APPROXIMATE

CHEMISTRY 113

Spring 2024

Jan. 17 – Apr. 29

Forensic Science

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Syracuse University

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Note: Changes to this syllabus may occur. Please refer back to Blackboard periodically for updated information, especially as it concerns exam and lab information.

COURSE DESCRIPTION AND PREREQUISITE SKILLS: Chemistry 113, Forensic Science, is focused upon the application of scientific methods and techniques to criminal justice and the law. Recent advances in scientific methods and principles have had an enormous impact upon law enforcement and the entire criminal justice system. In this course, scientific methods specifically relevant to crime detection and analysis will be presented. No prior chemistry instruction is required or assumed but the course should appeal to those who have also had high school chemistry. Emphasis is placed upon understanding the science behind the techniques used in evaluating physical evidence. Topics included in the course are blood analysis, organic and inorganic evidence analysis, microscopic investigations, hair analysis, DNA, drug chemistry and toxicology, fiber comparisons, paints, glass compositions and fragmentation, fingerprints, soil comparisons, and arson investigations, among others.

LEARNING GOALS: Scientific methods are radically changing the landscape of our criminal justice system. Increasingly, law enforcement and legal prosecution are reliant upon often complex and detailed scientific analysis of forensic evidence. This course is intended to provide an introduction to understanding the science behind crime detection. This will be accomplished by providing a rational basis for interpreting the scientific analysis of forensic evidence and through occasional relevant case studies. Laboratory exercises will include techniques commonly employed in forensic investigations.

Specific Learning Goals: All legal systems are based upon good evidence and scientific practice. After completing this course, you should be able to:

- Understand the relationships between the law, basic science and applied science.

- Describe the role physical evidence and scientific analysis in criminal justice and how the scientific method applies to forensic investigations.
- Explain the basic scientific principles underlying the analysis of biological, chemical, physical and behavioral evidence.
- Describe the chemical structure of DNA and how forensic DNA analysis works (e.g., STR, PCR, RFLP, etc.).
- Describe biometrics and how biometric information is used in forensic science.
- Describe the aspects and principles of medicine, serology (incl. blood spatter) and toxicology involved in a medicolegal practice;
- Elaborate upon the basic concepts underlying modern atomic theory and the basic scientific principles of forensic analytical chemistry and spectroscopy/spectrometry.
- Describe the principles of firearm and impression evidence.
- Explain what is meant by the terms forensic psychology and forensic sociology and how these disciplines are employed in forensic science.

Syracuse University's Shared Competencies are six university-wide learning goals that enhance undergraduate education through an integrated learning approach. Undergraduate students develop competencies through their major degree courses, liberal arts requirements, and co-curricular experiences. The Shared Competencies enable students to communicate their learning experience, provide pathways for academic development, and integrate different aspects of a Syracuse University education and student life.

Scientific Inquiry & Research Skills: One of the foundational learning objectives in this course is to provide an overview of the use of scientific research in forensic science. This includes: application of scientific inquiry and problem-solving in various contexts, analysis of theories, replication of procedures, and rethinking existing frameworks. We will focus on demonstrating this these connections and importance to modern forensic practice explicitly in our section on toxicology and medicinal chemistry.

LECTURES: The material covered in lecture will be illustrative rather than exhaustive. *You need to read the material in the text assigned **before** the lecture.* In lecture, alternate ways of understanding the material will often be presented. The examinations, however, will cover **both the assigned text and lecture materials** (whether or not they are specifically covered in lecture). Plenty of help is available to answer questions and provide assistance with problems (see TA office hours in the student FAQ sheet on Blackboard).

Lecture times:

Sect. M001: MW 5:15 to 6:35 PM LSB 001 (Life Sciences Building)
Sect. M012: MW 3:45 to 5:05 PM LSB 105 (Life Sciences Building)

An **approximate** schedule of class lecture topics and the assigned text is included with this syllabus (please note that it is only an **approximate schedule**).

NOTE: Changes to this syllabus may be necessary. If this becomes necessary, we will let you know *via* Blackboard and email.

GRADING AND EXAMINATIONS: **All exams (for both lecture sections, M001 and M012) will be administered ONLINE through Blackboard. The exams will be available starting at 5:15 and will close at 9:00 PM. See below for more information.**

Final grades will be assigned based upon the four "hourly" exams given during the regularly scheduled class (80%) and the laboratory grade (20 %) as follows;

Four Examinations	4 x 20	=	80 %
Laboratory			20 %
			100 %

There will be NO MAKE-UP Examinations.

Exam I: **Wed., February 7th (5:15 PM): ONLINE (Blackboard).**
Exam II: **Wed., Mar. 6th (5:15 PM): ONLINE (Blackboard).**
Exam III: **Wed., April 3th (5:15 PM): ONLINE (Blackboard).**
Exam IV: **Mon., Apr. 29th (5:15 PM): ONLINE (Blackboard).**

The lectures will not meet on exam days but Wednesday evening labs WILL still meet as usual.

Any and all problems involving registration, scheduling, grade reporting or other clerical issues are best handled by emailing or talking with the undergraduate chemistry secretary, located in the Main Chemistry Office 1-014 CST (Phone: 443-2851).

For Online Exams:

Go to the assignment Folder in Blackboard for your lecture section (either M001 or M012). Click on the appropriate exam and complete it. Here are important requirements for any online exam:

- ONCE YOU START, YOU MUST FINISH THE EXAM IN ONE SITTING. You must have a good internet connection!
- If you open another window on your computer, lose internet connection, lose power on your computer or similar your exam will auto submit (**you're done**).
- DO NOT USE YOUR PHONE FOR THE EXAM, there are many problems doing this!
- You will have a maximum of 180 min. (3 hours) to complete the test once you start it (you will likely need about 1 hour to complete the exam).
- **The exam window runs between 5:15 PM and 9:00 PM (no exceptions).**
- Do not use any additional materials while taking this test. Do not use, notes, texts, internet, etc.

- The tests are all multiple choice and consist of between 20-25 questions each.
- You must to work alone.
- You can find your test score in the grading section of Blackboard after completing the exam.
- You must complete the tests **during the time assigned** – no extensions will be possible.

REQUIRED TEXTBOOKS: No textbook is required to be purchased for this course. Prof. Spencer's textbook for the course is available online *free of charge* to students in the class through blackboard (as pdf files). Other materials and labs will also be available online at the Blackboard site for the class. Labs must be downloaded and printed and brought to the lab meeting.

BLACKBOARD: Extensive use of SU's *Blackboard* course program will be made so you should become familiar with and routinely check the site for the course. The lecture notes are posted there just prior to each lecture (when possible and not precluded by privacy laws pertaining to forensic cases). Additional materials, such as the syllabus, more than half of the text chapters, POGILS, labs, announcements, interesting articles, and required supplemental materials, are also posted on the *Blackboard* site for the course.

POGILS (PROCESS ORIENTED GUIDED INQUIRY LEARNING): POGIL units are provided for *optional* self-study and review for the course during the semester. Content and process from POGILs facilitate study for the exams but will not introduce any new materials not included in the lectures. **POGILS WILL NOT BE GRADED** and are provided solely as additional practice for you.

LABORATORY: Laboratory sections for this course are:

CHE 113 M002 (lab) - W from 2:15-5:15pm in LSB 002
CHE 113 M003 (lab) - W from 2:15-5:15pm in LSB 004
CHE 113 M004 (lab) - W from 2:15-5:15pm in LSB 008
CHE 113 M005 (lab) - W from 6:45-9:45pm in LSB 002
CHE 113 M006 (lab) - W from 6:45-9:45pm in LSB 004
CHE 113 M007 (lab) - W from 6:45-9:45pm in LSB 008
CHE 113 M008 (lab) - TH from 2-5pm in LSB 002
CHE 113 M009 (lab) - TH from 2-5pm in LSB 004
CHE 113 M0010 (lab) - TH from 2-5pm in LSB 008
CHE 113 M011 (lab) – TH from 6:30-9:30pm in LSB 002
CHE 113 M013 (lab) – TH from 6:30-9:30pm in LSB 004
CHE 113 M014 (lab) – TH from 6:30-9:30pm in LSB 008
CHE 113 M015 (lab) – F from 10:35am-1:35pm in LSB 002

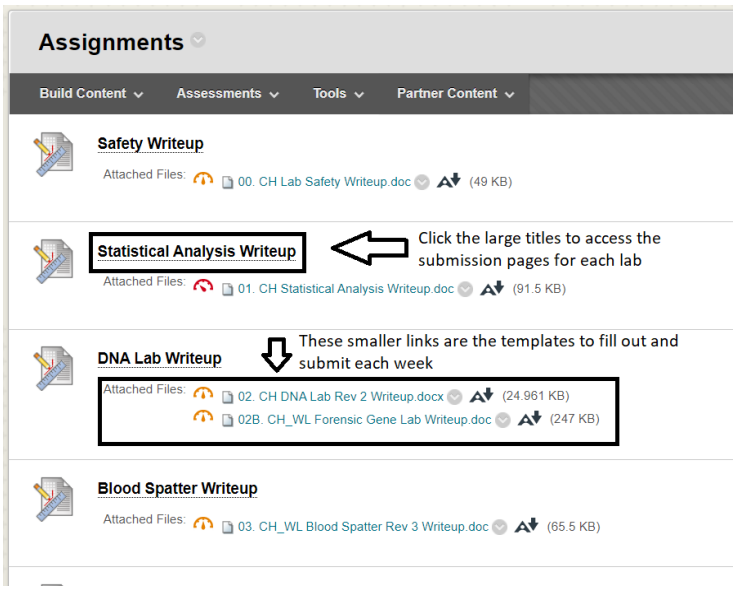
A FAQ sheet with the **names and contact information for your lab instructor** is posted on Blackboard (syllabus folder). For any questions about lab and lab grading, please contact your lab instructor directly.

There will be no Make-Up labs. In order to pass CHE 113, a student must have a passing grade in the laboratory portion of the course. Completion of the laboratory is mandatory. As stated in the schedule of courses, the laboratory periods are 3 hours in length and, while some experiments will not require the total allotted time for completion, students are expected to arrive promptly at the beginning of the lab period and not leave until that particular experiment is completed. Students that arrive too late to complete the experiment in the allotted time and those that arrive on time but depart before the experiment is completed will receive a zero for the experiment. Arranging a second "event" requiring the student's presence outside of CHE 113 laboratory during the scheduled lab period is **not allowed** by University rules. Additionally, not arriving at the lab appropriately dress for safety considerations will not be allowed into the laboratory and will receive a zero for the experiment.

CHE 113 Labs (in order):

- Safety Practices in the Forensics Lab
- Statistics Analysis Lab
- DNA: The Genetic Record Lab **AND** Identification of Unknown Restriction Enzyme Fragments of the Duchenne Muscular Dystrophy Gene (**Note**: *both labs will be done during one lab session*)
- Blood Spatter Pattern Analysis Lab
- Fingerprint Collection and Interpretation Lab, Parts I and II (**Note**: *two labs will be done during one lab session*)
- Forensic Anthropology Lab
- Separations and ID Lab
- Physical Properties of Glasses and Plastics Lab
- Forensic Entomology Lab and Forensic Toxicology (dry lab)
- Forensic Engineering Lab: Failure Analysis (Engineering a Bridge)

Lab write-ups are to be directly uploaded in Blackboard using an answer form for each lab. You should first enter your lecture course on BlackBoard (either M001 or M012) and click on the "Assignments" folder on the left sidebar. Under "Assignments", locate the lab you wish to submit, for example, the *Statistical Analysis* lab. Click the **title** of the lab to access the submission page where you can upload your document(s). Click on the smaller sub-links to access the word document templates you should use to complete the post-labs. See below for an image of the assignment folder.



For the section of Forensic Toxicology: When students complete the unit of forensic toxicology, they should be able to:

- Complete a lab assignment describing how drugs for medical practice are discovered and initially evaluated, including the roles of ethnopharmacology, serendipitous discovery, targeted design and disease mechanism interruption approaches are employed.
- Explain the scientific research and development process that typically occurs when taking a newly discovered drug from preliminary discovery, synthesis and testing through to actual medical practice, including the role of clinical trials, toxicology/dose considerations, efficacy studies, FDA regulation and related considerations;
- Discuss the need for basic and applied research in both science in general and specifically in forensic science and know the process by which research is conducted;
- Define what role bias might play in the scientific R&D process and how this might be first recognized and then effectively dealt with;

MAJOR AND MINOR IN FORENSIC SCIENCE: Both a major and a minor is available in Forensic Science. These are offered to provide students with an understanding of the fundamental concepts and principles behind the application of scientific techniques to forensic investigations and to the criminal justice system. Recent advances in basic scientific research have had a rapid and dramatic impact in these fields and it is only through an understanding of these fundamental scientific concepts that the legal system may be effective in criminal investigations.

These degree programs offer a strong complement for people interested in criminal justice to major areas of study such as anthropology, biology, chemistry, physics, geology, psychology, engineering, pre-medicine and pre-professional degree programs.

Additional degree requirements can be found at: **Forensics.syr.edu**.

ACADEMIC INTEGRITY: Syracuse University's Academic Integrity Policy reflects the high value that we, as a university community, place on honesty in academic work. The policy defines our expectations for academic honesty and holds students accountable for the integrity of all work they submit. Students should understand that it is their responsibility to learn about course-specific expectations, as well as about university-wide academic integrity expectations. The policy governs appropriate citation and use of sources, the integrity of work submitted in exams and assignments, and the veracity of signatures on attendance sheets and other verification of participation in class activities. The policy also prohibits students from submitting the same work in more than one class without receiving written authorization in advance from both instructors. Under the policy, students found in violation are subject to grade sanctions determined by the course instructor and non-grade sanctions determined by the School or College where the course is offered as described in the Violation and Sanction Classification Rubric. SU students are required to read an online summary of the University's academic integrity expectations and provide an electronic signature agreeing to abide by them twice a year during pre-term check-in on MySlice. For more information about the policy, see http://academicintegrity.syr.edu.

The Violation and Sanction Classification Rubric establishes recommended guidelines for the determination of grade penalties by faculty and instructors, while also giving them discretion to select the grade penalty they believe most suitable, including course failure, regardless of violation level. Any established violation in this course may result in course failure regardless of violation level.

DIVERSITY AND DISABILITY STATEMENT (INCLUDING DISABILITY-RELATED ACCOMMODATIONS)

Our institution values diversity and inclusion; we are committed to a climate of mutual respect and full participation. Our goal is to create learning environments that are usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your learning or accurate assessment or achievement, please notify your instructor as soon as possible. If you would like to discuss disability-accommodations or register with ODS, please visit Office of Disability Services. Please call (315) 443-4498 or email disabilityservices@syr.edu for more detailed information. ODS is responsible for coordinating disability-related academic accommodations and will work with the student to develop an access plan. Since academic accommodations may require early planning and are not provided retroactively, please contact ODS as soon as possible to begin this process.

Because of the nature of the topics covered in this class, the course readings or class discussions may generate intellectual and emotional discomfort. These responses are natural parts of intellectual growth. If, however, your emotional response becomes acute psychological distress (triggering), please communicate with me. I invite you to contact me if you have concerns in this regard.

RELIGIOUS POLICIES: SU's religious observances policy, found at supolicies.syr.edu/emp_ben/religious_observance.htm, recognizes the diversity of faiths represented in the campus community and protects the rights of students, faculty, and staff to observe religious holy days according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to a religious observance **provided they notify their instructors before the end of the second week of classes**. An online notification process is available through MySlice/Student Services/Enrollment/My Religious Observances from the first day of class until the end of the second week of class.

Accommodations only include the holiday itself and **do not** cover travel days. Accommodations and related support services such as exam administration are not provided retroactively and must be requested in advance.

DISCRIMINATION OR HARASSMENT: The University does not discriminate and prohibits harassment or discrimination related to any protected category including creed, ethnicity, citizenship, sexual orientation, national origin, sex, gender, pregnancy, disability, marital status, age, race, color, veteran status, military status, religion, sexual orientation, domestic violence status, genetic information, gender identity, gender expression or perceived gender. Any complaint of discrimination or harassment related to any of these protected bases should be reported to Sheila Johnson-Willis, the University's Chief Equal Opportunity & Title IX Officer. She is responsible for coordinating compliance efforts under various laws including Titles VI, VII, IX and Section 504 of the Rehabilitation Act. She can be contacted at Equal Opportunity, Inclusion, and Resolution Services, 005 Steele Hall, Syracuse University, Syracuse, NY 13244-1120; by email: titleix@syr.edu; or by telephone: 315-443-0211.

SUPPORTING STUDENT ACADEMIC SUCCESS: Many weekly office hours are available to provide assistance with the material presented in the class. These are posted on Blackboard (FAQ sheet in the syllabus folder) and students are welcome to attend any session. Other times can be arranged by emailing your instructors directly.

MISCELLANEOUS:

(1) Students who may need special consideration due to a physical or learning disability should see Prof. Spencer as soon as possible. **No provisions** will be made if notified **after** examinations.

(2) No student will be refused admission because he or she is unable to participate in a course requirement because of his or her religious holy day requirements. Again, you must make provisions **before** such absences. [see syllabus statement above]

(3) Excuses from class - especially lab - for medical reasons will only be given if such absences are advised by a health care provider or the Health Center based upon clinical findings and prescribed treatment recommendations. Verification must be made in writing. Such absences will be verified by the Chemistry Department staff.

(4) Attendance/participation in classes is expected. Unannounced attendance checks may be taken during the semester. Attendance/participation **will** impact your grade.

(5) This class may be using Turnitin, a plagiarism prevention system, under certain circumstances. You will have the option to submit your papers to Turnitin to check that all sources you use have been properly acknowledged and cited before you submit the paper/lab. Work may also be submitted on papers/labs that you write for this class to Turnitin, which compares submitted documents against documents on the Internet and against student papers submitted to Turnitin at Syracuse University and at other colleges and universities. We will take your knowledge of the subject matter of this course and your writing level and style into account in interpreting the originality report. Keep in mind that all papers you submit for this class will become part of the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. You will be asked in lab to sign and date a document authorizing the submission of your papers or assignments to the plagiarism detection and prevention system Turnitin.

CHEMISTRY 113 Professor James T. Spencer, S 2024
Approximate Schedule (but, only approximate),

Week	Topic	Text[1]	POGIL	Lab
WEEK 1				
Wed., Jan. 17	Introduction to Forensic Science And Evidence and the Law in Forensic Science	JTS Chapter 1	Historic Dev. of Forensic Science	None
WEEK 2				
Mon., Jan. 22	Evidence and the Law in Forensic Science and The Crime Scene and Physical Evidence I	JTS Chapters 1 and 2	Crime Scene and Physical Evidence	None
Wed., Jan. 24	The Crime Scene and Physical Evidence II Science vs. Pseudo-Science	JTS Chapter 3 and 4	Pseudo-Science	
WEEK 3				
Mon., Jan. 29	Microscopy	JTS Chapt. 5	DNA	Safety Lab
Wed., Jan. 31	Forensic DNA			
WEEK 4				
Mon., Feb. 5	Forensic DNA and Exam Review	JTS Chapt. 5		Statistics Lab
Wed., Feb. 7	**EXAM I: Exam at 5:15 ONLINE (Blackboard)**	JTS Chapt. 6		
WEEK 5				
Mon., Feb. 12	Serology	JTS Chapt. 6 and 7	Blood Typing	DNA Labs (**Note**: 2 part lab exper. in one session)
Wed., Feb. 14	Serology and External Anatomical Evidence			
WEEK 6				
Mon., Feb. 19	External Anatomical Evidence	JTS Chapt. 7	Fingerprints	Blood Spatter
Wed., Feb. 21	Internal Anatomical Evidence	JTS Chapt. 8	Forensic Anatomy	

Week	Topic	Text[1]	POGIL	Lab
WEEK 7 Mon., Feb. 26 Wed., Feb. 28	 Forensic Anthropology Forensic Ecology	 JTS Chapt. 9 JTS Chapt. 10	 Skulls, Hips and Femurs	 Fingerprint Labs (**Note**: 2 part lab exper. in one session
WEEK 8 Mon., Mar. 4 **Wed., Mar. 6**	 Forensic Ecology and Review **EXAM II: Exam at 5:15**	 JTS Chapt. 10	 From Maggots to Murder	 Anthropology Lab
WEEK 9 Mon., Mar. 11-15	 Spring Break – No Classes (Mar. 13 - 19)			 No Labs
WEEK 10 Mon., Mar. 18 Wed., Mar. 20	 Overview of Forensic Chemistry and Forensic Spectroscopy Toxicology/Medicinal Chemistry	 JTS Ch. 11.1-11.2, JTS Ch. 12 JTS Chapt. 13	 Chromatography and Spectroscopy	 Separations/ID Lab AND Answer sheet for Toxicology
WEEK 11 Mon., Mar. 25 Wed., Mar. 27	 Toxicology/Drug Development/Medicinal Chem. Explosives and Arson	 JTS Chapt. 13 JTS Chapt. 14	 Medicinal/Tox Soil, Residue and Paint	 Density and Refractive Index Lab
WEEK 12 Mon., Apr. 1 **Wed., Apr. 3**	 Chapter 14 and Review Session for exam **EXAM III: Exam at 5:15 for all lecture classes.**	 JTS Chapt. 14	 Arson and Explosives	 Forensic Entomology and **Forensic Toxicology** (dry lab)
WEEK 13 Mon., Apr. 8 Wed., Apr. 10	 Mineralogical, Soil, Residue and Paint Overview of Physical Measurements	 JTS Chapt. 15 JTS Chapt. 15	 Overview of Physical Measurement	 Forensic Engineering: Failure Analysis

WEEK 14 Mon., Apr. 15 Wed., Apr. 17	 Firearms and Ballistics Forensic Document, Audio, Photographic, and Video Analysis	 JTS Chapt. 16 JTS Chapt. 17	 Handwriting and Voice	 All Lab Reports Due

Week	Topic	Text[1]	POGIL	Lab
WEEK 15 Mon. Apr 22 Wed., Apr. 24	 Forensic Psychology Review for Exam	 JTS Chapt. 19		
WEEK 16 **Mon. Apr. 29**	 **EXAM IV: Exam at 5:15 for all lecture classes.**			

Exams:

Exam I: **Wed., February 7th (5:15 PM): ONLINE (Blackboard).**
Exam II: **Wed., Mar. 6th (5:15 PM): ONLINE (Blackboard).**
Exam III: **Wed., April 3th (5:15 PM): ONLINE (Blackboard).**
Exam IV: **Mon., Apr. 29th (5:15 PM): ONLINE (Blackboard).**

Exam Rules:

- ONCE YOU START, YOU MUST FINISH THE EXAM IN ONE SITTING. You must have a good internet connection!
- If you open another window on your computer, lose internet connection, lose power on your computer or similar your exam will auto submit (you're done).
- DO NOT USE YOUR PHONE FOR THE EXAM, there are many problems doing this!
- You will have a maximum of 180 min. (3 hours) to complete the test once you start it.
- **The exam window runs between 5:15 PM and 9:00 PM (no exceptions).**
- Do not use any additional materials while taking this test.
- The tests are all multiple choice and consist of between 20-25 questions each.

- You must to work alone.
- You can find your test score in the grading section of Blackboard after completing the exam.
- You must complete the tests **during the time assigned** – no extensions will be possible.

Chemistry 113 LABORATORY

Safety is the MOST important issue that you will deal with this semester. Take the laboratory and its risks seriously. Understanding these risks and minimizing them is the best way to avoid accidents. If you follow these guidelines and stay alert to possible hazards, your experience in this course should be a safe and productive one.

SAFETY GLASSES MUST ALWAYS BE WORN IN LAB!!

Rules and Regulations

1. You will work in pairs in the laboratory, but you are required and responsible for doing your own laboratory write-up.

2. Students are expected to complete their lab on their assigned day and hand-in the laboratory write-up at the beginning of the following laboratory. If a student wants to switch days one week, permission must be obtained from one of the TAs at least one week before the scheduled lab.

3. CHE 113 laboratory is scheduled for 3 hours. Attendance is mandatory. Each student is expected to present at the start of the laboratory, during this time the experimental set-up and safety procedures for each lab is discussed by the TAs. Students who show up late will be penalized.

4. A student may leave the laboratory after completing the experiment, clean-up, and the laboratory write-up (making sure to have each lab initialed and dated by a TA before leaving or it will be considered late).

5. Leaving early before completing the laboratory will result in a grade of zero for the experiment. The student is reminded that committing to another course, internship, etc. which overlaps the CHE 113 lab is a violation of University regulations.

6. Late labs will be penalized. After five days you will receive a zero for the lab.

7. Each person is responsible for wiping down his/her work area with a damp sponge or paper towel and washing all glassware with soap and water at the end of each lab period.

8. If you are in violation of any safety guidelines, you will be asked to remedy the situation only once. The next time you will be asked to leave lab for that day. There will be no make-up labs.

Safety Guidelines

1. Safety glasses must be worn at all times while in lab. You will be given one warning. If it happens a second time you will be asked to leave lab and you will receive a zero for the lab.

2. Do not wear contacts in lab. Wear your glasses.

3. If glassware breaks and/or chemicals spill, inform the TA. Do not try and clean the spill and/or glass yourself.

4. If you cut/burn yourself and/or spill anything on your clothing and/or skin in lab, inform the TA immediately.

5. Long hair must be tied back.

6. Avoid wearing loose clothing and jewelry.

7. Wash your hands before leaving lab and going to the bathroom.

8. Do not sit on the lab benches.

9. Do not eat or drink in lab at any time.

10. No open-toed shoes, sandals or shorts may be worn in lab at any time.

11. Use the disposable gloves provided when required and change them frequently.

Hazards - The main potential hazards in the laboratory are fire and exposure to toxic and/or reactive substances. Though toxicity and reactivity of compounds varies tremendously, an excellent policy is to handle EVERY chemical with respect and caution. Be aware that you may be exposed to chemicals in several ways: inhalation, skin contact (some chemicals go right through the skin), and ingestion.

In case an accident occurs, report it immediately! Do not try to hide anything out of embarrassment - you will be making the situation worse, endangering yourself and others. Let the instructors decide on the proper course of action. Those not involved should clear the area.

The following is taken in part from "The Organic Chem Lab Survival Manual", by James W. Zubrick. Please excuse the jokes he uses, I will not claim any responsibility for them.

SAFETY FIRST, LAST, AND ALWAYS

Disobeying safety rules is not at all like flouting many other rules. You can get seriously hurt. No appeal. No bargaining for another 12 points so you can get into medical school. Perhaps as a patient, but certainly not as a student.

1. Find out how you would get medical help, if you needed it. (The stockroom has limited first aid; otherwise have your T.A. call the Health Center.)
2. Always wear your goggles. Eye injuries are extremely serious, but they can be mitigated or often prevented if you keep your goggles on at all times. There are several types of eye protection available, some acceptable, some not, according to the local, state, and federal laws. I like the clear plastic jobbers that leave an unbroken red line on your face when you remove them. Sure they fog up a bit, but the protection is superb. Also, think about getting chemicals, or chemical fumes trapped under your contact lenses. Then don't wear them to lab. Ever.
3. Touch not thyself. Not a biblical injunction, but a bit of advice. You may have gotten chemicals on your hands, in a concentration that is not noticeable. Sure enough, up go the goggles for an eye wipe with the fingers. Enough said.
4. There is no "away". Getting rid of chemicals is a very big problem. (Throw all waste in appropriately labeled jars)
5. Bring a friend. If you have a serious accident when you are all by yourself, you might be unable to get help before you fall over. Don't work alone; don't work at unauthorized times.
6. Don't fool around. Chemistry is a serious business. Don't be careless or clown around the lab. You can hurt yourself or other people. Try not to be somber about it; just serious.
7. Drive defensively. Work in the lab as if someone else were going to have an accident that might affect you. Keep the goggles on because someone else is going to point a loaded, boiling test tube at you. Someone else is going to spill hot, concentrated acid on your body. Get the idea?
8. Eating, drinking, smoking in the lab. Are you kidding? Eat in a chem lab?? Drink in a chem lab??? Smoke, and blow yourself up!!!!
9. Keep it clean. Work neatly. You don't have to make a fetish out of it, but try to be neat. Clean up spills. Turn off burners or water or electrical equipment when not in use.
10. Where it's at. Learn the location and proper use of the fire extinguishers, fire blankets, safety showers, and eyewashes.
11. Make the best-dressed list. No open-toed shoes or sandals. No loose-fitting cuffs on pants or shirts. Keep the midsection covered. Tie back that long hair. A small investment in a lab coat can pay off, projecting that professional touch. It gives a lot of protection.

ACCIDENTS WILL NOT HAPPEN

That's the attitude you should hold while working in the laboratory. You are NOT going to do anything, or get anything done to you, that will require medical attention. If you do get cut, and the cut is not serious, wash the area with water. If there's serious bleeding, apply direct pressure with a clean, preferably sterile dressing. For a minor burn, let cold water run over the burned area. For chemical burns to the eyes or skin, flush area with lots of water. In every case get to see a physician.

If you have an accident, tell your instructor immediately. Get help! This is no time to worry about your grade in lab. If you put your grades ahead of your personal safety, be sure to see a psychiatrist after the internist finishes.