CHEM 4351: FORENSIC CHEMISTRY LABORATORY (SPRING 2021)

Instructor Contact

Name: Dr. Charlie Williams Pronouns: she/her/hers Office Location: Chem 263 Phone Number: n/a

Office Hours: Wednesday 9-11, virtual by appointment on Tuesday and Thursday afternoons

Zoom link: https://unt.zoom.us/j/87658852709

Email: Charlie.williams@unt.edu

Teaching Assistant Contact

Camila Anguiano Virgen

Email: CamilaAnguianoVirgen@my.unt.edu

Ashleé Smith (Juel)

Email: laurenjuel@my.unt.edu

Office Location: Hickory 001 Phone: 940-369-7934

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 or via Zoom for Wednesday office hours, and Tuesday/Thursday appointments will be arranged virtually unless a specific scenario dictates otherwise.

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 is delivered in a mixed modality with Zoom lectures once per week and in-person lab once per week.

Lecture: Virtual via Zoom: https://unt.zoom.us/j/89752269031

Schedule: M 10:00-11:30 (Monday, January 11 – Monday, April 19)

TOPICS:

Statistics and Quality Control

Drugs

Toxicology

Ink and Paint

Chemical Warfare Agents

Arson and Explosives

Spectroscopy

Chromatography

Mass Spectrometry

Topics as needed

Lab: Lab meets each week in CHEM 280 and 283 (Monday, January 25 – Tuesday, April 20)

Section 001: Monday 6:00 – 8:50 pm

Section 002: Tuesday 8:00 - 11:00 am

LAB EXERCISES:

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Week 1-4 (Jan. 25<sup>th</sup> – Feb 16<sup>th</sup>)
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Lab 1: Accurate Solution Prep (Quant Lab)

Lab 2: TLC – Analysis of Lipstick (Quant Lab)

Lab 3: Organic Chemical Spot Tests (Quant Lab)

Lab 4: Soil Examination (Quant Lab)

Week 5-8 (Feb. 22nd – Mar. 16th)

Lab 5: UV-Vis – Analysis of Food Dyes (Chem Closet)

Lab 6: ATR-IR – Analysis of Synthetic Fiber (Instrumental Lab)

<u>Lab 7:</u> ATR-IR – Analysis of Drugs and Pharmaceuticals (Instrumental Lab)

Lab 8: GC-MS – Analysis of Arson Accelerants (Instrumental Lab)

Week 9-13 (Mar. 22nd – April 20th)

<u>Lab 9:</u> Mini GC – Analysis of Plasma for Ethanol and other VOCs (Quant Lab)

<u>Lab 10:</u> GC-FID – Blood Alcohol Analysis by Headspace GC-FID (Golden Lab)

<u>Lab 11:</u> HPLC-MS – Analysis of Drug Mixture (Verbeck Lab)

Lab 12: ICP-MS – Analysis of Trace Metals (Verbeck Lab)

Course Prerequisites or Other Restrictions

Prerequisite(s): CHEM 2380, 3451, 3452.

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
- 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. Perform color tests for drugs and explosives with supervision
- 6. Perform instrumental analysis of drugs, ethanol, inks, trace metals, accelerant residue, and fabrics with supervision
- 7. Maintain a professional looking analytical notebook

Materials

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

Lab safety glasses or goggles

Teaching Philosophy

In order to benefit most from this course, students should attend each lecture. If lectures are conducted virtually, students should keep their web cam turned on for maximum engagement if at all possible. This will help with material retention and accountability, plus – it helps me not speak to an empty screen! I have found that everyone's experience is improved in this way.

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 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 believe learning is much more effective and long-term when it takes place in this manner.

I do not believe in busy work or assigning homework simply to have something to grade. If I ask you to complete a task, it's because I think it will help you learn material and help you progress on your journey to becoming a professional in the forensic field.

Course Technology & Skills

Minimum Technology Requirements

- Computer
- Reliable internet access
- Speakers
- Microphone
- Zoom
- Webcam
- Microsoft Office Suite
- <u>Canvas Technical Requirements</u> (https://clear.unt.edu/supportedtechnologies/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)

Technical Assistance

Part of working in the online environment involves dealing with the inconveniences and frustration that can arise when technology breaks down or does not perform as expected. Here at UNT we have a Student Help Desk that you can contact for help with Canvas or other technology issues.

UIT Help Desk: UIT Student Help Desk site (http://www.unt.edu/helpdesk/index.htm)

Email: helpdesk@unt.edu Phone: 940-565-2324

In Person: Sage Hall, Room 130 Walk-In Availability: 8am-9pm

Telephone Availability:

• Sunday: noon-midnight

Monday-Thursday: 8am-midnight

• Friday: 8am-8pm Saturday: 9am-5pm Laptop Checkout: 8am-7pm

For additional support, visit Canvas Technical Help (https://community.canvaslms.com/docs/DOC-10554-4212710328)

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) for more information.

Course Requirements

This is a combined lecture/lab course, but the requirements for each environment are separated below for simplicity.

Lecture

Attendance to lecture is expected and students are responsible for all material presented in lecture whether present or not.

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.

There will be two exams worth ~100 points each and a final exam worth ~200 points.

Lab

Each lab entry will be kept in a notebook with blue or black ink. Your TA will cover specific requirements during your first lab for how labs are graded and a summary will be provided on Canvas. Lab attendance is mandatory and no make-up labs will be possible without a university-approved excuse. If you are more than 15 minutes late, you may not be allowed to participate in lab that day.

Proper attire must be worn during lab – no exposed skin below the waist, full shoes, long hair preferably tied back. Some labs can be guite messy, so keep that in mind as you dress for lab as well.

The lab notebook will be turned in before Reading Day for grading.

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 notebook entries: 50 points each (total of 13)

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 is expected and is an integral part of success in this course.

COVID-19 Impact on Attendance

While attendance is expected as outlined above, it is important for all of us to be mindful of the health and safety of everyone in our community, especially given concerns about COVID-19. Please contact me if you are unable to attend class because you are ill, or unable to attend class due to a related issue regarding COVID-19. It is important that you communicate with me prior to being absent so I may make a decision about accommodating your request to be excused from class.

If you are experiencing any <u>symptoms of COVID-19</u> (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) 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 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 are required in all UNT facilities. Students are expected to wear face coverings during this class. If you are unable to wear a face covering due to a disability, please contact the Office of Disability Access to request an accommodation. UNT face covering requirements are subject to change due to community health guidelines. Any changes will be communicated via the instructor.

Class Participation

Class participation is often a key piece of this course and is always encouraged. Participation in lab exercises is mandatory and critical for effective learning.

Late Work

Late work will be accepted up to 5 days late with an increasing point penalty (10% the first day, 20% the second day, etc.).

Examination Policy

There will be two semester exams and a final exam.

Exam 1 material: stats - toxicology

Exam 2 material: ink/paint – arson/explosives

Final exam material: cumulative (approximately 50% new material)

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.

Assignment Policy

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!

The University is committed to providing a reliable online course system to all users. However, in the event of any unexpected server outage or any unusual technical difficulty which prevents students from completing a time sensitive assessment activity, the instructor will extend the time windows and provide an appropriate accommodation based on the situation. Students should immediately report any problems to the instructor and contact the UNT Student Help Desk: helpdesk@unt.edu or 940.565.2324 and obtain a ticket number. The instructor and the UNT Student Help Desk will work with the student to resolve any issues at the earliest possible time.

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
- 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.

As students in the forensic science program, ethical behavior is paramount. Therefore, I adopt a zero tolerance policy with respect to any violations of academic integrity. Any students found to be cheating may immediately receive 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/).

Prohibition of Discrimination, Harassment, and Retaliation (Policy 16.004)

The University of North Texas (UNT) prohibits discrimination and harassment because 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 in its application and admission processes; educational programs and activities; employment policies, procedures, and processes; and university facilities. The University takes active measures to prevent such conduct and investigates and takes remedial action when appropriate.

Emergency Notification & Procedures

UNT uses a system called Eagle Alert to quickly notify students with critical information in the event of an emergency (i.e., severe weather, campus closing, and health and public safety emergencies like chemical spills, fires, or violence). In the event of a university closure, please refer to Canvas for contingency plans for covering course materials.

Retention of Student Records

Student records pertaining to this course are maintained in a secure location by the instructor of record. All records such as exams, answer sheets (with keys), and written papers submitted during the duration of the course are kept for at least one calendar year after course completion. Course work completed via the Canvas online system, including grading information and comments, is also stored in a safe electronic environment for one year. Students have the right to view their individual record; however, information about student's records will not be divulged to other individuals without proper written consent. Students are encouraged to review the Public Information Policy and the Family Educational Rights and Privacy Act (FERPA) laws and the University's policy. See UNT Policy 10.10, Records Management and Retention for additional information.

Acceptable Student Behavior

Student behavior that interferes with an instructor's ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The University's expectations for student conduct apply to all instructional forums, including University and electronic classroom, labs, discussion groups, field trips, etc. Visit UNT's Code of Student Conduct (https://deanofstudents.unt.edu/conduct) to learn more.

Access to Information - Eagle Connect

Students' access point for business and academic services at UNT is located at: my.unt.edu. All official communication from the University will be delivered to a student's Eagle Connect account. For more information, please visit the website that explains Eagle Connect and how to forward e-mail Eagle <u>Connect</u> (https://it.unt.edu/eagleconnect).

Student Evaluation Administration Dates

Student feedback is important and an essential part of participation in this course. The student evaluation of instruction is a requirement for all organized classes at UNT. The survey will be made available during weeks 13, 14 and 15 of the long semesters to provide students with an opportunity to evaluate how this course is taught. Students will receive an email from "UNT SPOT Course Evaluations via IASystem Notification" (no-reply@iasystem.org) with the survey link. Students should look for the email in their UNT email inbox. Simply click on the link and complete the survey. Once students complete the survey they will receive a confirmation email that the survey has been submitted. For additional information, please visit the <u>SPOT website</u> (http://spot.unt.edu/) or email <u>spot@unt.edu</u>.

Sexual Assault Prevention

UNT is committed to providing a safe learning environment free of all forms of sexual misconduct, including sexual harassment sexual assault, domestic violence, dating violence, and stalking. Federal laws (Title IX and the Violence Against Women Act) and UNT policies prohibit discrimination on the basis of sex, and therefore prohibit sexual misconduct. If you or someone you know is experiencing sexual harassment, relationship violence, stalking, and/or sexual assault, there are campus resources available to provide support and assistance. UNT's Survivor Advocates can assist a student who has been impacted by violence by filing protective orders, completing crime victim's compensation applications, contacting professors for absences related to an assault, working with housing to facilitate a room change where appropriate, and connecting students to other resources available both on and off campus. The Survivor Advocates can be reached at SurvivorAdvocate@unt.edu or by calling the Dean of Students Office at 940-565- 2648. Additionally, alleged sexual misconduct can be non-confidentially reported to the Title IX Coordinator at oeo@unt.edu or at (940) 565 2759.

Important Notice for F-1 Students taking Distance Education Courses

Federal Regulation

To read detailed Immigration and Customs Enforcement regulations for F-1 students taking online courses, please go to the <u>Electronic Code of Federal Regulations website</u> (http://www.ecfr.gov/). The specific portion concerning distance education courses is located at Title 8 CFR 214.2 Paragraph (f)(6)(i)(G).

The paragraph reads:

(G) For F-1 students enrolled in classes for credit or classroom hours, no more than the equivalent of one class or three credits per session, term, semester, trimester, or quarter may be counted toward the full course of study requirement if the class is taken on-line or through distance education and does not require the student's physical attendance for classes, examination or other purposes integral to completion of the class. An on-line or distance education course is a course that is offered principally through the use of television, audio, or computer transmission including open broadcast, closed circuit, cable, microwave, or satellite, audio conferencing, or computer conferencing. If the F-1 student's course of study is in a language study program, no on-line or distance education classes may be considered to count toward a student's full course of study requirement.

University of North Texas Compliance

To comply with immigration regulations, an F-1 visa holder within the United States may need to engage in an on-campus experiential component for this course. This component (which must be approved in advance by the instructor) can include activities such as taking an on-campus exam, participating in an on-campus lecture or lab activity, or other on-campus experience integral to the completion of this course.

If such an on-campus activity is required, it is the student's responsibility to do the following:

- (1) Submit a written request to the instructor for an on-campus experiential component within one week of the start of the course.
- (2) Ensure that the activity on campus takes place and the instructor documents it in writing with a notice sent to the International Student and Scholar Services Office. ISSS has a form available that you may use for this purpose.

Because the decision may have serious immigration consequences, if an F-1 student is unsure about his or her need to participate in an on-campus experiential component for this course, s/he should contact

the UNT International Student and Scholar Services Office (telephone 940-565-2195 or email <u>internationaladvising@unt.edu</u>) to get clarification before the one-week deadline.

Student Verification

UNT takes measures to protect the integrity of educational credentials awarded to students enrolled in distance education courses by verifying student identity, protecting student privacy, and notifying students of any special meeting times/locations or additional charges associated with student identity verification in distance education courses.

See UNT Policy 07-002 Student Identity Verification, Privacy, and Notification and Distance Education Courses (https://policy.unt.edu/policy/07-002).

Use of Student Work

A student owns the copyright for all work (e.g. software, photographs, reports, presentations, and email postings) he or she creates within a class and the University is not entitled to use any student work without the student's permission unless all of the following criteria are met:

- The work is used only once.
- The work is not used in its entirety.
- Use of the work does not affect any potential profits from the work.
- The student is not identified.
- The work is identified as student work.

If the use of the work does not meet all of the above criteria, then the University office or department using the work must obtain the student's written permission.

Transmission and Recording of Student Images in Electronically-Delivered Courses

- 1. No permission is needed from a student for his or her image or voice to be transmitted live via videoconference or streaming media, but all students should be informed when courses are to be conducted using either method of delivery.
- 2. In the event an instructor records student presentations, he or she must obtain permission from the student using a signed release in order to use the recording for future classes in accordance with the Use of Student-Created Work guidelines above.
- 3. Instructors who video-record their class lectures with the intention of re-using some or all of recordings for future class offerings must notify students on the course syllabus if students' images may appear on video. Instructors are also advised to provide accommodation for students who do not wish to appear in class recordings.

No notification is needed if only audio and slide capture is used or if the video only records the instructor's image. However, the instructor is encouraged to let students know the recordings will be available to them for study purposes.

Class Recordings & Student Likenesses

Synchronous (live) sessions in this course will be recorded for students enrolled in this class section to refer to throughout the semester. Class recordings are the intellectual property of the university or instructor and are reserved for use only by students in this class and only for educational purposes. Students may not post or otherwise share the recordings outside the class, or outside the Canvas Learning Management System, in any form. Failing to follow this restriction is a violation of the UNT Code of Student Conduct and could lead to disciplinary action.

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-andwellness-center)
- <u>Counseling and Testing Services</u> (https://studentaffairs.unt.edu/counseling-and-testing-services)
- <u>UNT Care Team</u> (https://studentaffairs.unt.edu/care)
- <u>UNT Psychiatric Services</u> (https://studentaffairs.unt.edu/student-health-and-wellnesscenter/services/psychiatry)
- <u>Individual Counseling</u> (https://studentaffairs.unt.edu/counseling-and-testingservices/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:

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

Additional Student Support Services

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

Academic Support Services

- Academic Resource Center (https://clear.unt.edu/canvas/student-resources)
- Academic Success Center (https://success.unt.edu/asc)
- <u>UNT Libraries</u> (https://library.unt.edu/)
- Writing Lab (http://writingcenter.unt.edu/)