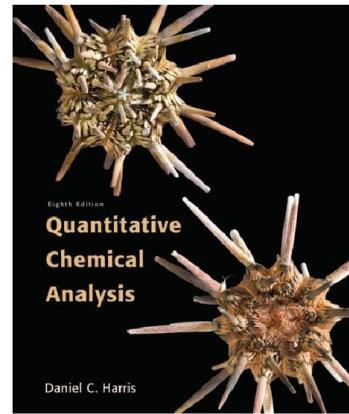
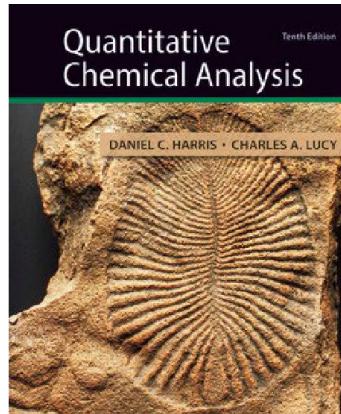
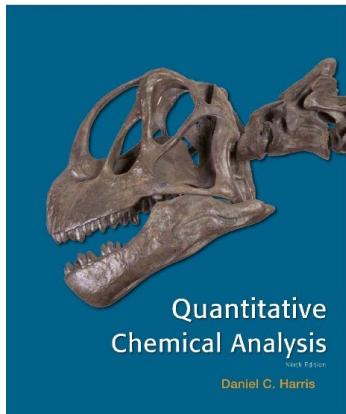
Your performance will be assessed through homework assignments and exams (see below).

Important Information

- January 19 – Martin Luther King Jr. Holiday (no class)
- January 26 – Census Day, deadline for all registrations and schedule changes
- March 9–13 – Spring Break for faculty and students (no class)
- March 30 (Monday)– Last day to withdraw from the course with a “W”; see your instructor if you decide to drop a class.
- April 29 (Wednesday) from 10:15am–12:15pm – Final Exam

Materials Required for the Course:

- **Computer Access:** Excel, high-speed internet with up-to-date Chrome or Firefox browser, Windows, Mac, or Chrome Operating System
- **Textbook:** *Quantitative Chemical Analysis*, 8th ed., 9th ed., or 10th edition by Daniel C. Harris (hardcover text) (ISBN: 1429218150), loose-leaf version, or e-book. E-book is also available at UT Tyler Library: <https://ebookcentral.proquest.com/lib/uttyler/detail.action?docID=6643919>



- Six months access code for ACHIEVE Online Homework <https://achieve.macmillanlearning.com/courses/t88guy>
- A curious mind and a good attitude

Achieve Online Homework is
REQUIRED for homework assignments



Scientific calculator capable of exponents and logarithms is required for the homework, mid-term exams, and final exam.

Achieve Access Code Options

- Bookstore, ISBN: 9781319393861
- Purchase online (easier/cheaper) when you register for Achieve through this class's Canvas course.

Online Homework (20% of total grade)

- There is a 2-week grace period before you must purchase it. **I will not allow you to work all the homework for the semester in 2 weeks!**
- Homework is 20% of your grade. It can make or break your grade.
- Don't wait till the last minute. Everyone logging in at the same time causes problems.
- A 5% penalty, per day, is applied to assignments not finished by the due date.

- Homework will be assigned for each chapter and may be ***due 5 days after assignment***. Depending on the class schedule for the semester, this means that assignments may be due either on the weekend (Saturday or Sunday).
- All assignment notices will be posted on Canvas. Please try to complete homework assignments on time. Microsoft Edge may not work with Achieve, so you may want to use another browser instead (Chrome, Firefox, etc.). Mobile devices also don't play well with Achieve; so using a desktop computer, laptop, or tablet is recommended.
- Please stay proactive with the homework assignments. I have a family that I attend to in the evening and may not be available for questions or responding to emails before the homework deadlines.
- Do not buy "USED" Achieve access codes, they probably won't work!

To enroll in the Achieve section for this course follow the steps below

- Click the Macmillan Learning link (between the Modules and Assignments links) on the Canvas navigation bar
- Then click the Achieve link (goes to Achieve home page) and you will be prompted to enter your name and email address.
- Follow these instructions for help connecting your *Canvas* and *Achieve* accounts. You will have the option to pay for access, enter a code from a purchase, or start the free 2-week trial. Note: I will not post all the assignments in the first two weeks.

Other helpful links

- Disable your browser's pop-up blockers and refer to the troubleshooting guide if you experience any difficulty accessing Achieve.
- Browse Achieve > Getting Started Guide for Students.
- Chat with Macmillan Customer Support.



Course Grading

Your overall course grade will tentatively be based on the 90/80/70/60 percentage scale, but it may be adjusted based upon your instructor's judgment of the overall class performance. The weighted averages for each assignment is shown below. Help sessions will be conducted during the semester and I will be available during my office hours. Please come ask me for help if you aren't clear about something. Don't wait until the last minute before an exam to seek assistance.

Online Homework (Achieve):

Homework problem sets will be assigned for each chapter. Due dates will be announced in class and posted on Canvas. The online homework problems are accessed through Canvas/Achieve. It will be very difficult to succeed in the course without doing the homework. Homework counts as 20% of your total course grade.

Homework questions can be attempted multiple times before the due date passes, but each new attempt incurs a 5% score penalty.

Students are strongly encouraged not to wait until the last minute to do homework. The problems within are complex and take time to solve. This is not a course for which cramming is a good idea. "Poor planning equals poor performance." Homework assignments alone are not sufficient enough to study for an exam. You should be developing additional study skills to succeed on exams.

Final Exam:

The final examination will be given at the date and time according to the final exam schedule posted by the University.

You are required to take the final examination in order to receive a passing grade in the course. There will be no make-up of the final exam!

The comprehensive final examination is written by the American Chemical Society for first-term general chemistry (60-70 multiple-choice questions).

Assignment Past Due Date Policy:

All due dates and/or times are "set in stone" and nonnegotiable (unless unforeseen circumstances require changes). Assignments can be turned in after the due date but will incur a 20% per business day grade reduction. The first reduction occurs immediately after the due date and time. Subsequent reductions occur every 24 hours after the due date and time. Weekend days (Saturday and Sunday) do not count in the grade reduction.

Dropping the Course:

The last day to withdraw from the course with an automatic grade of "W" is listed on the schedule. Before dropping the course, you should consult with your instructor to examine all of your options. Dropping this course does not obligate you to also drop the laboratory course because they are two separate courses. However, dropping the lecture course may significantly hinder your progress in the laboratory course because you will be expected to learn the chemical theories and concepts on your own.

The grades for this course will be weighted as follows:

20%	Online Homework
60%	Mid-Term Exams
20%	ACS Comprehensive Final
100%	Total

Mid-Term Exams:

The mid-term exam dates listed on page 6 are tentative. The exams will consist of ~20-30 multiple-choice questions and ~3 partial credit short answer/calculation questions.

Exams will start promptly at the beginning of class and you will end after exactly 50 minutes. Students that arrive late to the exam will not be given any additional time.

Scantrons and scratch paper will be provided. You may bring a pencil and a scientific non-programmable, non-graphing calculator. No other materials are permitted during the test.

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.

I will do my best for accurate and quick grading. However, I do make mistakes from time to time. If you have a question about a scantron marking, see me before leaving class the day they are returned. If you feel that I make a grading error, please see me within one week after receiving the graded exam. All scores are considered final one week after grades are posted on Canvas!

Attendance Policy

Attendance is essential. This is a 15-week course that covers a lot of material. Lectures are in-person and will not be posted online. The Department of Chemistry & Biochemistry requires a certain amount of material to be covered in Analytical Chemistry. *An unexcused absence results in a grade of zero for any exam missed.*

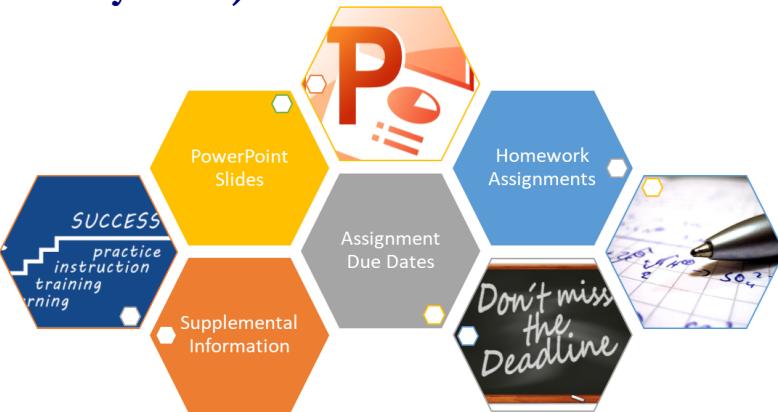
Normally, an excused absence includes medical emergencies, a death in your family or required travel for a UT Tyler's event (e.g., athletic team travel). All supporting documentation should be presented to the instructor.

Students who anticipate being absent from class due to a religious observance are *required* to inform their instructors of such absences as soon as possible (at least one week before the religious holiday). Students who anticipate being absent from class due to a required travel for a UT Tyler's event (e.g., athletic team travel) are *required* to inform their instructor(s) of such absences at least one week before the absence.

Canvas (Learning Management System)

Canvas is an integral part of this course. I will communicate with you mostly through Canvas. All course content will also be uploaded to Canvas. Canvas can be accessed via: <https://www.uttyler.edu/canvas/>

Your Canvas access will begin once you accept the emailed invitation for this course.



Achieve Sign-Up Links

1. My course is called Analytical Chemistry (Spring '26)-DiStefano
2. The course ID is 80oho

Once you have registered and enrolled, you can log in at any time to complete or review your homework assignments.

Statement of Class Performance

Analytical Chemistry is a upper-division chemistry course designed to prepare you for advance chemical analysis in research and graduate school. An "A" in this course reflects true professional-level excellence. It is earned through consistent, high-quality work that demonstrates mastery, not simply by completing assignments or participating.

Grades are based on demonstrated mastery of course outcomes, including problem-solving, data analysis, and critical interpretation. Completing homework assignments and exams does not guarantee an A; this level is reserved for work that excels across all aspects of the course, including conceptual understanding, analytical reasoning, and problem set critical thinking. A "B" indicates mastery of select competencies, while an "A" reflects exceptional performance across all categories.

Attendance, timely submissions, and engagement are essential. Falling short in these areas, or producing work that does not demonstrate clarity, precision, and critical thinking, will affect your grade. Your grade reflects what you achieved, not what you intended, and this reflection is crucial for your growth as an analytical chemist.

Course Schedule

<u>Day:</u>	<u>Class Schedule</u>	<u>Chapter</u>
Week 1	Class Introduction, The Analytical Process, Chemical Measurements Experimental Error	0-1 3
Week 2	Experimental Error Statistics	3 4
Week 3	Chemical Equilibrium Activity and the Systematic Treatment of Equilibria	6 8
Week 4	Activity and the Systematic Treatment of Equilibria Mid-Term Exam 1	8
Week 5	Monoprotic Acid-Base Equilibria	9
Week 6	Polyprotic Acid-Base Equilibria	10
Week 7	Acid-Base Titrations	11
Week 8	Fundamentals of Spectroscopy Mid-Term Exam 2	18
Week 9	Spring Break	
Week 10	Fundamentals of Spectroscopy Applications of Spectrophotometry	18 19
Week 11	Fundamentals of Electrochemistry	14
Week 12	Fundamentals of Electrochemistry Electrodes and Potentiometry	14 15
Week 13	Electrodes and Potentiometry	15
Week 14	Introductions to Analytical Separations Mid-Term Exam 3	23
Week 15	Introductions to Analytical Separations	23
Week 16	Final Exam	

Note: the right to substitute or switch dates, as required by unforeseen circumstances, is reserved.

University Policies & Important Information

Withdrawing from Class

Students may withdraw (drop) from this course using the Withdrawal Portal. Withdrawing (dropping) this course can impact your Financial Aid, Scholarships, Veteran Benefits, Exemptions, Waivers, International Student Status, housing, and degree progress. Please speak with your instructors, consider your options, speak with your advisor, and visit the One-Stop Service Center (STE 230) or email enroll@uttyler.edu to get a complete review of your student account and the possible impacts to withdrawing. We want you to make an informed decision. UT Tyler faculty and staff are here for you and often can provide additional support options or assistance. Make sure to carefully read the implications for withdrawing from a course and the instructions on using the Withdrawal portal..

Texas law prohibits students from dropping more than six courses during their entire undergraduate career*. The six courses dropped includes those from other 2-year or 4-year Texas public colleges and universities. Consider the impact withdrawing from this class has on your academic progress and other areas, such as financial implications. We encourage you to consult your advisor(s) and Enrollment Services for additional guidance. **CAUTION #1:** Withdrawing before census day does not mean you get a full refund. Please see the Tuition and Fee Refund Schedule. **CAUTION #2:** All international students must check with the Office of International Programs before withdrawing. All international students are required to enroll full-time for fall and spring terms. **CAUTION #3:** All UT Tyler Athletes must check with the Athletic Academic Coordinator before withdrawing from a course. **CAUTION #4:** All veterans or military-affiliated students should consult with the Military and Veterans Success Center.

* Students who began college for the first time before 2007 are exempt from this law.

Final Exam Policy

Final examinations are administered as scheduled. If unusual circumstances require that special arrangements be made for an individual student or class, the Dean of the appropriate college, after consultation with the faculty member involved, may authorize an exception to the schedule. Faculty members must maintain student final examination papers for a minimum of three months following the examination date.

Incomplete Grade Policy

If a student, because of extenuating circumstances, is unable to complete all of the requirements for a course by the end of the semester, then the instructor may recommend an Incomplete (I) for the course. The "I" may be assigned in place of a grade *only when all of the following conditions are met:* (a) the student has been making satisfactory progress in the course; (b) the student is unable to complete all coursework or final exam due to unusual circumstances that are beyond personal control and are acceptable to the instructor, and (c) the student presents these reasons before the time that the final grade roster is due. The semester credit hours for an Incomplete will not be used to calculate the grade point average.

The student and the instructor must submit an Incomplete Form detailing the work required and the time by which the work must be completed to their respective department chair or college dean for approval. The time limit established must not exceed one year. Should the student fail to meet all of the work for the course within the time limit, then the instructor may assign zeros to the unfinished work, compute the course average for the student, and assign the appropriate grade. If a grade has yet to be assigned within one year, then the Incomplete will be changed to an F, or NC. If the course was initially taken under the CR/NC grading basis, this may adversely affect the student's academic standing.

Grade Appeal Policy

Disputes regarding grades must be initiated within sixty (60) days from the date of receiving the final course grade by filing a Grade Appeal Form with the instructor who assigned the grade. A grade appeal should be used when the student thinks the final course grade awarded does not reflect the grades earned on assessments or follow the grading scale as documented in the syllabus. The student should provide the rationale for the grade appeal and attach supporting document about the grades earned. The form should be sent via email to the faculty member who assigned the grade. The faculty member reviews the rationale and supporting documentation and completes the instruction section of the form. The instructor should return the form to the student, even if a grade change is made at this level. If the student is not satisfied with the decision, the student may appeal in writing to the Chairperson of the department from which the grade was issued. In situations where there is an allegation of capricious grading, discrimination, or unlawful actions, appeals may go beyond the Chairperson to the Dean or the Dean's designee of the college from which the grade was issued, with that decision being final. The Grade Appeal form is found in the Registrar's Form Library.

NOTE: The Grade Appeal Form is different from the Application for Appeal form submitted to the Student Appeals Committee, which does not rule on grade disputes as described in this policy.

Students on an F-1 Visa

To remain in compliance with Federal Regulations requirements you must do the following:

- Traditional face-to-face classes: Attend classes on the regular meeting days/times.
- Hybrid Classes: Attend all face-to-face classes convened by the instructor according to the schedule set for your specific course.
- Online course: Only one online course can count toward your full-time enrollment. Students are expected to be fully engaged and meet all requirements for the online course.

Campus Carry

We respect the right and privacy of students 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>.

University Policies & Important Information

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 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 the Assistant Director Student Accessibility and Resources/ADA Coordinator. For more information, including filling out an application for services, please visit the SAR webpage at <https://www.uttyler.edu/disability-services>, the SAR office located in the Robert Muntz Library, LIB 460, email saroffice@uttyler.edu, or call 903.566.7079."

Military Affiliated Students

UT Tyler honors the service and sacrifices of our military-affiliated students. If you are a student who is a veteran, on active duty, in the reserves or National Guard, or a military spouse or dependent, please stay in contact with your faculty member if any aspect of your present or prior service or family situation makes it difficult for you to fulfill the requirements of a course or creates disruption in your academic progress. It is important to make your faculty member aware of any complications as far in advance as possible. Your faculty member is willing to work with you and, if needed, put you in contact with university staff who are trained to assist you. The [Military and Veterans Success Center \(MVSC\)](#) has campus resources for military-affiliated students. The MVSC can be reached at MVSC@uttyler.edu or via phone at 903.565.5972.

Academic Honesty and Academic Misconduct

The UT Tyler community comes together to pledge that "Honor and integrity will not allow me to lie, cheat, or steal, nor to accept the actions of those who do." Therefore, we enforce the [Student Conduct and Discipline policy](#) in the Student Manual Of Operating Procedures (Section 8).

FERPA

UT Tyler follows the Family Educational Rights and Privacy Act (FERPA) as noted in [University Policy 5.2.3](#). The course instructor will follow all requirements to protect your confidential information.

Absence for Official University Events or Activities

This course follows the practices related to [Excused Absences for University Events or Activities](#) as noted in the Catalog.

Absence for Religious Holidays

This course follows the practices related to [Excused Absences for Religious Holy Days as noted in the Catalog](#).

Absence for Pregnant Students

This course follows the requirements of Texas Laws SB 412, SB 459, SB 597/HB 1361 to meet the needs of pregnant and parenting students. Part of the supports afforded pregnant students includes excused absences. Faculty who are informed by a student of needing this support should make a referral to the Parenting Student Liaison. NOTE: Students must work with the Parenting Student Liaison in order to receive these supports. Students should reach out to the Parenting Student Liaison at parents@uttyler.edu and also complete the [Pregnant and Parenting Self-Reporting Form](#).

Recording of Class Sessions

Class sessions may be recorded by the instructor for use by students enrolled in the course. Recordings that contain personally identifiable information or other information subject to FERPA shall not be shared with individuals not enrolled in the 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.

Artificial Intelligence Statement

UT Tyler is committed to exploring and using artificial intelligence (AI) tools as appropriate for the discipline and task undertaken. We encourage discussing AI tools' ethical, societal, philosophical, and disciplinary implications. All uses of AI should be acknowledged as this aligns with our commitment to honor and integrity, as noted in UT Tyler's Honor Code. Faculty and students must not use protected information, data, or copyrighted materials when using any AI tool. Additionally, users should be aware that AI tools rely on predictive models to generate content that may appear correct but is sometimes shown to be incomplete, inaccurate, taken without attribution from other sources, and/or biased. Consequently, an AI tool should not be considered a substitute for traditional approaches to research. You are ultimately responsible for the quality and content of the information you submit. Misusing AI tools that violate the guidelines specified for this course is considered a breach of academic integrity. The student will be subject to disciplinary actions as outlined in UT Tyler's Academic Integrity Policy. *Refer to the About This Course section of the UT Tyler Syllabus Module for specific information on appropriate use of AI in your course(s).*

For this course, AI is not permitted in this course at all. I expect all work students submit for this course to be their own. To best support your learning, you must complete all graded assignments by yourself to assist in your learning. This exclusion of other resources to help complete assignments includes artificial intelligence (AI). Refrain from using AI tools to generate any course context (e.g., text, video, audio, images, code, etc.) for an assignment or classroom assignment.

Student Resources

Resources to assist you in the course

- [UT Tyler Student Accessibility and Resource \(SAR\) Office](#) (provides needed accommodations to students with document needs related to access and learning)
- [UT Tyler Writing Center](#)
- [The Mathematics Learning Center](#)
- [UT Tyler PASS Tutoring Center](#)
- [UT Tyler Supplemental Instruction](#)
- [Upswing \(24/7 online tutoring\) - covers nearly all undergraduate course areas](#)
- [Robert Muntz Library](#) and [Library Liaison](#)
- [Canvas 101](#) (learn to use Canvas, proctoring, Unicheck, and other software)
- Digital Support Toolkit (for supported courses only. Students are automatically enrolled in the toolkit for supported courses)
- LIB 422 -- Computer Lab where students can take a proctored exam
- [The Career Success Center](#)
- [UT Tyler Testing Center](#)
- [Office of Research & Scholarship Design and Data Analysis Lab](#)

Resources available to UT Tyler Students

- [UT Tyler Counseling Center](#) (available to all students)
- [MySSP App](#) (24/7 access to Student Support Program counseling through phone or chat and online wellness resources available in a variety of languages)
- [Student Assistance and Advocacy Center](#)
- [Military and Veterans Success Center](#) (supports for our military-affiliated students)
- [UT Tyler Patriot Food Pantry](#)
- [UT Tyler Financial Aid and Scholarships](#)
- [UT Tyler Student Business Services](#) (pay or set up payment plans, etc.)
- [UT Tyler Registrar's Office](#)
- [Office of International Programs](#)
- [Title IX Reporting](#)
- [Patriots Engage](#) (available to all students. Get engaged at UT Tyler.)