FRSC 367 Forensic Chemistry
Classroom: SC 5331
Meeting Times: Monday 6:00 – 8:50 PM
Instructor: Lindsay Armstrong, M.S.
Office Hours: By Appointment
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Required Materials:

- Textbook: Elkins, K. (2019). *Introduction to Forensic Chemistry by Kelly Elkins.* Taylor & Francis Group.

Calculator: Any scientific calculator is suitable for the course. The calculator should be able to display scientific notation, be able to take roots of numbers, raise numbers to any power, take logarithms and antilogarithms in base 10 and base e, and perform trigonometric functions including sin/cos/tan.

Catalog description:
Introduction to chemical and physical analyses used by a modern crime laboratory in the evaluation of physical evidence encountered in criminal acts. Areas of concentration will include forensic microscopy, drug analysis, toxicology, explosives analysis, arson examination, and trace evidence. Emphasis will be placed on the value of such examinations as presented by the expert witness in a criminal trial. Prerequisites: CHEM 220/ CHEM 220L (CHEM 210) and CHEM 332.

Learning outcomes:
In this class, you will learn why and how a forensic crime laboratory operates. The analytical methods and theories supporting crime investigation will be discussed, analyzed, and applied through lab technique demonstrations followed by your hands-on practice of some techniques. Upon successful completion of this course, you will have a better understanding of how Forensic Chemistry fits in the overall scheme of criminal investigations.

The class will consist of lecture via PowerPoint, videos, slides, and other visual aids and laboratory demonstrations of the material as time permits. Students are expected to read assigned textbook chapters prior to class. Some hands-on lab activities will be incorporated.

Cell Phones:
Cell phone usage in the classroom is strictly prohibited. If you need to take a call in case of emergency (e.g., sick child, parent care, etc.), exit the classroom to the adjacent hallway. Excessive cell phone use will not be tolerated.

Students with Disabilities:
This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Disability Support Services (DSS), 7720 York Road, Suite 232, 410-704-2638 (Voice) or 410-704-4423 (TDD). Students who expect that they have a disability but do not have documentation are encouraged to contact DSS for advice on how to obtain appropriate evaluation. A memo from DSS authorizing your accommodation is needed before any accommodation can be made.

Diversity Statement:
Towson University values diversity and fosters a climate that is grounded in respect and inclusion, enriches the educational experience of students, supports positive workplace environments, promotes excellence, and cultivates the intellectual and personal growth of the entire university community.

Statement of Requirements:
Grading:
Grades will be based on three or four quizzes or classwork projects, two exams (a midterm and a final exam) and a presentation. The exams and the PowerPoint presentation (with least three peer-reviewed journal or reference textbook references) will be worth 100 points each.

Grading Scale:

93-100	A	77-79.9	C+
90-92.9	A-	70-76.9	C
87-89.9	B+	67-69.9	D+
83-86.9	B	60-66.9	D
80-82.9	B^-	Below 60	F

Attendance is MANDATORY.

- An excused absence may be granted in the case of a **medical emergency or some such extreme event**; however, minor medical conditions such as a doctor's appointment will not qualify for an excused absence. Please download, print, and fill out the Absence Form on the website and submit it to me within one week of the absence, with photocopies of associated documentation (e.g., a physician's note) when appropriate. You must contact (by e-mail) your instructor in advance, if possible, or at least within 24 hours of the missed class. **Note that presentations are still due by the date stated in the syllabus and will be accepted by email in case of absence.**
- If you are granted an excused absence, you will be required to make up any missed assignments, the due date of which will be determined appropriately to the circumstances. **There will be no make-up midterm or final exams, unless in special emergency as defined by the university.** There will be no extra credit opportunity and no late assignments will be accepted.
- An unexcused absence may be grounds for grade reduction.
- For Graduate Students: Consider attending the Forensic Chemistry Seminars given throughout the semester by forensic professionals.

Chemistry Department Tutoring Center:
The Chemistry Department operates a Tutoring Center in SM 538. The hours of operation are generally 8 AM – 6 PM Monday-Thursday, but these may vary due to the availability of student tutors and/or the teaching schedule of the Director. See the schedule posted on the door for more specific information. There is no charge for the services of the Center, and no appointments are required. The Center can be reached by telephone at (410) 704-3054, at lladon@towson.edu or at www.towson.edu/~ladon.

Course repeat policy: "Students may not repeat a course more than once without prior permission of the Academic Standards Committee."

Student Academic Integrity Policy (TU 03.01.00):
The Towson University Code of Conduct prohibits "all forms of dishonesty including cheating (and) plagiarism." Plagiarism is copying the words of another or the use of ideas of another without proper citation. The consequences of cheating or plagiarism will be a failing grade of 0 points for the assignment. Plagiarism, fabrication, falsification, cheating, complicity in academic dishonesty, abuse of academic materials, multiple submissions of the same work or part thereof for multiple courses/assignments, will not be tolerated and will result in a failing grade of 0 for that assignment. Refer to the Student Academic Integrity Policy found at: http://inside.towson.edu/generalcampus/tupolicies/documents/03-01.00%20Student%20Academic%20Integrity%20Policy.pdf

Important Dates:
March 28: Change of Schedule period ends. Last day to drop a course with no grade posted to academic record. Last day to add.

April 8: Last day to withdraw from full semester courses with a grade of "W." Last day to change to Pass or Audit grading Option.

IMPORTANT: Students who fail to appear for the first two class sessions, or the first session of evening classes, may forfeit their space in class. Instructors have the right to release these spaces to other students wishing to add the class to their schedules. Students who lose their spaces must officially withdraw from the course through Enrollment Services to avoid earning an FX grade for non-attendance.

In Case of Emergency:
In the event of a University-wide emergency course requirements deadlines and grading schemes are subject to changes that may include alternative delivery methods, alternative methods of interaction with the instructor, class materials, and/or classmates, a revised attendance policy, and a revised semester calendar and/or grading scheme. In the case of a University-wide emergency, please refer to the following about changes in this course:

1. Web Site: www.towson.edu
2. Telephone Number(s)
3. TU Text Alert System: This is a service designed to alert the Towson University community via text messages to cell phones when situations arise on campus that affect the ability of the campus to function normally. Sign up: http://www.towson.edu/adminfinance/facilities/police/campusemergency

Forensic Chemistry
September 1: Labor Day - No Class Fall 2025

Schedule

Dates	Chapter	Topic
25-Aug	1	Introduction to Forensic Chemistry and Physical Evidence: forensic science, criminalistics, forensic chemistry, evidence, admissibility in court, expert testimony, integrity, ethics, forensic community, accreditation, SWGDRUG categories of analytical tests
1-Sept		NO CLASS - LABOR DAY
8-Sept	2,3	Chemical tests: presumptive tests, confirmatory tests, major color tests for drugs, microcrystalline test, chemical mechanisms for color tests. Microscopes: compound light microscope, comparison microscope, scanning electron microscope, properties of light, birefringence, Michel-Levy chart.
15-Sept	4,6	Quiz 1 (Chapters 1, 2 and 3) Light Spectroscopy: absorption spectrum, absorption, emission, UV, fluorescence, infrared and Raman spectroscopy, correlation charts. Chromatography: paper, column and liquid chromatography.
22-Sept	6	Lab 1 Classwork #1 Advanced Chromatography: Gas chromatography.
29-Sept	5	Classwork #2/Lab #2 Advanced Spectroscopy: for mass spectrometry and nuclear resonance spectroscopy: identify key features, understand how they work and interpret spectrum.
6-Oct	9	Toxicology: role in forensics, blood alcohol level, application of GC-MS, drug metabolites, quantitating poisons. Review GC-MS and FTIR
13-Oct		Exam I (Midterm) Chapters 1-6 and 9. Presentation Topics Due
20-Oct	8	Controlled substances: controlled substances act, drug schedules, classes of drugs, clandestine labs, new psychoactive substance, identification, quantitation.
27-Oct	8	Continued Controlled substances: controlled substances act, drug schedules, classes of drugs, clandestine labs, new psychoactive substance, identification, quantitation.
3-Nov	11/12	Classwork #3 Questioned Documents and Impression Evidence: differentiate between physical and chemical characteristics, explain how to differentiate inks, identify and preserve impression evidence. Latent Print Development.
10-Nov	10	Trace: physical and chemical characteristics of trace evidence, phases of hair growth, human and animal hair, natural and synthetic fibers, duct tape.
17-Nov	13/14	Firearms: Class and individual characteristics, test fires, serial number restoration. Fire, arson and explosives: Requirements to initiate and sustain a fire, stages of fire, arson, low and high explosives.
24-Nov		Communication: forensic testimony, presentation and soft skills
1-Dec		Student Presentations
8-Dec		Student Presentations; Review for exam
15-Dec		Final Exam

*Instructor may communicate additional topics or schedule changes.