

FRSC 420.001

Dr. Cynthia Zeller

SC 5301B

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Meeting times: TR 2:00-4:50 SC 3323

Office Hours: TR 10-11 am and by appointment

Catalog Description:

Current methods and concepts in forensic biology with laboratory practice in identification and individualization of biological forensic samples by several different methods, including biochemical testing, antigen-antibody reactions, and DNA typing, representing best practice in forensic science. Prerequisite: BIOL 409 (may be taken concurrently). Lab/Class fee will be assessed.

Learning Objectives: Students will learn to perform basic tasks involved with human body fluid identification, including serological testing of blood, semen, and saliva. Students will learn to interpret data and write reports on their findings. Students will be able to test mock evidence samples for the presence of these body fluids, interpret and write reports. Students will learn to extract DNA from evidence samples, develop human genotypes, perform statistical analysis on the data generated and write reports on their findings. Students will participate in a mock trial in which they will answer questions about serology and DNA casework in a court room setting.

Teaching Methods:

This class will be presented in a lecture/discussion/demonstration/performance mode e.g. the instructor will explain and demonstrate (where applicable) the laboratory techniques for examining physical evidence, prior to the student performing tasks. Power Point presentations, videos and other visual aids will be used during class. Reading assignments and journal articles will be assigned as appropriate

Required Materials:  Calculator (any type)

Protective eyewear (either goggles, safety glasses or face shield)

Lab coat

Butler, John Fundamentals of Forensic DNA Typing, 2009 ISBN 978-0-12-374999-4

Li, Richard. Forensic Biology. 2015 ISBN 978-1-4398-8972-5

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.

Important Dates:

February 6, 2024: Change of Schedule period ends for full term (14 weeks).
Last day to drop a course with no grade posted to academic record.

April 8, 2024: Last day to withdraw from full term courses with a grade of W.
Last day to change to pass/fail option or audit options.

No class:

March 17-24, 2024: Spring Break

Tentative Schedule*:

**Please wear closed-toed shoes and ankle-length pants/skirt, and safety eye wear to lab.

Date	Topic	Reading / Assignment
1/28/25	Syllabus, Introduction to Forensic Biology	Syllabus, Li ch 1, Butler ch 1
1/30/25	Laboratory Safety and introduction to the forensic laboratory	Li, ch1-3
2/4/25	Quality Assurance and Quality control	Li, ch 1-3, Butler ch 7
2/6/25	Introduction to Serology, Location of stains,	Li, ch 4,
2/11/25	Introduction to Serology, Location of stains, use of alternate light source, chain of custody, notetaking in laboratory	Li, ch 4,5 Butler ch 4
2/13/25	Identification of blood, testing procedures for blood	Li, 6
2/18/25	Testing procedures for semen	Li, Ch 8, ch 16 Virkler FSI 2009
2/20/25	Testing procedures for saliva/Serological report writing	Li 9
2/25/25	Mock case work	
2/27/25	Mock case work	*
3/4/25	Emerging Modern Serological testing/Journal club	Online resources
3/6/25	MIDTERM	
3/11/25	Introduction to Forensic DNA testing, DNA replication Assignment of DNA case	Butler Ch 2
3/13/25	Casework overview, DNA extraction,	**Serology report due
3/18/25	Spring Break – no class	
3/20/25	Spring Break – no class	
3/25/25	Differential DNA extraction	Butler, ch 2
3/27/25	DNA quantitation	Butler, ch 3
4/1/25	STRs and DNA amplification, review quantitation data	Butler, ch 5, 6
4/3/25	Amplification of casework samples	**
4/8/25	DNA separation and analysis	Butler ch 6
4/10/25	Samples separated by capillary electrophoresis	**
4/15/25	Review of Genetics and Probability for DNA statistical analysis	Butler ch 8
4/17/25	Analysis of electropherograms	**
4/22/25	DNA statistical analysis	Handouts
4/24/25	Mixture Analysis Statistics and Report Writing	Handouts
4/30/24	Paternity testing,	Butler ch 11, 12
5/1/25	Emerging Technologies	Butler ch 17
5/6/25	Course Review	
5/8/25	Mock trial	**DNA report due
May 20 2025 (T)	Final Exam (3:00-5:00 pm)	Final Exam

***Instructor may add additional topics or make schedule changes.**

Attendance: All classes are considered equally important and full attendance and participation is expected. Students who miss more than one class will receive 0 points for participation.

Testing and Grading: No makeup exams or final exam will be given, unless in special emergency as defined by the university. There will be no extra-credit opportunity.

Assessment

Serology case notes and report=150 points

DNA case notes and report =250 points (complete with statistics)

Participation and engagement=100 points

Mock trial=100 points

Midterm exam=200 points

Final Exam=200 points

Grading Scale:

Grade assignment will be based percent of achieved points above on the standard system: A = 929 points or above, A- = 900 – 929 points, B+ = 870-899 points, B=869-829 points, B-=800-829 points, C+= 770-799 points, C=700-769, D=600-699 and F<600 points

Copyright Notice:

Your instructor retains all copyrights to all original materials distributed in this course (including hard copies and electronic copies of lecture slides, notes, practice problems, worksheets, assignments, lab materials, and exams). Reposting, selling, or distributing these materials at any time is prohibited.

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. 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>

Cell Phones:

Cell phone usage in the class meeting/lab is prohibited. Phones shall be stored unless using them for photo documentation of test results. If you need to take an emergency call (e.g., sick child, parent care, etc.), exit the classroom to the adjacent hallway.

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

Students with Disabilities:

This course is in compliance with Towson University policies for students with disabilities. Students with disabilities are encouraged to register with Accessibility and Disability Services (ADS), 7720 York Road, Suite 232, 410-704-2638 (Voice) or 410-704-4423 (TDD) <https://www.towson.edu/accessibility-disability-services/gettingstarted/>. Students who may have a disability but do not have documentation are encouraged to contact ADS for advice on how to obtain appropriate evaluation. A memo from ADS authorizing your accommodation is needed before any accommodation can be provided.

Chemistry Department Statement on Classroom Diversity and Inclusion

The students, faculty, and staff at Towson University represent a diverse and vibrant community of learners and scholars. As a community, we value the unique contributions of everyone and promote active participation in all aspects of the learning process by each community member. Your instructor supports Towson University's goal of fostering a diverse and inclusive educational setting. Your instructor strives to create an educational environment built upon the principles of mutual respect and support. To this end, all members participating in this course must show respect for all other class members. If you feel these expectations have not been met, please speak with your instructor or the chair of the Diversity Action Committee for the Department of Chemistry, Dr. Beth Kautzman (kkautzman@towson.edu). **For further information regarding the diversity and inclusion policies of Towson University, please see [Towson University's Office of Inclusion and Institutional Equity, the Fisher College of Science and Mathematics Diversity Action Plan](#), and the [Chemistry Department Diversity Action Plan](#)**

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. Plagiarism can result from copying an entire document to inappropriate paraphrasing. To avoid plagiarism, the use of words or ideas of another without proper citation, it is imperative to consciously think about what you have read and what you are trying to write. In scientific literature, we do not normally use direct quotes from the primary resources used to gather our information. It is important to paraphrase the ideas and conclusions obtained from the primary literature and rewrite them in your own words. One method to assure that you will not plagiarize is to take notes on each of your primary resources and then write the paper based on your notes, not from the references. Your paper will summarize the works of others, not directly quote from them. If you have any questions about plagiarism and correct citations, see <http://cooklibrary.towson.edu/avoidingPlagiarism.cfm> for further examples and methods to correct the problems. The consequences of cheating or plagiarism will be a failing grade of 0 points for the assignment and may result in failure of the course. 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, at a minimum, result in a failing grade of 0 for that assignment and may result in failure of the course.

Laboratory Policy for Pregnant Students

Pregnant students should consult their physicians for advice on whether to perform experiments in the laboratory. Students are encouraged to provide their physician with a list of the chemicals that they might be exposed to while in the lab. They should also check the MSDS sheets (available in the Department) to be aware of the hazards of the chemicals.

If a student is advised against performing laboratory work, then faculty must make accommodations for the student. Any accommodation should comprise a workload equivalent to the regularly scheduled laboratory work. These accommodations may include:

- performing "dry" experiments only, in a place free from exposure to ongoing experiments;
- performing the wet chemistry later;
- receiving an incomplete grade in the course pending completion of experimental work