

## CHEM 4351: FORENSIC CHEMISTRY LABORATORY (SPRING 2022)

### Instructor Contact

**Name:** Dr. Charlie Williams

**Pronouns:** she/her/hers

**Office Location:** Chem 263

**Phone Number:** n/a

**Office Hours:** Wednesday 9-11 or by appointment

**Email:** [Charlie.williams@unt.edu](mailto:Charlie.williams@unt.edu)

### Teaching Assistant Contact

**Rachel Koerber**

**Karen Reyes**

**Office Location:** Hickory 001

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### Communication Expectations:

I can be reached most easily via email or the internal Canvas messaging system. If you are attaching pictures to a Canvas message, however, please clearly indicate you are doing so in your message. I will typically respond within 24 hours unless you email me between 5 pm Friday and 5 pm Sunday. I will typically be available in person for Wednesday office hours. Other times for an in-person or virtual meeting can be arranged by appointment. Outside of these times, if my office door is open, always feel free to stop in!

### Welcome to UNT!

As members of the UNT community, we have all made a commitment to be part of an institution that respects and values the identities of the students and employees with whom we interact. UNT does not tolerate identity-based discrimination, harassment, and retaliation. UNT's full Non-Discrimination Policy can be found in the UNT Policies section of the syllabus.

### Course Description

This course surveys various topics in forensic chemistry (see list of topics below). An emphasis is placed hands on lab exercises and maintaining a detailed, professional looking lab notebook.

### Course Structure

This course meets once per week for lecture and twice per week for lab. There will also be supplementary instructional material delivered via Canvas.

### Lecture

**Schedule:** M 11:00-12:00 (Monday, January 24 – Monday, May 2)

**Location:** CHEM 352

**Topics:**

- Stats/Solution-Making/QC
- Separations
- Drugs
- Toxicology
- Ink and Paint
- Chemical Warfare Agents
- Arson and Explosives
- Spectroscopy
- Chromatography
- Mass Spectrometry
- Topics as needed

Lab

**Schedule:** TR 11:00 – 2:00 (beginning January 25)

**Location:** CHEM 280 and 283

**Topics:**

- Solution prep/QC
  - UV-Vis
- Fiber/Fabric
  - Solubility
  - FTIR
  - TLC - dye
- Drugs
  - Color tests
  - FTIR
  - GC-MS
- Mid-Term Practical
- Toxicology
  - GC-FID (BAC)
  - ICP-MS (arsenic)
  - LC-MS (urine)
- GSR
  - Color tests
  - ICP-MS
- Accelerants
  - Headspace GC
- Final Practical

This is subject to change as needed.

## Course Prerequisites or Other Restrictions

Prerequisites: CHEM 2380, 3451, 3452 (C or better)

## Course Objectives

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

1. Construct a Shewhart chart and assess QC data points for potential issues
2. Discuss the types of compounds that would need to be analyzed in different forensic scenarios
3. Discuss basic drug and alcohol metabolism
4. Explain the different lab methodologies commonly used in forensic chemistry
5. Create and use reagents for color tests of drugs and GSR
6. Perform separations to analyze samples or prepare samples for analysis
7. Perform instrumental analysis of drugs, ethanol, inks, trace metals, accelerant residue, and other types of chemical evidence
8. Produce a thorough, professional report

## Materials

1 bound lab notebook (not spiral-bound, may use notebook) and blue or black ink pen

Calculator

Lab safety glasses or goggles

Proper lab attire - Full shoes, long pants, and preferably something to secure long hair, if applicable

## Teaching Philosophy

I am a facilitator of learning, but I cannot learn for you. I place great value on students seeking out their own answers. As such, I have a pretty relaxed LAB cell phone policy as long as the freedom is not abused. I encourage students to look up information when they have a question (if possible) and seek me or a TA out for clarification or reinforcement. I am of course always willing to help fill in the gaps or point you in the right direction as needed, but I believe learning is much more effective and long-term when the learner makes efforts to find the answers first.

I do not believe in busy work or assigning homework simply to have something to grade. I also do not believe in writing exams that contain 'trick questions', are unnecessarily difficult, or worth an undue portion of your grade. If I assign you a homework or assessment, it's because I think it will help you learn material and help you progress on your journey to becoming a professional scientist.

## Course Technology & Skills

### Minimum Technology Requirements

- Computer
- Reliable internet access
- Speakers
- Microphone
- Zoom

- Webcam
- Microsoft Office Suite
- [Canvas Technical Requirements](https://clear.unt.edu/supported-technologies/canvas/requirements) (https://clear.unt.edu/supported-technologies/canvas/requirements)

### Computer Skills & Digital Literacy

Provide a list of course-specific technical skills learners must have to succeed in the course, such as:

- Using Canvas
- Using email with attachments
- Using Microsoft Office (primarily Word and Excel)

### Course Requirements

This is a combined lecture/lab course, so success in this course requires success in both environments. There is no reason you should not obtain a desirable grade in this class if you follow all of these guidelines.

1. Attend lectures
2. Attend labs (mandatory)
3. Bring your lab notebook and pen to every lab
4. Maintain a thorough, legible lab notebook
5. Turn in assignments in a timely fashion
6. Study for 3 hours a week (not just for exams)
7. Follow provided guidelines for completing lab reports
8. Show up for exams
9. Show your work and use proper significant figures
10. Visit office hours if you need help

### Grading

Your grade for the course can be determined by the formula **(total points earned)/(total points possible)\*100**. For example, if all assignment grades add up to 1000 possible points, 900 points and above would earn you an A for the semester.

A = 90.0% and above

B = 80.0% - 89.9%

C = 70.0% - 79.9%

D = 60.0% - 69.9%

F = 59.9% and below

I am not known for last minute grade-rounding. If you feel that there have been any errors in assignment grading, you are responsible for contacting myself or the TA within 1 week of receiving that grade.

I may alter point values for assignments at any time, but in general, you can expect the following point values.

Short essay or problem-based assignments: 30-50 points each

Lab reports: 50 points each

Exams: 100 points each (total of 2)

Final Exam: 200 points

## Course Evaluation

Student Perceptions of Teaching (SPOT) is the student evaluation system for UNT and allows students the ability to confidentially provide constructive feedback to their instructor and department to improve the quality of student experiences in the course. **These evaluations will be announced in class and 5 bonus points will be given if we receive a response rate of 80% or higher.**

## Course Policies

### Attendance Policy

Attendance to lecture is expected and students are responsible for all material presented in lecture whether present or not. It is your responsibility to catch up with a classmate or come to my office hours for clarifications.

**Attendance to lab is mandatory.** Failure to attend a lab will result in a zero for that lab report unless you have a university-approved excuse and I've received communication from the Dean of Students Office. If you are more than 15 minutes late, you may not be allowed to participate in lab that day. Under no circumstances should you write a report for a lab you did not perform without my express permission and instruction.

### COVID-19 Impact on Attendance

If you are experiencing any symptoms of COVID-19 (<https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html>) please seek medical attention from the Student Health and Wellness Center (940-565-2333 or [askSHWC@unt.edu](mailto:askSHWC@unt.edu)) or your health care provider PRIOR to coming to campus. UNT also requires you to contact the UNT COVID Hotline at 844-366-5892 or [COVID@unt.edu](mailto:COVID@unt.edu) for guidance on actions to take due to symptoms, pending or positive test results, or potential exposure. While attendance is an important part of succeeding in this class, your own health, and those of others in the community, is more important.

### Statement on Face Covering

Face coverings indoors are currently recommended by the CDC, so I ask that everyone wear masks to class and lab.

### Late Work

Late work will be accepted until the last day of classes with an increasing point penalty (10% the first day, 20% the second day, to a maximum of 50%). This penalty will be waived with a university-approved excuse.

## Examination Policy

There will be two midterm exams and a final exam. The midterms will test over any lecture or lab material that has been discussed for that segment of the course (i.e., Exam 2 is NOT cumulative). The final exam IS cumulative.

### **Tentative midterm exam dates:**

**Exam 1:** Monday, February 21

**Exam 2:** Monday, April 4

**Final exam date:** Monday, May 9

No one may begin an assessment after the first student has completed and turned in their assessment.

No one will be given extra assessment time due to lateness.

You'll need a calculator and pencil or pen.

No phones will be allowed during exams and must be stored in your bags – failure to comply with this will result in an immediate dismissal from the examination, a zero, and possible reporting of Academic Dishonesty.

I will not offer make-up exams or alternate exam dates without a university-approved excuse and communication from the Dean of Students or Office of Disability Accommodation.

## Assignment Policy

There will be several assignments of various format throughout the semester. For essay assignments, I do not ask for a minimum or maximum number of pages, simply that you write enough to convey all of the relevant details of the assignment. ALWAYS cite your sources.

Any calculations performed for assignments or assessments should be fully shown with units and appropriate significant figures. I encourage you to use Excel whenever possible – guidance for how to show work in this fashion will be provided at a later time.

Assignment due dates will generally be announced in class 1 week before they are due. Assignment instructions and due dates will be included in the assignment on Canvas.

All assignments should be submitted in Canvas as .DOC, .DOCX, or .PDF (preferred).

Turnitin will be used for short essay submission. If your similarity score is above 50%, you may receive a zero for that assignment so be sure to write everything in your own words. Always cite your sources!

## Instructor Responsibilities and Feedback

- It is my responsibility to help students grow and learn, provide clear instructions for projects and assessments, answer questions about assignments, identify additional resources as necessary, review and update course content, etc.
- I will typically reply to emails within 24 hours except on weekends as discussed in the Contact section
- Grades will typically be posted within 1 week unless an announcement is made otherwise

## Syllabus Change Policy

This syllabus may be changed at any time. Changes will be announced via Canvas in as timely a fashion as possible.

Due dates will be announced in class and will be visible on the assignments themselves on Canvas and are also subject to change.

## UNT Policies

### Academic Integrity Policy

Academic Integrity Standards and Consequences. According to UNT Policy 06.003, Student Academic Integrity, academic dishonesty occurs when students engage in behaviors including, but not limited to cheating, fabrication, facilitating academic dishonesty, forgery, plagiarism, and sabotage. A finding of academic dishonesty may result in a range of academic penalties or sanctions ranging from admonition to expulsion from the University.

Ethical behavior is important in all scientific disciplines, but it is especially paramount in forensic science. Therefore, I adopt a zero-tolerance policy with respect to any violations of academic integrity. Any students found to be copying work, distributing assessment materials, dry-labbing (making up results), writing reports using a classmate's lab results without permission, or using a cell phone during an exam will immediately result in a failing grade.

### ADA Policy

UNT makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Office of Disability Accommodation (ODA) to verify their eligibility. If a disability is verified, the ODA will provide a student with an accommodation letter to be delivered to faculty to begin a private discussion regarding one's specific course needs. Students may request accommodations at any time, however, ODA notices of accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of accommodation for every semester and must meet with each faculty member prior to implementation in each class. For additional information see the [ODA website \(https://disability.unt.edu/\)](https://disability.unt.edu/).

## Academic Support & Student Services

### Student Support Services

#### *Mental Health*

UNT provides mental health resources to students to help ensure there are numerous outlets to turn to that wholeheartedly care for and are there for students in need, regardless of the nature of an issue or its severity. Listed below are several resources on campus that can support your academic success and mental well-being:

- [Student Health and Wellness Center](https://studentaffairs.unt.edu/student-health-and-wellness-center) (https://studentaffairs.unt.edu/student-health-and-wellness-center)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (https://studentaffairs.unt.edu/counseling-and-testing-services)
- [UNT Care Team](https://studentaffairs.unt.edu/care) (https://studentaffairs.unt.edu/care)

- [UNT Psychiatric Services](https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry) (https://studentaffairs.unt.edu/student-health-and-wellness-center/services/psychiatry)
- [Individual Counseling](https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling) (https://studentaffairs.unt.edu/counseling-and-testing-services/services/individual-counseling)

### *Chosen Names*

A chosen name is a name that a person goes by that may or may not match their legal name. If you have a chosen name that is different from your legal name and would like that to be used in class, please let the instructor know. Below is a list of resources for updating your chosen name at UNT.

- [UNT Records](#)
- [UNT ID Card](#)
- [UNT Email Address](#)
- [Legal Name](#)

*\*UNT eUIDs cannot be changed at this time. The collaborating offices are working on a process to make this option accessible to UNT community members.*

### *Pronouns*

Pronouns (she/her, they/them, he/him, etc.) are a public way for people to address you, much like your name, and can be shared with a name when making an introduction, both virtually and in-person. Just as we ask and don't assume someone's name, we should also ask and not assume someone's pronouns.

You can [add your pronouns to your Canvas account](#) so that they follow your name when posting to discussion boards, submitting assignments, etc.

Below is a list of additional resources regarding pronouns and their usage:

- [What are pronouns and why are they important?](#)
- [How do I use pronouns?](#)
- [How do I share my pronouns?](#)
- [How do I ask for another person's pronouns?](#)
- [How do I correct myself or others when the wrong pronoun is used?](#)

### *Additional Student Support Services*

- [Registrar](https://registrar.unt.edu/registration) (https://registrar.unt.edu/registration)
- [Financial Aid](https://financialaid.unt.edu/) (https://financialaid.unt.edu/)
- [Student Legal Services](https://studentaffairs.unt.edu/student-legal-services) (https://studentaffairs.unt.edu/student-legal-services)
- [Career Center](https://studentaffairs.unt.edu/career-center) (https://studentaffairs.unt.edu/career-center)
- [Multicultural Center](https://edo.unt.edu/multicultural-center) (https://edo.unt.edu/multicultural-center)
- [Counseling and Testing Services](https://studentaffairs.unt.edu/counseling-and-testing-services) (https://studentaffairs.unt.edu/counseling-and-testing-services)
- [Pride Alliance](https://edo.unt.edu/pridealliance) (https://edo.unt.edu/pridealliance)
- [UNT Food Pantry](https://deanofstudents.unt.edu/resources/food-pantry) (https://deanofstudents.unt.edu/resources/food-pantry)

### *Academic Support Services*

- [Academic Resource Center](https://clear.unt.edu/canvas/student-resources) (https://clear.unt.edu/canvas/student-resources)
- [Academic Success Center](https://success.unt.edu/asc) (https://success.unt.edu/asc)
- [UNT Libraries](https://library.unt.edu/) (https://library.unt.edu/)



- [Writing Lab](http://writingcenter.unt.edu/) (http://writingcenter.unt.edu/)

### Rules of Engagement

Rules of engagement refer to the way students are expected to interact with each other and with their instructors. Here are some general guidelines:

- While the freedom to express yourself is a fundamental human right, any communication that utilizes cruel and derogatory language on the basis of race, color, national origin, religion, sex, sexual orientation, gender identity, gender expression, age, disability, genetic information, veteran status, or any other characteristic protected under applicable federal or state law will not be tolerated.
- Treat your instructor and classmates with respect in any communication online or face-to-face, even when their opinion differs from your own.
- Ask for and use the correct name and pronouns for your instructor and classmates.
- Speak from personal experiences. Use “I” statements to share thoughts and feelings. Try not to speak on behalf of groups or other individual’s experiences.
- Use your critical thinking skills to challenge other people’s ideas, instead of attacking individuals.
- Avoid using all caps while communicating digitally. This may be interpreted as “YELLING!”
- Be cautious when using humor or sarcasm in emails or discussion posts as tone can be difficult to interpret digitally.
- Avoid using “text-talk” unless explicitly permitted by your instructor.
- Proofread and fact-check your sources.
- Keep in mind that online posts can be permanent, so think first before you type.

See these [Engagement Guidelines](https://clear.unt.edu/online-communication-tips) (https://clear.unt.edu/online-communication-tips) for more information.