

The
University of
Texas at Tyler

CHEM 1320 Forensic Chemistry I

Fall 2024

Tuesdays
1:30-4:30 pm

Instructor Information:

	Office	Office Hours	Email	Phone
Dr. Laura Miller	RBS 3032	M, F 9-10 am; T 10 -11 am; W 9-11 am	lmiller@uttyler.edu	566-7137

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Course Description

The study of chemistry can make a worthwhile contribution to the education of any student. Chemistry is a legitimate part of a cultural education, since it leads to better understanding of a diverse range of issues, ranging from environmental to health care to forensics to geopolitics of resource use.

One must know something of science to read modern newspapers and magazines with full understanding. The extent to which chemistry influences our lives has become so great that technical topics

are items of daily conversation. Chemistry is constantly providing us with a supply of new things for better living, for longer and healthier lives, and for increased leisure in which to enjoy life. Chemistry is playing an important role in the exploration of the universe. It thus becomes evident that knowledge of chemistry is an important possession of any intelligent, well-informed member of our society.

The approach of the forensic chemistry course makes it suitable for non-science, non-engineering, and non-nursing majors. The development of the

subject presupposes a basic background in algebra at the high school level but does not presuppose previous training in chemistry.

Chemistry is an experimental science. Chemical knowledge has resulted from experimental observations and studies made by thousands of scientists. In the chemistry laboratory, students will examine, test, and establish for themselves the forensic chemical principles studied in class and from textbooks; will collect experimental data; and will use their reasoning to draw logical conclusions about the meaning of these data.

Course

Class will meet in RBS 4014 on Tuesdays from 1:30 -4:30 pm to starting August 27 — December 10, except Thanksgiving Break (November 25-29).

This is a hybrid course. The lab portion will be face-to-face while the lecture portion will be presented using online

lecture videos available through our Canvas site. There are 6 modules (one per chapter) containing the lecture videos, PowerPoint notes, quizzes, etc. Students in this course are responsible for all of the content and material included in and re-

quired by this course, both face-to-face and online. Coming only to the face-to-face meetings will not be enough to successfully complete this course. Students should have all necessary materials (notes, calculator, periodic table) at each class

meeting. If you are unable to attend a class meeting, all discussed material and all given assignments are your responsibility.

This course will have a significant online presence on Canvas.

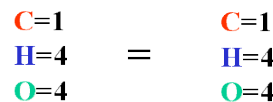
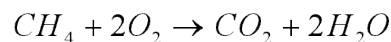
Student Learning Outcomes

Throughout the semester students will be required to demonstrate a working knowledge of the fundamentals of chemistry with an emphasis on forensics using Critical Thinking Skills (CT), Communication Skills (COM), Empirical and Quantitative Skills (EQS), and Teamwork (TW).



By the end of the course successful students should be able to:

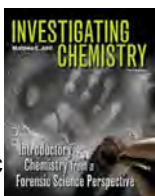
- 1) Demonstrate critical thinking and deductive reasoning skills by collecting and analyzing mock crime-scene evidence and using the scientific method to formulate reasonable conclusions. (CT)



- 2) Manipulate and analyze data collected in the lab or given in lecture. (EQS)
- 3) Demonstrate teamwork and communication by investigating a crime scene as part of a team and submit a written report once the crime has been solved. (TW and COM)

Instructional Materials

- Recommended: Investigating Chemistry by Matthew E Johl. 4th edition via E-Book Read and Practice registration link: <https://achieve.macmillanlearning.com/courses/6ktm8u>



- Each group must purchase and maintain a bound laboratory notebook in which to generate a *permanent* record of experimental observations, notes, calculations, etc. The lab notebook must provide:

1. a label for your name and phone number/email address, or other contact information, name of the department, course, semester and section numbers, and instructor's name;
2. a table of contents page for entering experiment titles *chronologically*;
3. pages consecutively *pre-numbered*;
4. *preprinted* page headings for entering title, name, and *specific* lab section (e.g., CHEM 1320-001);
5. a *perforated*, carbonless duplicate for each page.

- Splash-proof* safety goggles must

be worn in the laboratory whenever you or your neighbors are performing experiments. (Time during your initial lab period will be allotted for purchasing goggles from your American Chemical Society Student Chapter on campus to ensure that you will be prepared to comply with this requirement.)

- Students must wear long pants/skirts (no leggings) and close toed shoes.

Warning: students will not be allowed to work in the lab without an appropriate coverage from chest to toes! (**This means no open-toed shoes or extensive areas of exposed skin on your torso!**)

Failure to have the proper attire (goggles, shoes, etc.) will result in your being asked to leave the laboratory until you have the proper attire.

Required:

Lab Manual: LabPartner Chemistry Introduction to Forensic Chemistry Manual (ISBN: 9781319528102) Available for purchase at the UT Tyler Bookstore.

Tentative Topics/Tentative Test Dates

Chapter 1	Introduction to Forensic Chemistry
Chapter 2	Evidence Collection and Preservation
Chapter 3	Atomic Clues
Chapter 4	Chemical Evidence
Chapter 6	Properties of Solutions I: Aqueous Solutions
Chapter 5	Chemistry of Bonding: Structure and Function of Drug Molecules



These dates and chapters covered are tentative and are subject to change.

Midterm	Tuesday, October 15 th
Final	Tuesday, December 3 rd

Dropping the Course

The last day to withdraw from the course without penalty is September 9, 2024. The last day to withdraw from the course with an automatic grade of "W" is November 4, 2024. To withdraw from the course, students should initiate withdrawals with the instructor.

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 approach-

es 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.

For this course, students can use AI platforms to help prepare for assignments and projects. They are not to be used during exams. These programs can be powerful tools for learning, including completing assignments in less time or serving as a personalized learning tool by creating extra practice worksheets. You can use AI tools to revise and edit your answers to



the post lab questions and writing the group project (e.g., identify flaws in reasoning, spot confusing or underdeveloped paragraphs, or correct citations).

However, your ethical responsibilities as a student remain the same. You must follow UT Tyler's Honor Code and uphold the highest standards of academic honesty. This applies to all uncited or improperly cited content, whether created by a human or in collaboration with an AI tool. If you use an AI tool to develop content for an assignment (such as an answer to a post lab question), you must cite the tool's contribution to your work. Sections of the final group project that is word-for-word generated by AI should appear in a different colored font. Remember that AI is not always 100% accurate and sometimes struggles with complex problem-solving tasks, such as interpreting data and mathematical problems.

How to Succeed in CHEM 1320



Students must study outside of class to be successful in this course. Outside ^{Page} work includes watching the lecture videos, working the video problems, carefully examining the in-chapter exercises, reviewing lecture notes, completing the pre-lab and reading the lab experimental procedure prior to lab, etc. Typically this requires 2 or more hours for each hour of lecture. Please take advantage of the posted office hours to seek assistance during the semester. When you can write out the material from memory and solve problems without looking anything up, which takes lots of repetition and practice, you are ready for the tests. Review your all graded materials for accuracy in grading.

Completing the Read and Practice activities from the E-book should help improve understanding of some concepts. <https://achieve.macmillanlearning.com/courses/9toh3r>

Attendance Policy

Attendance is required. Since we only meet once every two weeks it is very crucial that you be at every meeting. Unexcused absences will result in grades of zero for any work missed during those absences. Only students with OFFICIAL excused absences will be allowed to make-up work missed during the absences. It is the students' responsibility to see the instructor to make up any work missed during absences. Students will not be allowed to attend another lab section unless they have an official excused absence.

Attendance will be taken daily and will be considered when assigning borderline grades. If you are unable to attend a lab class meeting, all discussed material and all given assignments are your respon-

sibility. Punctuality is mandatory. Please do not interrupt class time by entering late or leaving early.

Students should bring their textbook, lab manual, notebook, pencil, calculator, and all other necessary materials to each class meeting.

Arrive *on time* and *be prepared* for each lab class meeting. **Please note: you will complete a short (< 10 min.) pre-lab quiz before each lab period.** Failure to be prepared could result in serious mistakes in carrying out the lab procedures or not being able to finish the experiment in the time allotted. (**Warning:** insufficient time in the lab period is NOT a valid reason for submitting a late or incomplete report.)

Each group is required to keep a laboratory notebook of the course. This



notebook is to be a complete record of all experiments performed in the lab during this semester.

Do not use the report sheets to document data in the lab. These materials are helpful in preparing for exams and will also serve to document your grades, should the need arise to contest your average.

Bring all your materials required for lab—especially, goggles, your lab manual and your lab notebook.

Maintain a clean and orderly working area. **CLEAN UP AFTER YOURSELF!** Students will be responsible for maintaining cleanliness in the desk areas. Students who neglect their clean-up responsibility will have their grades significantly lowered for that day's work.

To know and understand the policies that affect your rights and responsibilities as a student at UT Tyler, please follow this link: [University Policies and 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 include 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.

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).

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 is-

sued, 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.

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.

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.

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](#).

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>.

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, quitlines, and group support. For more information on cessation programs please visit www.uttyler.edu/tobacco-free.

Grades will tentatively be based on a 90/80/70/60 scale, but may be adjusted based upon my evaluation of the overall class performance. Attendance, class participation, and initiative will be considered for borderline grades.

Lab Reports: Lab reports must be turned in at the end of the lab period. The Lab Report grade also reflects the instructor's subjective impression of your lab work habits, including but not limited to, punctuality, personal organization, spirit of community

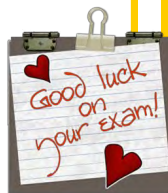
Reports turned in late are subject to the loss of 5% for each 24 hour period late. Reports more than 2 weeks late will not be accepted. Reports not turned in will result in a grade of 0, so turning in a late report is better than not turning it in at all. Due dates for lab reports remain **unchanged**, even if the student must conduct the experiment on a different day than his/her assigned day.

Each experiment will have a pre-lab assignment to be turned in with the report. This assignment will help students better prepare for the quiz and experiment. For the pre-lab assignment, students will need to write a short purpose of the experiment and summarize (in your own words) the procedure. If you do not have the pre-lab assignment completed, then you will be asked to sit outside the lab room until completed. The ultimate goal of keeping a running diary of your lab work in a lab notebook is to provide enough detail for someone (including yourself) to reproduce *exactly* what you did in lab, including changes from the published procedures, so as to share or confirm your findings. To meet this goal it is important to:

1. Make all entries in ink and identify mistaken entries by drawing a *single* line through them.
2. Keep a running Table of Contents.
3. Record data *directly* into your record book *as soon as it is done or observed!* **Never write anything pertinent to your experimentation on Summary Report sheets or anywhere else!**
4. Always record data with their appropriate units of measurement.

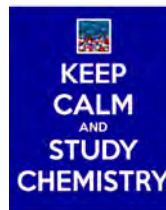
You will turn in one report per group. Each member will take turns being responsible for the pre-lab, data, and discussion questions. It is expected that you work together to complete the report.

Group Project: At the beginning of the course you will come across a mock crime scene. You will work in groups of 3-4 students to solve the crime by completing various experiments. At the end of the course you will be required to write a paper as if you were actual detectives asking a judge (the instructor) for an arrest warrant based on the evidence collected and tested.



Quizzes: This is a hybrid course and as such will require you to watch the lecture material online. There will be quizzes built into the online lecture videos. These will be short (2 to 5 questions). At the end of each chapter there will be a quiz on Canvas covering the all chapter material to help you prepared for the exams. There will also be a lab quiz before each experiment.

The percentage grades for this course will be weighted as follows:



30%	Exams (2)
15%	Video Quizzes
15%	Chapter Quizzes
10%	Lab Quizzes
10%	Lap Reports
20%	<u>Group Project</u>
100%	Total

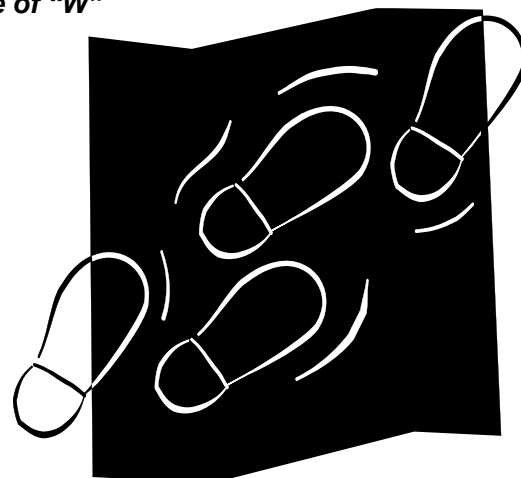
Examinations: Tests will cover material from the text, labs, class discussions, quizzes, and other assigned material. Even material in assigned chapters of the text but not discussed during class periods may appear on a test/final. Any exceptions will be announced in class. **To reiterate:** The tests are based on the lectures and lab—so don't miss a single one! **A student who does not show his/her student identification to the instructor when requested during an exam period will not receive a grade for the test/final exam.** Students are allowed only to keep pencils, eraser, calculator and identification at their desks during a test. A 3½ x 5 inch note card (handwritten, no photocopies or printed materials) is permitted for each exam. **During an exam, all other items (phones and any "smart" watch) must be inside a closed bag.** 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.

You must take the final examination to receive a passing grade in the course. Final exams cannot be taken early and there will be no make-up of the final exam!

****Note: If required by unforeseen circumstances, the right to change the schedule is retained.**

X. TENTATIVE SCHEDULE WITH TEST DATES These dates and material covered are tentative and are subject to change.

Date	Lecture/Laboratory Activities
Aug 27	Introduction to Lecture and the Chemistry Laboratory: Syllabus, Schedule, Laboratory Notebooks, Laboratory Reports, Safety Video 1: Chapter 1 Sec 1.1-1.2; Video 2: Chapter 1 Sec 1.3; Chapter 2 Sec 2.1; Video 3: Chapter 2 Sec 2.2-2.3; Video 4: Chapter 2 Sec 2.4-2.6;
Sep 3	*Crime Scene & Measurements (Experiment #1)
Sep 10	Video 5: Chapter 1 Sec 1.4-1.7; Video 6: Chapter 2 Sec 2.7-2.10
Sep 17	*Thin Layer Chromatography (Experiment #2)
Sep 24	Video 7: Chapter 3 Sec 3.1-3.3; Video 8: Chapter 3 Sec 3.4-3.7; Video 9: Chapter 3 Sec 3.8-3.9; Video 10: Chapter 3 Sec 3.10-3.12
Oct 1	*Soil Examination (Experiment #3)
Oct 8	Exam 1 Help Session Video 11: Chapter 4 Sec 4.1-4.2; Video 12: Chapter 4 Sec 4.3; Video 13: Chapter 4 Sec 4.4-4.6; Video 14: Chapter 4 Sec 4.7-4.11
Oct 15	Exam 1 (Chapters 1 – 3, Experiments 1, 2 & 3)
Oct 22	*Footwear Impressions and Physical Matches (Experiment #4)
Oct 29	Video 15: Chapter 6 Sec 6.1-6.2; Video 16: Chapter 6 Sec 6.3-6.4; Video 17: Chapter 6 Sec 6.5-6.7; Video 18: Chapter 6 Sec 6.8-6.12
Nov 4	Last day to drop or withdraw from a course with an automatic grade of "W"
Nov 5	*Fingerprints (Experiment #5)
Nov 12	Video 19: Chapter 5 Sec 5.1; Video 20: Chapter 5 Sec 5.2-5.4 Video 21: Chapter 5 Sec 5.5-5.6 Video 22: Chapter 5 Sec 5.5-5.9
Nov 19	Exam 2 Help Session, Project work day, Make-up lab (if necessary)
Nov 26	No classes meet (Thanksgiving Break)
Dec 3	Exam 2 (Chapters 4-6, Experiments 4, 5 & 6) Group project report due



*These labs will be used together to write final group lab report solving the crime found at beginning of the semester.