Trace Evidence and Microscopy Laboratory

CHE 347
Fall 2009

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Office Hours:
By appointment ONLY.

Laboratory Description:
Pre laboratory lectures and laboratory instruction are given in trace evidence and associated analysis methods, light and polarized light microscopy. The laboratory will consist mainly of work on unknowns designed to simulate scenarios with physical evidence and to encourage thinking about the unknowns as evidentiary items. Trace evidence can be defined as those types of evidence that often require microanalysis. Implicit in the term "microanalysis" is the use of the microscope as an analytical tool. The term trace evidence is associated with physical evidence such as hairs, fibers, glass, paint, and soil.

Good laboratory procedure should be practiced as an integral part of each and every experiment. Proper technique and handling procedures of trace evidence will be demonstrated, as well as an understanding of the theoretical principles of trace analysis. Care should be exercised to avoid contamination problems. For example, pipettes should never be placed in a stock reagent bottle, and aliquots of reagents should not be returned to stock bottles. Unfortunately, some methods will require the use of toxic chemicals. The instructor prior to the use of such chemicals will discuss safety guidelines in which all students are expected to follow. In fact, each chemical used should be handled as though it is hazardous, whether or not it is known to have any risk associated with its use.

Required Materials:

Required Manual:	Quarino, L., Kishbaugh J. *Trace Evidence and Microscopy Laboratory Manual*, Fall 2009 Cedar Crest College Bookstore
Required Items:	Forensic Science Laboratory Kit Cedar Crest College Bookstore
	Laboratory Coat

Laboratory Objectives:
1. To familiarize the student with basic laboratory concepts of criminalistics and the role of a criminalist in a forensic investigation.

2. To introduce the student to light and polarized light microscopy as an analytical tool in forensic laboratory analysis.

3. To analyze different types of trace evidence typically encountered in a forensic investigation.

4. To develop good laboratory technique in the handling and analysis of trace materials.

5. To introduce the student and develop good laboratory documentation skills and proper handling of physical evidence containing trace evidence.

Laboratory Outcomes:

1. The student will understand the analyses of trace evidence and the role of a criminalist in a forensic investigation. The student will also understand the basic concepts of ciminalistics and the role that the scientific method plays in a forensic investigation.

2. The student will understand how to use light, polarized light, and spectrometric microscopy. Each student will also understand and know how to use the basic analytical measurements typically used by forensic microscopists.

3. The student will demonstrate basic competence in the analytical methods presented during laboratory exercises.

4. The student will demonstrate good documentation skills in the description of analyses and of physical evidence.

5. The student will learn and perform the descriptive parameters and techniques of analysis for different types of trace evidence.

Laboratory Assessment:

Student progress in laboratory exercises will be assessed after each exercise by reviewing the analytical data and conclusions for each exercise and by reviewing the laboratory notebook to ensure that documentation guidelines are followed. All labs will be weighed equally. Pop quizzes will be given throughout the semester on the material that will be covered in a given laboratory exercise. The quizzes will be worth 10% of the final grade. In addition, there will be a final practical examination and a written final exam. The date of the examination will be assigned by the registrar during final exam week. The final examination will be worth 20% of your final grade.

Laboratory Notebooks

All lab notebooks are to **remain in the laboratory at all times**. If the notebook is not in the laboratory at any given time a **zero** will be given for the current exercise being graded. If it is determined that incontiguous entries were made, meaning documentation occurred outside of the laboratory a zero will be given for that lab. If lab work is determined to be performed outside of the allowable laboratory times, a zero will be given for that laboratory exercise.

Quiz & Exam Policy:

A final exam time will be assigned by the Registrar's Office for final exam week (December 9^{th} – 15^{th}). Both portions of the final exam (written and practical) will be given at this time. Quizzes will be given periodically throughout the semester either announced or unannounced. Make-ups will only be given if a student has proper documentation for missing a laboratory session.

Grading Policy:
Each laboratory exercise will be graded based upon documentation skills and correctly identifying your unknown. Each laboratory exercise will be worth 100 points (50 points for unknown identification and 50 points for documentation). The laboratory final will be 250 points and will consist of practical and examination portions. Any quizzes (announce or unannounced) given during the semester will be worth 25 points. The participation grade will be a combination of your attitude toward laboratory exercises, involvement in open laboratories sessions, and your ability to listen to directions and ask questions. The breakdown of assessment is as follows:

Laboratory Exercises	60%
Laboratory Final/Practical	20%
Quizzes	10%
Participation	10%

Final Grades
Your final letter grade will be based on the following:

90-100%	A	70-77%	C
88-89%	B+	68-69%	C-
80-87%	B	60-67%	D
78-79%	C+	59% or below	F

Laboratory Attendance Policy:
Attendance for each laboratory session is mandatory. Be advised that some laboratory exercises may require more than the allotted time of the scheduled laboratory. Work will need to be finished in a scheduled open laboratory time. Laboratory work will not be done without the instructor present (or an appointed individual other than me). No independent laboratory work is allowed.

Laboratory Times:
You are expected to perform your laboratory work during your designated lab time. However, if you require additional time to finish your work in addition to the 3 hour scheduled laboratory time, you may work in the laboratory during open lab hours that will be made available to you during the week. The lab during these times will be supervised by a graduate assistant or the instructor. These open labs are the only time you are allowed to do work for this lab. Open lab hours will only be made available to you if the exercise you are currently working on demands it.

Honor Code:
Cedar Crest College students should uphold community standards for academic and social behavior in order to preserve a learning environment dedicated to personal and academic excellence. Upholding community standards is a matter of personal integrity and honor. Individuals who accept the honor of membership in the Cedar Crest College community pledge to accept responsibility for their actions in all academic and social situations and the effect their actions may have on other members of the College community.

Academic Standards of Integrity:
Incumbent from the Honor Code, academic integrity and ethical behavior provide the foundations of the Cedar Crest scholarly community and the basis for our learning personally and intellectually honest and to ensure that other students do the same. This standard applies to all academic work (oral, written, or visual) completed as part of a Cedar Crest education. Students who breach the Academic Standard of Integrity – as set forth in the types of academic misconduct specified under the Faculty Handbook, Book 4.B.2.a – are subject to sanctions imposed by an instructor, a department chair, the provost, or the Board of Trustees. Such sanctions can range from, but are not limited to, the expectation to redo an assignment, the reduction in grade for an assignment determined by the provost or the Board of Trustees, may result in suspension or expulsion from the college, or the withholding, denial, or rescinding of academic degrees.

Laboratory Protocol:
Be courteous to those around you and be aware of what is going on in the laboratory environment. Do not do anything you are unsure of, when in doubt always ask. Proper disposal and techniques are required for all students to have a successful lab. Come to laboratory prepared, which means reading the laboratory ahead of time and doing any other related reading needed to understand the methods and techniques being employed in the current laboratory session.

Disabilities:
Students with documented disabilities who may need additional accommodations should discuss these needs with their instructor during the first week of class. Students with disabilities who wish to request accommodations should contact the Advising Center.

TENTATIVE LABORATORY SCHEDULE:

Date	Laboratory Topics & Objectives
8/24	Lab Introduction, Lab 1: Microcrystalline Tests for Inorganic Ions
8/31	Lab 1 con't
9/7	No Lab
9/14	Lab 2: Refractive Index of Glass
9/21	Lab 3: Fiber
9/28	Lab 3 con't
10/5	Lab 4: Conoscopic Exams
10/12	No Lab
10/19	Lab 5 : Drug Identification
10/26	Lab 6: Hair
11/2	Lab 7: Soil
11/9	Lab 8: Paint
11/16	Lab 9: Glass Density
11/23	Lab 10: Vacuum Sweepings
11/30	Lab 10 con't
12/7	Lab 10 con't
12/6-12/15	Laboratory Final/Practical - Scheduled by the Registrar's Office