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**CHE 113: Forensic Science
(Fall 2023-24) (Full Year)**

**Instructor: General Chemistry Professor James T. Spencer**

**Adjunct Professor: Ronald Johnson**

**Email: rjohnson@alcsny.org**

**Class Time: 8:45-9:31 M-F**

**COURSE INFORMATION**

*Syracuse Website at:* [Syracuse University Project Advance](https://supa.syr.edu/)

**Course Description and Prerequisite Skills:**

Chemistry 113, Introduction to Forensic Science, is focused upon the application of scientific methods and techniques to crime and law. Recent advances in scientific methods and principles have had an enormous impact upon science, 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 had high school chemistry. Emphasis is placed upon understanding the science underlying the techniques used in evaluating physical evidence. Topics included are blood analysis, organic and inorganic evidence analysis, fingerprints, hair analysis, DNA, drug chemistry, forensic medicine, forensic anthropology, toxicology, fiber comparisons, soil comparisons, and fire and engineering 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.

**Required Text:**

*Introduction to Forensic Science: The Science of Criminalistics* by James T. Spencer from Cengage Learning textbook.

**Lectures:**

Attendance at lecture is required at every session, whether in person or online. The material covered in lecture will be illustrative rather than exhaustive. *You should 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. 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**).

**SUPA Grading and Examinations:**

Final grades will be assigned based upon the several Class exams given during the regularly scheduled class (50%), the comprehensive final examination (25 %), and the laboratory grade (25 %) as follows;

 Class Examinations = 50 %

 Final Examination 25 %

 Laboratory 25 %

 100%

*Note: There will be* ***no makeup*** *examinations.*

**ALCS Grading and Examinations:**

Final grades will be assigned based upon the average of all four Quarters of the school year.

Quarter 1 = 20%

Quarter 2 = 20%

Quarter 3 = 20%

Quarter 4 = 20%

Final Exam = 20%

Each quarter is calculated from the given regularly scheduled classwork (15%), the Unit Tests (70 %), and the laboratory grade (15 %) as follows;

 Classwork = 15 %

 Unit Tests 70 %

 Laboratory 15 %

 100%

**Laboratory:**

In order to pass CHE 113, a student must have a passing grade in the laboratory portion of the course. Completion of all of the laboratory exercises is expected and required. 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. Students who feel unwell should refrain from attending class in person in adherence to the University’s Stay Safe Pledge. Online students should complete the “at home” laboratory exercises as directed by the instructor.

**Attendance and Participation Policy:**

1. Students who may need special consideration due to a physical or learning disability should see the instructor as soon as possible. **No provisions** will be made if notified **after** examinations.
2. Excuses from class or 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 **may** be verified.
3. Attendance in classes is expected. Unannounced attendance checks may be taken during the semester.
4. Remote learning will only be offered if one is under a mandatory quarantine by NYS Dept. of Health. I will provide Live streaming and or recorded lessons for individuals in quarantine via TEAMS Video.

**Syracuse University Policies**

**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 a signature agreeing to abide by them. For more information about the policy, see <http://class.syr.edu/academic-integrity/policy/>.

**Related links** Academic Integrity Policy Violation and Sanction Classification Rubric:<http://class.syr.edu/wp-content/uploads/2017/08/Academic-Integrity-Policy-Violation-and-Sanction-Classification-Rubric_final.pdf>

What Students Need to Know about Academic Integrity:

<http://class.syr.edu/wp-content/uploads/2018/08/What-Students-Need-to-Know-About-Academic-Integrity-8.6.18.pdf>

**Academic Accommodations:**

Syracuse University welcomes people with disabilities and, in compliance with the Rehabilitation Act of 1973 and the Americans with Disabilities Act, does not discriminate on the basis of disability.  Students who require special consideration due to a learning or physical disability or other situation should make an appointment with the course instructor as soon as possible.

# AIS LEVELS

Students identified by their teachers as being in need of academic intervention services will be recommended for these services according to the level of service needed. The following general guidelines should be helpful as teachers list the intensity of intervention recommended.

**LOW LEVEL INTENSITY :**

Needs individual or small group intervention in the classroom.

**MIDDLE LEVEL INTENSITY :**

Needs above services in addition to occasional pull-out or push-in intervention services by teachers assigned to such duty.

**HIGH LEVEL INTENSITY :**

Needs all the above services on a regularly scheduled basis, with greater frequency than those above.

The following staff are responsible for reporting progress that results from academic intervention services:

 -Unless someone else is directly providing assistance, classroom teachers in the four content areas mandated for AIS must complete progress reports.

**ACADEMIC INTERVENTION SERVICES (AIS)**

In order to provide services to students identified as needing them, please proceed as follows:

1. Send a parent notice. (Committee)

2. Provide academic intervention.

 - Depending on the level and area of need, incorporate strategies for improvement intended to reduce risk.

3. Log progress according to level of intervention.

 - AIS progress reports are to be available at the end of each marking period.

**THE FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT (FERPA)**

The Family Educational Rights and Privacy Act (FERPA) sets forth requirements regarding the privacy of student records. FERPA governs both the access to and release of those records, known as education records, and the information they contain. Under FERPA, faculty have a legal responsibility to protect the confidentiality of student records. For additional information about FERPA and Syracuse University’s FERPA policy, see Compliance with the Family Education Rights and Privacy Act or contact the SU Office of the Registrar (315.443.3535).

**ONLINE ETIQUETTE**

Students participating remotely in class sessions are participating on an equal basis as the students who are attending class sessions in-person in the classroom. Online instruction will require the same level of quality work as is typically expected from students in a traditional classroom setting. You will need to devote your self-motivated attention and work to the course as motivated self-learners. The course involves a significant amount of reading, watching videos and timed examinations, often with specific due dates. Make a schedule, keep yourself to it and work hard.

**If this course is online, students are expected to follow the guidance detailed below:**

1. In an effort to build community and connect with each other and the facilitators, **all participants must have the camera on their device turned on for the full duration of the synchronous sessions.** Please be in a chair or similar environment (*e.g*., not at the pool, in bed, etc.) - professionalism has a place in forensic science and in this course.
2. Participants should keep their microphone on mute unless they are verbally participating in order to minimize background noise.
3. Online instruction represents a class setting and students should respectfully share turns speaking, as well as respectfully engage in dialog around the topics in the course.

Participants should test their audio, video, and internet browser capabilities prior to weekly synchronous sessions. Technical difficulties should be brought to the attention of the school district’s ITS Department.

Additionally, you may wish to refer to the ‘Netiquette for Students’ resource at Syracuse University’s ITS Answers page: [https://answers.syr.edu/display/AC/Netiquette+for+Students](https://answers.syr.edu/display/AC/Netiquette%2Bfor%2BStudents).

**USE OF CLASS MATERIALS AND RECORDINGS**

Original class materials (handouts, assignments, tests, etc.) and recordings of class sessions are the intellectual property of the course instructor. You may download these materials for your use in this class. However, you may not provide these materials to other parties (e.g., web sites, social media, other students) without permission. Doing so is a violation of intellectual property law and of the student code of conduct.

**Student Work:**

It is understood that registration for and continued enrollment in this course constitutes permission by the student for the instructor to use for educational purposes any student work produced in the course, in compliance with the federal Family Educational Rights and Privacy Act (FERPA).  After the completion of the course, any further use of student work will meet one of the following conditions: (1) the work will be rendered anonymous through the removal of all personal identification of the student(s); or (2) written permission from the student(s).

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| IR Heroin | **Introduction to Forensic Science: The Science of Criminalistics***James T. Spencer, Syracuse University* |  |

 \*Labs are subject to change

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| Section 1 | Topic | Text | Lab |
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CH**E 113 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 end of the laboratory that same day. If a student wants to switch days one week, permission must be obtained from one of the instructors 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 instructors. Students who show up late will be penalized.

4. A student may leave the laboratory after completing the experiment, cleanup, and the laboratory write-up (making sure to have each lab initialed and dated by an instructor 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 instructor. 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 instructor 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.

**LABORATORY SAFETY NOTES**

**Chemistry 113**

**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!!**

**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.