

Instructor: *Dr. Ellen Hondrogiannis*

Office: Smith Hall 563

Phone: 410-704-5043

e-mail: EHondrogiannis@towson.edu

Office hours: By appointment through email.

Schedule: MW 10-11:50 a.m. through Webex: <https://towson.webex.com/join/ehondrog>

Course Pre- or Corequisite: CHEM 210, FRSC 367 (Please note that the fundamentals of GC/MS will not be retaught since you have learned this in FRSC 367. In this course (FRSC 467) we will apply these fundamentals to the analysis of trace evidence.)

Purpose of Course: Instruction and laboratory practice of analytical procedures used for analysis of arson, explosives and trace evidence. Laboratory work includes sample preparation and use of microscopes, FTIR, and GC/MS as well as analysis and interpretation of data. Use of conformity to standard protocols, calibration, and discriminant function analysis. **Since this course is delivered synchronously, you will be exposed to the laboratory portions through Webex and/or power points.**

Required Reading: Forensic Analysis on the Cutting Edge, Blackledge, Wiley, 2007

Course Evaluation: Three short exams given through Blackboard or Microsoft forms. These exams are closed-notes/books/resources. You are NOT allowed to use any additional resources. You will be monitored during the entire exam and your eyes are allowed to be only on the keyboard (for typing) or the screen. In addition, you are given only enough time to answer the questions. No make-up exams will be given. If you miss the exam, for whatever reason, your final exam will count a proportionately higher percentage of your grade. If the final exam is missed, your grade will be recorded as zero unless you have made prior arrangements with me or supply me with an acceptable (my decision) documented excuse.

Exams will be given at the beginning of the period. You will not be permitted to start the exam after one minute of the announced starting time. You will also not be able to take the exam later in the period.

There is also one oral presentation equivalent to an exam grade. Even though you are presenting this through Webex you are still graded, in part, on how well you can deliver the material without referring to your notes as well as on your understanding of the material. Your video must remain on during the entire presentation.

I am happy to review and adjust points if necessary up to one week after exam/assignment is returned to the class.

Course Communications:

Relevant course materials will be available on Blackboard. You are responsible for anything sent by the instructor via email or posted on Blackboard. All email communication will be sent to university email accounts; you are responsible for checking your university email account frequently. I will usually respond within 24 hours of receiving an email (48 hours on weekend).

Course Fees:

Course fees will be used to purchase reagents for the laboratories as well as gases, columns, and plasticware for the instruments.

Course Grading Standards:

| | |
|----|----------------|
| A | (94.10-100%) |
| A- | (90.10-94.00%) |
| B+ | (87.10-90.00%) |
| B | (83.10-87.00%) |
| B- | (80.10-83.00%) |
| C+ | (77.10-80.00%) |
| C | (70.10-77.00%) |
| D+ | (68.10-70.00%) |
| D | (60.10-68.00%) |
| F | (< 60.10%) |

Policy on Attendance: Attendance will not be taken. However, attending lectures is highly advantageous for learning the material and succeeding in the course especially since some material will be from handouts or notes delivered in class. If you miss a class you are responsible for obtaining all missed material from another student and are expected to come to the next class prepared.

Policy on Cheating: You may NOT use any materials when taking the exams. All exams are closed-notes/book/resources. The use of cell phones or even having your cell phone out during the exam is also considered cheating and will result in a score of zero for the exam or may result in a zero for the entire course. Cheating also includes you copying and pasting information from your computer – whether it be from a website, from your own notes, and/or from emails that other students have sent you. (If you earn a score of zero due to cheating then this score will be included in the calculation of your overall grade.) Taking the exam for another student and/or helping a student by providing answers is also considered cheating. All exams are recorded and will be reviewed to ensure all behavior during the exam is consistent with you NOT using any additional resources. If it appears that you are looking at additional resources then this will be considered cheating. Cases of academic dishonesty will be handled in compliance with the Towson University Student Academic Integrity Policy (<http://wwwnew.towson.edu/studentaffairs/policies/>). At a minimum, the penalty will be a zero for the particular exam and may also result in a zero for the entire course. If you observe another student cheating, I encourage you to let me know. I will keep your information strictly confidential. Students sharing the same “wrong” answer on an exam will both be given zeros for that exam.

Withdrawal from course: If, based on your score, at the withdrawal deadline you feel you will not pass this course then I encourage you to drop this course. This applies whether this is supposed to be your last semester or not. This will allow you to put your efforts into your other courses and then return to take this course again when you have time to learn the material. There is no curve in this class and your grade will not be changed to passing just because you need this course to graduate.

TENTATIVE LECTURE SCHEDULE (Oral presentations to be added starting 2/22) Classes will be by Webex unless I announce that there is no class in which case you will be given a reading assignment (posted on BB). All reading assignments are testable.

| Week of | Topics |
|-----------------|--|
| 1/25 | Introduction to course Attribution (Ch. 1) |
| 2/1 | Chemical Terrorism (BB) Validation Guidelines (BB) Oral presentation topic due to me by 2/4 noon. |
| 2/8 | Characterization of smokeless powders (Ch.10) Microscopic explosive analysis lab |
| 2/15 | Instrumental explosive analysis (ATR/FTIR) and GC/MS lab |
| 2/22 | Exam 1 (Wed) Flammable substance analysis Oral presentation (Mon) Joelle |
| 3/1 | Flammable substances analysis Oral presentation (Wed) Marcus |
| 3/8 | dfa; Ch. 13 optional lab day |
| 3/15 | No class– SPRING BREAK |
| 3/22 | Monday no “class”; this is a reading day. Please email me during class time with questions and I will log on for a Webex with you. dfa; Ch. 13 Oral presentation (Wed) Kaya |
| 3/29 | Exam 2 (Wed) LATOF Oral presentation (Mon) Fanta |
| 4/5 | (Monday) Last Day to Withdraw LATOF Ch. 8.7 MS/MS Oral presentation (Wed) Shawn |
| 4/12 | DART (Ch. 7) Oral presentation (Mon) |
| 4/19 | ICPMS Oral presentation (Wed) |
| 4/26 | Pepper Spray (Ch. 5) Oral presentation (Mon) Joelle ; (Wed) Max Adhesive tape analysis (Ch. 12); |
| 5/3 | Clean Ion Source – Shawn, Kaya, Kathryn, Matt Oral presentation (Wed) Matt , Kathryn Isotope Ratio MS (Ch. 15) Glass cuts |
| 5/10 | M; Last “class” email me during class time if you’d like to ask questions by webex during class time. |
| Wed 5/12 | Exam 3 (8 – 9:00 a.m.) |

Upon completion of this course, each student will:

1. Have an understanding of
 - chemical terrorism
 - validation guidelines
 - characterization methods for and various types of trace evidence.

- fire scene examination for the purpose of determining the origin and cause as well as significance of post fire indicators and fire patterns.
- the chemical composition of petroleum products
- attribution of forensic evidence.
- linear discriminant function analysis.
- laser ablation – time of flight – mass spectrometry
- inductively coupled plasma-mass spectrometry
- isotope ratio mass spectrometry

2. Be able to carry out analysis using, and evaluate data for,
 - microscopy, FTIR, and GC/MS in order to determine the type of explosive.
 - GCMS and ASTM 1618 to determine class of ignitable liquid
3. Be able to evaluate data for GC/MS testing on arson and GSR.
4. Be able to carry out discriminant function analysis (dfa) on given data and generate dfa plots, write functions, and extract relevant statistical parameters.
5. Orally present peer-reviewed literature on attribution in forensics.

Oral Presentation You are to orally present a recent peer-reviewed article dealing with attribution on one of the above topics. (Grading rubric on BB)

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 each individual 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 a classroom environment built upon the principles of mutual respect and support. Toward this end, all members participating in this course are expected to demonstrate respect for all other members of the class. If you feel these expectations have not been met, please speak with your instructor or the designated diversity liaison, [Dr. Cindy Zeller \(czeller@towson.edu\)](mailto:czeller@towson.edu).

For further information regarding the diversity and inclusion policies of Towson University, please see [Towson University's "Strategy 1:Exposure to Diversity"](#) , [the Fisher College of Science and Mathematics Diversity Action Plan](#), and the [Chemistry Department Diversity Action Plan](#).

Laboratory Policy for Pregnant Students: Pregnant students should consult their physicians for advice on whether or not 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 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 accommodations should comprise a workload that is approximately 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 at a later date;
- receiving an incomplete grade in the course pending completion of experimental work

Disabilities:

Students with approved accommodations should submit their memos to the instructor the first week of class, or as soon as possible thereafter. It is the student's responsibility to present this paperwork in a timely fashion and to follow up regarding accommodations that require instructor participation

(eg testing accommodations). If you think you need accommodations but do not yet have them, please contact Disability Support Services (410-704-2638).