Riverside City College
Administration of Justice Program

Mike Joyce Criminalistics Learning Laboratory (QD16)

Safety, Security & Policies Manual

Effective:	November 30, 2017
Revision Date:	August 2023 (Revision 5.0)
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RCC
RIVERSIDE CITY COLLEGE

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Section 1 – Safety Philosophy

The Administration of Justice Program at Riverside City College has a responsibility to create a safety philosophy for all faculty, staff, and students spending any time within the Criminalistics Learning Laboratory.

- Safety in the educational laboratory is the priority.
- The school, faculty, employees, and students are responsible for preventing injuries.
- Working safely should be a requirement for proper faculty performance.
- Prevention of injuries is vital.
- An annual safety audit is essential.
- Any deficiency should be corrected in a timely and appropriate manner.
- Establishing a priority on safety will benefit students throughout their educational and professional careers.

Any faculty members teaching courses within the criminalistics learning laboratory and using any equipment or supplies should be provided this document to read carefully.

Section 2 - Introduction

A significant amount of the information included within this manual was derived from the Drug Enforcement Administration's "Safety in the Laboratory" policies, the Houston Police Department's crime laboratory safety manual, and information obtained from the State of California's Department of Justice, the California Criminalistics Institute, the Bureau of Forensic Services, and the California Crime Laboratory Review Task Force.

The Criminalistics Learning Laboratory, located in Room QD16 on the Riverside City College campus, is dedicated to the memory of Mike Joyce, a former faculty member in the Administration of Justice Program at RCC. Starting in 2017, the criminalistics learning laboratory required a significant amount of work to bring the learning environment to a level of basic safety and educational compliance. This work, completed by Assistant Professor Melissa Matuszak, PhD, included the creation of a MSDS binder, inventory, incident reporting system, safety agreements, and this manual. All of the effort was to establish a viable safety program that would raise the standards and performance for faculty and students within the criminalistics learning laboratory as well as provide an environment where ADJ students would learn skills and safety practices that would transfer directly into a professional environment.

The expectation in any educational or professional laboratory environment is that each individual present is responsible for their own safety and the safety of others, as well as incurring the responsibility to report all health and safety hazards and to ensure that all individuals present observe proper safety procedures. All faculty, staff, and students should have the responsibility to comply with the safety program, to take the necessary precautions to protect themselves and others, and to immediately bring any potential safety concerns to the attention of the laboratory coordinator or director.

An effective safety program should reduce the potential for accidents, injuries, and health problems. In addition to a copy of the manual provided to every faculty member teaching a course that utilizes criminalistics equipment in QD16, a complete copy will also be kept in QD16, with the laboratory coordinator, on file with the Behavioral Sciences Department Chair, and on file with the College Safety & Emergency Planning Coordinator. These documents, along with other safety resources, should be maintained in a designated area in the laboratory and accessible to all employees.

Objectives

These guidelines are intended to provide established minimal practices for all laboratory personnel. These guidelines should serve as a reference and a constant reminder of the need to work safely. The safety program objectives include:

- To promote and maintain the well-being of all faculty, staff, and students within the criminalistics learning laboratory by the prevention of occupational accidents, injuries, and illnesses.
- To identify and eliminate hazards that endanger the health or safety of faculty, staff, and students.
- To reduce misinformation or confusion regarding safety resources or proper safety measures.
- To develop safety conscious faculty, staff, and students through participation.

Furthermore, while there is no accreditation agency or board for undergraduate learning laboratories, there are accreditation agencies for professional crime labs. Utilizing standards established by accredited departments and introducing those standards to the students at RCC would arguably provide the Administration of Justice students attending criminalistics courses the safety and procedure foundation that would provide more professional opportunities and applicable discipline skills.

The State of California's crime laboratories have various professional accreditations relating to the forensic field, with a focus on the laboratory accreditations provided through ANSI-ASQ's ANAB. ANAB is the ANSI-ASQ National Accreditation Board, which is the combined effort of the American National Standards Institute (ANSI), the American Society for Quality (ASQ), and the American Society of Crime Laboratory Directors (ASCLD) International. This manual has reviewed the various standards and expectations of crime lab accreditation, in order to align certain safety procedures and skills implemented on the RCC campus. This objective was completed to allow for students enrolled in the course to ensure their classroom experience could translate directly into an applicable discipline and also ensures that the student learning outcomes (SLOs) within the course meet field and agency best practices.

Section 3 – Safety Responsibilities (Instructor)

The instructor within a criminalistics learning laboratory course has a responsibility to supervise and maintain a safe environment for all students and other faculty present within the learning laboratory. The courses that currently meet the definition of criminalistics learning laboratory courses are:

ADJ12	Introduction to Criminalistics	(3 units) 54 Hours Lecture/12 Hours Lab
ADJ13	Criminal Investigations	(3 units) 54 Hours Lecture
ADJ14	Advanced Criminal Investigations	(3 units) 54 Hours Lecture/12 Hours Lab
ADJ27/PHO27	Forensic & Crime Scene Photography	(3 units) 36 Hours Lecture/54 Hours Lab
ADJ31	Cybercrime & Digital Forensics	(3 units) 54 Hours Lecture/12 Hours Lab

It should also be the instructor's responsibility to notify the learning laboratory coordinator if any safety concerns or security issues become apparent or present during the course of a class or semester. The expectation should be that within 2 business days the instructor will notify the coordinator and the coordinator will respond and begin the process of looking into any safety issue.

The coordinator and criminalistics instructors should conduct a meeting at least once every 6 months (2 times annually), or whenever necessary, to review any accident reports and requests for change in existing safety and wellness practices. The coordinator will then issue a written statement regarding the results of the meeting to the Department Chair and campus Safety Officer for a review of proposed changes or requests. The department Chair and safety officer may also be present during the review meeting.

The criminalistics learning laboratory could benefit from the implementation of a dedicated coordinator position, responsible for inventory, ordering, maintenance of compliance issues, and assistance with the faculty during recruitment events through RCC, mock crime scene finals in ADJ13 and ADJ14, laboratory scenarios in ADJ12, ADJ13, ADJ14, ADJ27, and ADJ31, and the grave excavation final in ADJ14 at Ben Clark Training Center.

The coordinator should also complete quarterly safety inspections and audits of the learning laboratory, maintain all records of laboratory safety inspections, to provide training to any new faculty or employee regarding the laboratory equipment and safety procedures, and to take immediate and corrective action in response to any unsafe act or condition. The coordinator position should also be responsible for notifying appropriate college and district resources and professionals of:

- Laboratory inventory
- Laboratory safety audits
- Accident reports
- Accident report investigations and follow ups
- Quarterly laboratory safety audits and subsequent results

- Purchasing requests
- Equipment maintenance schedules
- Equipment maintenance issues
- Quarterly inventory updates
- Equipment purchase requests
- Materials purchase requests

All new faculty and employees that will be working within the criminalistics learning laboratory must read the following prior to the first day of working in the laboratory setting with students present:

- ☐ Criminalistics Learning Laboratory Student Equipment Agreement
- ☐ Criminalistics Learning Laboratory Incident Report Forms
- ☐ Criminalistics Learning Laboratory Safety, Security, & Policies Manual
- ☐ Criminalistics Learning Laboratory Equipment Loan Agreement

All new faculty and employees should also be provided an introductory tour to the learning lab, in order to learn the location of pertinent safety equipment, including first aid kits, fire extinguishers, personal protective equipment, and other relevant items.

Section 4 – Safety Responsibilities (Students)

Each student enrolled in a lab course, who will be completing laboratory work, or utilizing any equipment or materials from within the criminalistics learning laboratory should be required to read through the Student Equipment Agreement form. Instructors can choose to ask for students to initial that they understand the basic responsibilities of each student to maintain safe practices within the learning laboratory.

The safety guidelines for students during laboratory work includes:

- ☐ I understand it is my responsibility to practice safety and awareness while on scene, while in the classroom, and while in the lab. I will ensure I am wearing proper personal protective equipment and am using equipment properly and respectfully.
- ☐ I will follow all directions given to me by the professor during lab work.
- ☐ If any incident, injury, or equipment malfunction occurs during lab work, I will immediately notify the instructor and complete an incident report. I understand there may be serious consequences for failing to report an incident or failing to complete an incident report.
- ☐ I will abide by all safety protocols when handling ballistics and training weapons. I will not point any weapon at another person and will handle each training/scene weapon as if it were real and capable of causing injury.
- ☐ I will sign out all equipment needed during lab or scene work and will return it at the end of the class period in the same manner in which I received it. This means I agree to clean any lab equipment or materials used prior to returning it to the professor.

- ☐ I will not eat or drink anything or bring any food or drink into the lab during experiment lab time.
- ☐ I will respect the space of my fellow classmates and will ensure I provide ample room for myself and others when completing lab work.
- ☐ I am aware of the MSDS binder and how to locate and use the information provided within if there is a potential hazard or exposure to chemical or other material in the lab.
- ☐ I am aware that MSDS information is also available on Dr. Matuszak's website and I know how to access this information.
- ☐ I am aware of the location of the criminalistics laboratory policy and procedure manual.
- ☐ I am aware that the lecture material and lab work can be graphic in nature and will provide advance notice to the professor if I am struggling with the material or have concerns with my ability to perform well.
- ☐ I will alert the professor as soon as possible if I am unable to follow any of the requirements when I attend class.
- ☐ I am aware of the location of a first aid kit.
- ☐ I am aware of the location of the fire alarm or fire extinguisher.
- ☐ I am aware of the location of the emergency eye wash station.
- ☐ I will not use any electrical outlets in the lab unless specifically instructed by the instructor. This includes plugging equipment in or removing plugs already inserted into the outlet.
- ☐ I am aware of the emergency procedures and evacuation process for the lab.
- ☐ I will dress appropriately during lab and scene work. This means:
    - Long hair will be pulled out of the face and eyes.
    - No rings, bracelets, dangling earrings or other jewelry will be worn during lab work.
    - I am aware closed toe shoes may be required for some lab and scene work.
    - I will dress for the weather during scene work to ensure safety.
    - I will not be wearing headphones or other equipment that will prevent me from hearing instructions from the professor.
- ☐ I will place my cell phone on silent during lab and scene work. I will not answer my phone or touch it while wearing any personal protective equipment in order to prevent evidence transfer or contamination. I understand this may also apply to other personal electronics.
- ☐ I understand some equipment in this lab requires specialized training or awareness and I will not attempt to use or operate any equipment I have not been trained on.

There is also an expectation that the responsibility for reporting any safety issue, incident, or accident is upon the student if the student is involved, and that the student will notify the instructor and school as soon as it is safe and possible in order to begin the incident reporting process.

Section 5 – Safety Inspections

The criminalistics learning laboratory coordinator, or faculty teaching the criminalistics courses (ADJ12, ADJ13, ADJ14, ADJ27, ADJ31) should conduct safety inspections quarterly to ensure compliance with safety guidelines, school policies, and discipline best practices. The safety inspection should consist of visual inspections of each section of the learning lab, as well as a review of the lab safety manual, any

accident or incident reports, and communication/feedback with the college district's safety officer or equivalent.

During the inspection, any hazard or violation should be reported in writing to the responsible party (department Chair and/or safety officer) for evaluation and further corrective actions, if deemed necessary.

Safety inspection program records shall include the following areas:

- Fire extinguishers; inspected annually, visually inspected quarterly.
- Fume hoods inspected quarterly
- Microscopes inspected quarterly
- Use of issued and available safety equipment inspected quarterly
- Laboratory emergency evacuation procedures inspected quarterly
- Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) reviewed and inspected quarterly
- Spill clean-up kits available and current; inspected quarterly
- Broken glass, sharps, and biohazard waste boxes available with proper disposal; inspected quarterly
- First aid kits available, current, and stocked; inspected quarterly
- Chemical storage procedures; inspected quarterly
- Medical emergency and incident reporting procedures available; inspected quarterly
- Access control to storage areas; reviewed quarterly
- Materials storage and applicable materials expiration dates/disposal; reviewed quarterly

The following areas should be inspected and reviewed annually by the lab coordinator and other relevant personnel:

- Air quality; once per year
- Electrical equipment; once per year
- Power stations, power cords, wiring; once per year
- Emergency lighting; once per year
- Access control to room; once per year

These inspections or audits should be documented with the Safety Inspection Checklist, which can be found in hard copy within the laboratory paperwork area or can be found in digital form from Dr. Matuszak and/or the lab coordinator.

Section 6 – Biological and Chemical Contamination

Students participating in learning laboratory exercises in a forensic setting may be exposed to substances that are toxic, carcinogenic, or otherwise hazardous to humans. While every effort will be made by the laboratory and the faculty to prevent any exposure, the reality of forensic settings is that

professionals, and aspiring professionals including students, may have to handle hazardous materials in the pursuit of learning proper forensic skills and techniques as well as the development of safety-related skills.

The hazards of biological and chemical samples will vary according to (1) the nature and concentration of the infecting agent, (2) the routes of exposure: i.e. absorption, direct inoculation, vectors, and injection, and (3) the susceptibility of the exposed student or faculty member. Each sample must be considered to be a potential hazard and handled appropriately to protect the student or others in the immediate vicinity from contamination.

Common Routes of Contamination

Absorption

Open cuts or scratches on the skin, particularly the hands, provide a point of entry for infectious agents. Penetration of intact skin is possible by some infecting agents and chemicals, while others may enter through the conjunctiva of the eye or other mucous membranes as a result of contact with contaminated hands.

Direct physical contact by handling wet or dry samples (since physiological stains should be regarded as potentially infectious), as well as the splashing of liquids, is a frequent means of contamination.

Direct Inoculation

Broken glassware, needles, syringes, forceps, staples on packaging materials, and other sharp objects provide a direct means of injection of infecting agents into the bloodstream. In a criminalistics learning laboratory setting, no actual biological material beyond saliva and sweat should be used, it will limit potential exposure, but the use of items listed within does still present a hazard.

Vectors

Ticks, fleas, body lice, and other ectoparasites are potential sources of contamination.

Ingestion

Smoking, eating, or dirnking after handling hazardous materials or specimens and prior to hand washing may result in oral ingestion. Mouth pipetting, placing objects such as pens and pencils in one's mouth, or hand contact with mucous membranes, like rubbing one's eyes, may also result in contamination.

Aerosols

Infectious agents may become airborne through a variety of laboratory procedures or accidents; e.g. spills, clean up of spills, broken containers, centrifuging, Pasteur pipette transfer and mixing, sample

homogenizing, splashing liquids, flaking material from dried stains, removing caps or stoppers from tubes. When involved with any of the above situations or while using any aerosol or spray, proper ventilation and/or breathing protection is imperative.

In a criminalistics learning laboratory, this involves the appropriate use of fume hoods and breathing protection, especially when utilizing aerosol chemicals or other substrates often used in crime scene investigation for forensic applications, e.g. luminol, hairspray, etc.

Radiation

Energy from various instruments used in the learning laboratory may present a special danger to skin and eyes. Protective glasses should be worn to guard against ultraviolet, infrared, or laser light radiation.

Section 7 – Laboratory Safety

- Alertness for an individual's own safety and that of their classmates/instructors should be remembered at all times.
- Eating and drinking in the criminalistics learning laboratory is prohibited.
- Personal protective equipment should not be worn outside of the laboratory.
- The criminalistics learning laboratory is a place for serious work.
- Do not run in the laboratory.
- Smoking is prohibited; this includes the use of other tobacco products including smokeless tobacco (i.e. dip), and vaping.
- No students in the criminalistics learning laboratory should plug or unplug any item in any wall socket within the laboratory unless directly advised to do so by the instructor.
- All students need to be advised of safety practices and potential hazards associated with equipment or chemicals.
- Only students registered in the course, under the supervision of the instructor, should participate in any laboratory work.
- Any non-registered individual should not be present, unless escorted by the instructor, in the criminalistics learning laboratory during lab work.
- Do not stand on chairs, boxes, drawers, or other improvised platforms. If extra height is needed, obtain a stepladder.

- Use an approved ladder for placing materials on or removing materials from high shelf locations.
- Avoid carrying excessively heavy or bulky loads. Ask for assistance when needed.
- Do not lean back in a chair and/or prop feet off the floor.
- Do not sit on the desks or tables in the learning laboratory.
- Do not leave desk drawers or storage cabinet doors open.
- Any equipment, supplies, or evidence stored above the cabinets shall provide a minimum 18 inches of clearance from the ceiling.
- Approach any blind corner with caution.
- Do not carry sharp objects, such as pencils, pens, drafting tools, scalpels, sharps, etc., in pockets, over ears, in teeth, or carelessly in hand.
- Scalpels and Exacto knives are not to be left loose in drawers or kept with pens and pencils.
- Use staplers, paper cutters, scissors, and knives with care to avoid serious cuts or injury.
- Keep all points of entry and exit into and out of the learning laboratory free from any impediment or obstruction.
- Keep aisles clear of any obstacle, including chairs, backpacks, etc.
- Keep personal protective equipment clean and orderly.
- Immediately handle spills or accidents; clean up spilled liquids or collect shattered items.
- All chemical and biological spills should be immediately neutralized and cleaned up.
- Properly dispose of all items, including chemicals.
- Work surfaces should be cleaned immediately after use.
- Personal protection equipment, including safety goggles, particle masks, shields, gloves, aprons, etc., should be used when working in the criminalistics learning laboratory. When in doubt, use the maximum protection available.
- Appropriate shoes should be worn in the laboratory environment. This includes shoes that enclose the foot. Open-toed shoes are not permitted during lab work.
- Warn nearby students when potentially hazardous materials are being handled.

- Always use a fume hood when potentially hazardous gases, chemicals, solvents, fumes, mists, smokes, aerosols, dust, etc., are involved in a mechanical or chemical procedure.
- Never taste chemicals, or evidence, for any reason.
- Mouth pipetting is prohibited.
- Do not look down the opening of a test tube; instead, observe the contents through the sides of the test tube.
- Wave the hand gently toward the nose to waft in order to smell contents of a container.
- Open reagent bottles at arms length, angled away from the face.
- Never use chemicals or other substances from unlabeled bottles.
- Never place chemicals or reagents in unmarked containers.
- A label of a container with chemical or other solvents should not be removed or defaced.
- Ensure that reagent bottles and solvent and chemical containers have appropriate labels attached to them.
- Do not store incompatible chemicals in close proximity to each other.
- Store large volumes of flammable solvents in suitable storage areas.
- Use explosion-proof cabinets or refrigerators to store vessels of flammable solvents.
- When flammable or combustible reagents must be heated, use a steam bath, electrical mantle, or hot plate approved for the purpose. Never use an open flame.
- Do not use chipped or cracked glassware. Dispose of damaged glassware in designated waste containers.
- Do not use excessive force to remove tops, stoppers, or other items.
- Empty and rinse glassware after use.
- Do not use electrical equipment that is not properly grounded. Use only electrical equipment that conforms to the National Safety Code Requirements.
- Frayed or loose electrical cords and faulty wall plugs should not be used.

- Use electrical devices with caution in hoods. Do not use devices that may "spark" or non-explosion-proof hot plates when flammable solvents are being evaporated or when hazardous reactions may be taking place.

- Turn items off entirely by the use of an on-off switch.

Most of all, use common sense, be aware of complacency, and think of safety at all times. The above precautions are not all inclusive.

Section 8 – Ventilation

It is important for proper ventilation that hoods have a design and function compatible with the materials being used. Hoods should be located to allow incoming air to circulate within the room, and should be placed where they will not block escape routes should a fire or explosion occur.

Furthermore, in a chemical fume hood in the criminalistics learning laboratory:

- Work should be kept as far inside the hood as possible.

- When using the hood, the work surface should be kept uncluttered, ventilation slots should not be blocked, and the sash should be kept as low as possible.

- During scheduled laboratory safety inspections, the operation of the hood and the airflow should be checked to guard against airflow blockage.

- Fume hoods should be kept clean and free of unnecessary containers and equipment. Where feasible, work involving flammable gases, toxic vapors, and noxious odors should be performed in the fume hood.

Section 9 – Chemicals

A criminalistics learning laboratory must have more than one storage room or area for chemicals, glassware, equipment, and supplies. Not all items can be stored near each other. Provisions must be made for proper ventilation, adequate lighting, fire control, and emergency exit.

It is the responsibility of a lab coordinator to exercise care that incompatible chemicals are separated, flammable solvents are stored properly, and that any flammable chemical that is stored is stored in a flammable-type unit that has been purchased. Supplies must be maintained in good condition and safe practices in storage and distribution are observed.

All storage areas must be kept free of debris, and no storage area can block entrances or exits. Bulky equipment or glassware should be placed well back on shelves or installed to ensure stability and prevent inadvertent movement.

Heavy items should be stored on or as near to the floor as possible. Protective equipment should be worn as necessary.

Any chemical that is expired or has deteriorated should be withdrawn from storage and disposed of properly. A list of those chemicals must also be provided to and maintained by the lab coordinator.

Storage of chemicals in individual laboratory areas is necessary for efficient operations. Chemical storage cabinets are provided for such storage. Chemicals from stock bottles should be withdrawn from the hood and the bottles returned promptly to designated locations.

Chemical Inventory

A chemical inventory must be created and maintained, and should be the responsibility of the lab coordinator. This inventory should be kept on file and accessible to all faculty teaching criminalistics courses. The chemical inventory should show chemicals used in the laboratory including location, hazard warnings, and MSDS information. This inventory should also be provided to the college district safety officer.

Spill Control

Spills pose a significant threat to individuals present in the criminalistics learning laboratory. Caution should be taken in cleanup procedures. Those procedures listed below are for large spills, but their use can be considered for any spill. Any large scale spill must also be reported to the lab coordinator and an incident report should be completed.

For any type of chemical spill, appropriate personal protective equipment should be worn as needed.

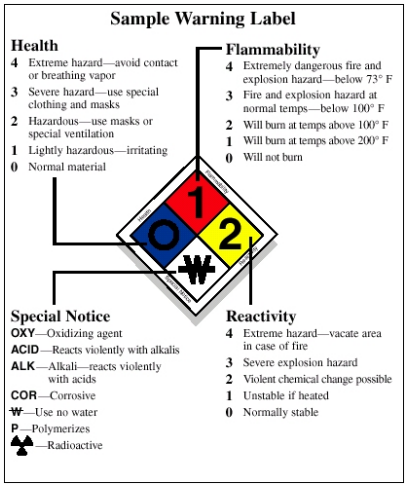
• Acid	Cover the contaminated surface with sodium bicarbonate or soda-ash and slaked lime mixture (50-50). Mix and add water if necessary to form a slurry. Scoop up slurry and wash down the drain with excess water. Wash site with soda-ash solution.
• Caustic Alkali • Ammonia	Solids should be swept up, diluted, and neutralized with HCI in a large bucket, then washed down the drain with excess water. Solutions should be neutralized and mopped up, or a water vacuum may be used. Discharge the residues to the sewer with excess water.
• Hydrocarbons • Alcohols • Ketones	Eliminate all sources of ignition and flammables.
• Liquids and Solids	Local water management control boards should be consulted in advance to determine the quantity and nature of chemicals that can be flushed into a sewage system. In the event the quantity of spill cannot be disposed of by flushing, these alternatives may be pursued: Absorb into an inert, absorbent

	material; seal in an airtight container, and dispose of by an appropriate method.

Section 10 – Hazardous Materials Labeling

Students in the criminalistics learning laboratory should be aware of potential hazards that may be encountered by chemicals, reagents, and equipment used within the criminalistics learning laboratory.

Every container of chemicals should have a label identifying its contents. Storage should be divided into two classes: (A) those containing a volume of 250mL of less, or shorter than 6 inches in height, and (B) those containing a volume greater than 250mL, or taller than 6 inches in height. Storage containers should have a label containing the National Paint and Coating Association (NPCA) codes with the respective number classification and the name of the chemical.



The label size should be 1”x2” or larger and the information should be clearly present and identifiable.

Hazardous Material Identification System (HMIS)

All storage containers used for liquid or solid storage of chemicals or other hazardous materials (reagents or solutions) should be labeled. Containers of less than 6 inches in height or capacity of less than 250mL should be labeled with a minimum information label. Containers greater than 6 inches in height or capacity greater than 250mL should use the 4”x4” label containing, in addition to the minimum information, personal protection ratings.

Labels for plastic or other dispensing bottles used for volumes of less than 250mL of a hazardous liquid should be made using embossing tape for the name of the material. Tape color should be selected on the basis of:

Acid: **Red**
Base: **Blue**

Solvents/Reagents: Yellow or **Black**

The HMIS system uses the NPCA numeric hazard identification code and uses the Occupational Safety and Health Administration (OSHA) Hazard Communication Standards for personal protection codes.

It is the responsibility of the college and lab coordinator to ensure that information about hazardous materials in the criminalistics learning laboratory are available to all interested parties. It is the responsibility of the individual to ensure they read the policies and procedures, understand them, and follow them.

Section 11 – Material Safety Data Sheets (MSDS) / Safety Data Sheets (SDS)

The Occupational Safety and Health Administration (OSHA) has developed a standardized worksheet on which can be recorded the properties and potential hazards of chemicals and other substances. The form covers the name and synonyms, chemical family, hazardous ingredients of mixtures, physical data, fire and explosion hazard data, health hazard data, reactivity data, spill or leak procedures, special protection information, and special precautions.

The criminalistics learning laboratory must maintain a file for each chemical present in the lab. These files are maintained within the criminalistics learning laboratory in an accessible and clearly marked binder, in digital formats with Dr. Matuszak and the lab coordinator (if one exists), and the college safety officer.

The MSDS, which may also be referred to as the SDS, must be maintained and updated quarterly, accompanying the lab inventory completion and safety inspections.

Section 12 – Hazardous Materials Storage & Disposal

Beyond the fundamental safeguards already mentioned are concerns specific to chemical threats. This section identifies potential hazards and additional safety procedures; these hazards may include items that are not present in the criminalistics learning laboratory, but may be at one time in the future.

Toxic Agents	Acute or chronic health hazards other than carcinogens, poisons, irritants, drugs, etc. The quantity of toxic chemicals stored should always be kept to a minimum. When inside storage of toxic chemicals is necessary, the area should be well ventilated and kept cool. Chemicals which react to produce toxic byproducts should not be stored in the same area. Flammables, acids, and water-reactive substances are examples of special storage problems.

Carcinogens	Mutagenic, tetratogenic agents that misdirect cellular growth. Any storage and use of known carcinogens should be kept to a minimum in the criminalistics learning laboratory. If any uncertainty exists on how to properly store, contact the college district's safety officer. Agents suspected of being biohazardous should be handled and stored as such. Any exposure to students should be minimal, with all proper safety procedures followed.
Corrosives	Caustic agents, acids, bases, and oxidizing agents. Acids, Bases: Mineral acids and bases should not be stored together or in the presence of other organic and inorganic chemicals. Corrosive liquids should be stored in an area which is cool but maintained above the freezing point of the chemical. This area should be dry and well-ventilated. Acids react with many metals and form hydrogen gas upon contact with aluminum. Since hydrogen forms an explosive mixture with air, accumulation of hydrogen in storage areas should be prevented. Oxidizing: The storage area for oxidizing agents should be fire-resistant, including shelving, cool, and ventilated to the outside. The feloor of the storage room should be fire resistant, watertight, and without cracks where materials can lodge.

Proper storage is also the responsibility of the college to ensure maximum protection for students and faculty, as well as to avoid any potential hazardous environments or injuries. The different categories within the criminalistics learning laboratory for storage will fall across: explosives, flammables, organics and inorganics.

Explosives	Solids, liquids, and vapors that will violently and rapidly release energy. Storage facilities for explosive chemicals should be well identified and isolated from other areas. The type of storage area required will depend upon the particular chemical and the quantity stored. If standards of explosives are kept in the laboratory, the minimum quantity necessary should be stored.
Flammables	Ease of ignition or oxidation. Flammable liquids in quantities greater than one liter should be stored in metal safety cans after being opened. Where inside storage of a large quantity of flammables should not be necessary within the criminalistics learning laboratory, best practices mandate that if it were, an automatic fire-suppression halon system would be strongly recommended. Combustible material should not be stored or stacked so as to be no higher than 24 inches from the ceiling.

	The volume of flammable accelerant liquids retained as evidence should be stored in metal containers. When possible, glass containers should not be used. The volume of flammable liquids should be kept to a minimum, and containers of flammable liquid should not be stacked.
Organics & Inorganics	Store organic chemicals separately from inorganic chemicals.

Chemical Waste – Analytical Procedures

A suitably labeled container should be made available at all work areas for disposal of organic waste. Only chloroform, petroleum ether, methylene chloride waste, and organic solvents contained in glass vials will be disposed of in these containers. The disposal of these containers must comply with the State and Federal laws concerning a small quantity generator.

The container should be a resealable small-mouthed bottle or other suitable container (i.e. four liter reagent bottle). Approximately 200 mL of water should be maintained in the container to minimize vapor collection. The container should be labeled “Chloroform Waste” or “Organic Waste.”

Chemical Waste – Chromium Wastes

All solutions known to contain chromium should be disposed of in an approved manner. These solutions include, but are not limited to alcohol reagents and chromic acid cleaning solutions. These solutions should not be washed down the drain until they have been reduced to Cr (III) and the pH has been increased to about 5.0., (see methods described below), Until such time that these solutions can be properly treated and disposed of, they should be maintained and stored.

A storage container for the chromium wastes should be maintained. This container should be labeled “Chromic Acid” or “Chromium Waste,” and “Corrosive.” All chromium waste should be stored in this container until enough has accumulated for treatment and disposal.

Treatment should be done using one of the following two methods:

- Reduce the pH of the solution to less than 3.0 using sulfuric acid. At room temperature, stir in sodium sulfite. Monitor the temperature of the solution. An increase in temperature indicates the reaction has begun. If the reaction does not begin, lower the pH with additional sulfuric acid until the reaction starts. A color change to green will indicate that the reaction is complete. Carefully add dilute sodium hydroxide or sodium carbonate to increase the pH to about 5.0.
- Treat the solution with methanol or ethanol until a color change to green occurs. Increase the pH of the solution to about 5.0 by the addition of dilute sodium hydroxide or sodium carbonate.
- Both methods will reduce Cr (VI) to Cr (III). Before the disposal of the waste, the solution should be green in color. This green indicates the reduction of the chromium is complete.

Note: Once the solution has been treated, and the reduction of the chromium is complete, it is permissible to flush the solution down the drain with copious amounts of water. If the solution is to be picked up as a hazardous waste, a concentration step may be necessary to decrease the total volume of the solution.

Section 13 – Instrument & Equipment Hazards

It is essential to the operation of the criminalistics learning laboratory that the following fundamental safety guidelines are established and maintained:

- Individuals should only be allowed to use equipment after the lab coordinator/instructor has determined the student is familiar with the equipment, its operation, safety features, and inherent hazards.
- No alteration of manufacturer safety features will be allowed.
- All electrical units should be grounded and double insulated.
- All maintenance should be performed by trained and qualified personnel.

General Purpose Laboratory Equipment

In addition to safety recommendations in other sections, the following devices warrant special consideration: hot plates, heating mantles, water baths, shakers, centrifuges, rheostats, electronic thermometers, balances, and refrigerators.

Tools and Repairs

Emphasis should be placed upon proper hand and eye protection when working with tools. Proper training and use of the equipment must be received and adhered to by the user.

Equipment

- Serial number chemical restorations should be conducted only where hood-type ventilation exists.
- Inspections will be held periodically to ensure that machines are properly grounded and circuits are not overloaded.
- Adequate outlets should exist. No extension cord should be used across the floor of the room in lieu of a proper outlet.

Glassware and Sharps Hazards

Probably more accidents occur in the laboratory from the handling of glassware than from any other cause. Therefore, it is essential that proper measures be taken in handling glassware.

- Intelligent selection and use of glass equipment can prevent breakage and injury from broken glass and from the materials no longer contained in these damaged containers. The use of shields can prevent serious consequences from glassware rupture during chemical reactions. Safety goggles can prevent eye injuries from flying glass.
- Glassware storage areas should be well lit. Heavier pieces of glassware should be stored on lower shelves, preferably no higher than an individual can easily reach without the use of a ladder or step stool. Delicate pieces of glassware should be stored in clearly marked containers.
- Glassware should always be properly handled. Glassware should never be carried by projections, such as the sidearm of a distilling flask. Beakers full of liquids must never be carried by their rims. Shaking one liter or larger volumetric flasks by the neck should be avoided, since this invites breakage. Chipped, cracked, badly stained, etched, or poorly annealed glassware should be discarded.
- Heavy glass apparatus should be supported with rigid, padded clamps. Use of more clamps than necessary to support assemblies may also cause safety problems.
- Glass items to be disposed of will be placed in the glass disposal containers located throughout the laboratory sections. Glass items will not be discarded in normal trash containers.
- Sharp metal objects such as needles or scalpel blades will be discarded in specialized containers. These containers will be discarded in biohazard containers. Never discard these items in the normal trash container.
- Glass or metal objects containing any biological hazardous material will be discarded in the proper container.

Section 14 – First Aid

It is a benefit to ensure criminalistics learning laboratory personnel, including faculty and coordinators, have received formal first aid training from an agency like the American Red Cross.

Injuries

Burns:

The first thing to learn about burns is that, for the most part, they are preventable. Time spent in eliminating hazardous conditions is well worth the effort.

There are three major causes for burns in the laboratory: Heat or thermal, chemical, and electrical. Burns are grouped in order of their severity: (1) first degree burns show reddening of the skin, but no damage to the deeper layers; (2) second degree burns involve blistering of the skin; and (3) third degree burns, involved skin that is burned off or severely damaged. The seriousness of a burn is determined not only by the degree but also the extent of the burn area.

Burns are probably the most painful of all injuries. Pain is most severe at the time of the burn and shortly thereafter. Shock may occur if the burn is extensive.

Thermal Burns:

If the burn is relatively minor, the burned area should be immersed in cold water, ice water if available, as quickly as possible. The cold-water treatment should be continued until the pain is relieved and does not return when the burned area is removed from the water. Prompt application of cold tends to ease pain and tends to reduce the severity of the burn.

When the wound has dried, it should be bandaged with a sterile gauze bandage. If there is more than superficial blistering, with consequent risk of infection, the burn should be seen by a physician. In the meantime, the blisters should not be disturbed. The individual should decide on the necessity for professional medical consultation.

For serious thermal burns, arrangements for medical attention and evacuation will be immediately made.

Chemical Burns:

Chemical burns should be treated by immediately flushing off the chemical with copious amounts of water. The flushing should be continued until the entire chemical has been washed away and the pain is reduced or eliminated. If the burn was caused by concentrated acid, a solution of sodium bicarbonate should be poured over the burn after the initial washing with water. Treatment is then similar to that for thermal burns.

If clothing has been contaminated, the clothing should be removed or cut away as quickly as possible. If an emergency shower is available, it should be used, and the contaminated clothing removed while the individual is under the shower. No neutralizing or buffering agents should be used. If the burn is severe, medical attention should be obtained by calling 9-1-1.

Chemical burns of the eye are particularly dangerous, and immediate action must be taken to prevent serious damage to vision. The eye should be flushed immediately with copious amounts of cold water. The eyelid should be held open, forcibly if necessary, so that the entire surface of the eye is flushed.

Since promptness is of great importance, the injured individual should be taken to the nearest emergency eye wash station. A low-pressure stream of water from a cold-water faucet should be used if available or the individual should lie down and have water gently poured into the inner corner of the eye so that the water will flow across the eye and out the outer edge. The treatment should continue for at least 15 minutes. The injured individual should be seen promptly by a physician, preferably an ophthalmologist.

Electric Shock:

Electric shock is the injury produced by the passage of an electric current through the body. It can be caused by any number of situations such as frayed electric cords, improperly grounded receptacles, short-circuited equipment, or simultaneous contact with a source of current and a water faucet (or when standing on a wet surface).

Moderate electric shock can produce a dazed condition or mental confusion and/or surface burn or deep burn. Severe shock can produce unconsciousness and death.

The injured person must be removed from contact with the source of current or the current must be turned off immediately. In order to free the victim from contact with the source of current, he/she should be pushed with a dry board, a broom handle, or a large roll of dry newspapers, or pulled with a dry rope or dry clothing looped over a foot or hand. Send for medical aid immediately by calling 9-1-1.

Foreign Bodies in the Eye:

A foreign body may lodge on the inner surface of either the upper or lower eyelid or on the eyeball itself. Bringing the upper eyelid down over the lower and holding it there for a moment may cause tears to flow, often washing out the foreign body. If the loose object is found under or on the lid, it can usually be removed safely with the corner of a clean handkerchief or with a wet piece of sterile cotton or a Q-tip. If the particle is attached or embedded in the eyeball, no attempt should be made to remove it. Professional emergency treatment should be sought.

Bleeding:

For small wounds, cleanse with soap and warm water. To stop bleeding, apply steady pressure directly over the wound with a sterile pad or compress. If bleeding is more than superficial and a gauze pad is not immediately available, any clean cloth may be used. The pad should not be removed to see if the bleeding has stopped. If blood saturates the pad, apply more layers and maintain the pressure. If a limb is involved, elevating the injured limb will help to reduce the flow of blood.

The need for further medical attention or assistance will be determined and immediately obtained if necessary.

Poisoning by Inhalation:

Remove the victim from exposure and get him/her to fresh air as quickly as possible by carrying or dragging. If exposure has been severe or the person is unconscious, call 9-1-1 at once; keep the person warm and lying down.

First Aid Kits

There are multiple first aid kits available within the criminalistics learning laboratory, both locked in cabinets and easily accessible within the classroom. A first aid kit can also be located in metal storage cabinet #2 (the center cabinet), on the second or third shelf.

There are no AEDs present in the classroom or in any known location on the basement floor of the quadrangle building.

Medical Emergencies

According to the American College of Emergency Physicians and other national organizations, the following are some of the warning signs of a medical emergency. In a medical emergency call 911.

- Difficulty breathing; shortness of breath
- Chest or upper abdominal pain or pressure
- Fainting or loss of consciousness
- Unresponsiveness when talked to or touched
- Drowning
- Unexplained seizures or convulsions
- Sudden dizziness, weakness, or change in vision
- Mental change (confusion, unusual behavior, difficulty walking or speaking)
- Unexplained severe headaches
- Sudden or intense pain
- Bleeding
- Coughing up or vomiting blood
- Suicidal or homicidal feelings
- Choking
- Severe burns
- Allergic reactions
- Trauma (Injury)
- Hypothermia or abnormally low body temperature
- Hyperthermia or abnormally high body temperature
- Heat stress or exhaustion
- Motor vehicle accident injury
- Industrial accident
- Drug overdose or poisoning
- Neck or back injury

Reporting Incidents

All incidents that occur within the criminalistics learning laboratory must be reported as soon as is safe and possible. The instructor has the responsibility to complete an incident report, which can be found online at Dr. Matuszak's website, under Criminalistics Lab tab, titled "Incident Reports." Incident reports, once completed, will be submitted to:

- 1 copy is turned into the college district safety office.
- 1 copy is stored in Dr. Matuszak's office.
- 1 copy is given to the student/individual involved in the incident.

If an incident involves multiple parties, an incident report must be completed for each party, with 3 copies made for each report. These reports must be completed in an expedited manner.

Section 15 – Fire Safety

Individuals within the criminalistics learning laboratory must be made aware of the fire extinguisher, against the south wall, within the classroom. There is no visible fire alarm in the classroom, as the criminalistics learning laboratory is operated by the same fire safety equipment as the rest of the quad.

Students and instructors within the criminalistics learning laboratory should be aware of fire evacuation routes, which are posted on the north wall.

If a fire alarm were to sound alarms and flash lights during a laboratory work environment in the classroom, students should immediately remove any and all personal protective equipment, turn off any equipment being used, and follow proper evacuation procedure to leave the lab.

Emergency Evacuation Procedures

The two main reasons for emergency evacuation of a facility are fire and bomb threats. Both are serious situations that cannot be treated lightly. Planning and preparation are necessary to assure that response is timely, appropriate, and eliminates any possibility of injury to students and faculty.

Fires

When a fire occurs, it is important to try to keep it small and to localize it to the area of origin until it can be brought under control. Equally important is the need to alert all students and faculty of the fire so that they can be safely evacuated if the fire cannot be controlled. The first person who discovers the fire should give the alarm.

If it appears that the fire may be serious, and time permits, every effort should be directed toward confinement to limit the extent of damage and allow more time for evacuation. Methods of confinement include closing doors, pulling down the sash on the fume hood and turning off the power,

turning off gas cylinders and systems, closing windows, turning off flames, hot plates etc. The fire department will be notified as soon as a fire, that cannot be contained, is discovered. The alarm will not be delayed awaiting the results of attempts to extinguish the fire. A fire that has gained headway before the fire department is called is often quite difficult to extinguish. The fire department personnel will make sure the fire does not rekindle itself and determine when the building is safe to re-enter. Emergency medical personnel will also be present to treat any injuries.

Bomb Threats & Threats of Violence

Bomb threats and threats of violence can be real or they can be a form of harassment. A threat will be treated seriously and steps taken to protect students, faculty, and property. Any threat received will be reported immediately to the Riverside City College Police Department (#951-222-8171).

Fire Extinguishers

In spite of education, precautions, and planning, fires do occur in laboratories for a variety of reasons. This section details fire containment through the use of portable fire extinguishers. This equipment is available in the criminalistics learning lab.

Fire extinguishers are an important part of any overall fire protection program. There are however, a number of conditions which should be met in order to ensure their effectiveness:

- The extinguishers are properly located and in working order.
- The extinguishers are the proper type for a fire which may occur.
- The extinguishers are deployed while a fire is small enough for the extinguisher to be effective.
- The fire is discovered or reported to a person who is ready, willing, and able to use the fire extinguisher.

The Riverside Fire Department (911) should be notified as soon as the fire is discovered. The activation of the fire alarm should not be delayed awaiting the results of application of portable fire extinguishers. There are a number of general requirements for locating and placing extinguishers:

- Portable extinguishers should be maintained in a fully charged and operable condition and kept in their designated places at all times when they are not being used.
- Extinguishers should be conspicuously located where they will be readily accessible in the event of fire. They should be located along normal paths of travel.
- Extinguishers should not be obstructed or obscured from view. A sign will identify each extinguisher at its location.

Fires are classified as Class A, B, C, and D. Portable fire extinguishers are classified for use on certain classes of fires and rated for relative extinguishing effectiveness by recognized testing laboratories. A student or faculty member should not use an extinguisher if unaware of type and proper technique.

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Types of Fires and Extinguishers:

Class A	Fires in ordinary combustible materials, such as wood, cloth, paper, rubber, and many plastics. The quenching and cooling effects of water are used to fight such fires. Extinguishers effective against such fires consist of all types, but pressurized water is the most common. The 2-1/2 gallon size weighs about 30 pounds and has a solid stream range of 35-40 feet. Under continuous use, it has a discharge time of about 55 seconds. Extinguishers suitable for Class A fires are generally identified by a triangle containing the letter "A." If colored, the triangle is green.
Class B	Fires involving flammable liquids, flammable gases, tars, greases, oils, oil base paints, and lacquers. For this type of fire, a blanketing or smothering effect is essential in order to remove the oxygen and put out the fire. Extinguishers effective against such fires are: Carbon Dioxide – The carbon dioxide is discharged in the form of a gas/snow cloud and has a relatively short range of 3-8 feet. The principle advantage of carbon dioxide is that it does not leave a residue after use. Minimum discharge time varies from 8-30 seconds, depending on size. Liquid Gas Extinguishers – (such as Bromochlorodifluromethane/Halon 1211) These units have features and characteristics similar to carbon dioxide extinguishers in that they are noncorrosive and they do not leave residues. Halon 1211 extinguishers weigh considerably less than carbon dioxide extinguishers. Care must be exercised in their use since their decomposition products can be hazardous. If used in a confined area, avoid breathing the gases or thermal decomposition produced by Halon 1211. Extinguishers suitable for Class B fires are generally identified by a square containing the letter "B." If colored, the square is red.
Class C	Fires which involve energized electrical equipment and require an electrically nonconductive extinguishing device. Extinguishers of the carbon dioxide or Halon 1211 type are ideal. They present no shock hazards and leave no harmful residues to damage instruments. Dry chemical extinguishers are effective, but leave residues which may cause further damage to instruments. Halon 1211 is recommended for use near computer equipment since the-1100F temperature associated with carbon dioxide discharge can damage computer components.

	Extinguishers suitable for Class C fires are generally identified by a circle containing the Letter "C." If colored, the circle is blue.
Class D	Fires which involve combustible metals, such as magnesium, titanium, sodium, lithium, and potassium. These metals are violently reactive with water. Extinguishing agents of the Class D type are generally available in the form of powders. The powders are discharged by pressure and they must be spread evenly over the surface of a fire to a depth sufficient to smother the fire. The two most common agents are G-1 powder and Met L-X powder. Extinguishers suitable for fires involving metals are generally identified by a five-pointed star containing the letter "D." If colored, the star is yellow.

Section 16 – Laboratory Inventory & Ordering

The position of a lab coordinator would be beneficial to ensure this responsibility is handled appropriately and in a timely manner. An inventory for the criminalistics learning laboratory should be completed quarterly, and consist of all materials, equipment, substances, and items within the laboratory and any secondary/sister sites, including any and all supplies in the forensics yard/grave excavation area at Ben Clark Training Center.

It is the responsibility of the instructor of a criminalistics class to ensure that any materials or supplies that need to be reordered or are close to being empty be brought to the attention of the lab coordinator (if position exists) or Dr. Matuszak as soon as possible to ensure the product is reordered quickly. This must occur in a timely manner to avoid students not having access to equipment to meet the required student learning outcomes because the item is out of stock and was not reordered in time.

Section 17 – Laboratory Access Control

The criminalistics learning laboratory is primarily located within QD16 within the quad; there are two points of entry into the room, both of which are lockable and require a college-issued key for access. Within the lab, there are multiple storage cabinets that are also secured and require keys for access.

For inventory control and safety, only faculty members that teach criminalistics courses should be issued keys to the criminalistics learning laboratory. A list of all personnel with assigned keys should be kept by the lab coordinator and also provided to the department IDS. Any personnel who no longer teach criminalistics courses must be required to turn in their issued keys within 2 weeks after their formal notification that they will no longer teach criminalistics courses.

The criminalistics learning laboratory has been designated by the college for the purposes of criminalistics courses, and dedicated to the memory of Mike Joyce, for this singular purpose. Any course not related to the Administration of Justice program taught in QD16 will have no need, and therefore no access, to any of the equipment (secured or unsecured) within the learning laboratory.

Section 18 – Equipment Loaning Procedures

The criminalistics learning laboratory supports student success and continually looks for opportunities to add to its resources in order to allow students to have access to up-to-date technical equipment to build marketable skills. However, as the program continues to transition, there are still items that were dedicated by Dr. Matuszak into the inventory for use until the college contributed financial funds to bring the learning laboratory into compliance. Also, because of the potential hazards many of the supplies may present to safety, as well as security concerns, equipment and supplies within the laboratory should not be loaned to students for use outside the classroom.

If other faculty/staff within the district would request access to or use of equipment within the criminalistics learning laboratory, that decision should be made by the lab coordinator in conjunction with the criminalistics faculty, and then the Equipment Loan form should be completed, it its entirety, prior to the loan.

The information within the form includes the responsibilities of the individual being loaned the equipment, including potential replacement costs, and guidelines for the equipment's usage. No equipment should be loaned out by the criminalistics lab to an individual unless there is also an establishment that the individual has prior training or knowledge or is made aware of proper handling procedures and techniques for any substances or equipment loaned.

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