Eastern Kentucky University

College of Arts and Sciences

Chemical Hygiene Plan

2006 - 2007

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I. Purpose

The purpose of this Chemical Hygiene Plan (CHP) is to describe work practices and procedures to help ensure that laboratory workers in the College of Arts and Sciences at Eastern Kentucky University are protected from health and safety hazards associated with the hazardous chemicals they work with. The Chemical Hygiene Plan is required by the U.S. Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.1450, entitled "Occupational Exposures to Hazardous Chemicals in Laboratories," often referred to as the Lab Standard. The full text of the Lab Standard can be viewed at the OSHA web site (1). General information about OSHA Hazard Communication programs also can be found at the OSHA web site (2).

II. Definitions

The following definitions are taken from the Lab Standard. Other definitions are available from that document.

Chemical Hygiene Plan: a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (ii) meet the requirements of paragraph (e) (of the Lab Standard).

Employee: an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

Hazardous chemical: a chemical for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principals, that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Laboratory: a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Laboratory scale: work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safety manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

III. Applicability and Assistance

The Lab Standard applies to all employers engaged in the laboratory use of hazardous chemicals. This Chemical Hygiene Plan applies to all employees in the Eastern Kentucky University College of Arts and Sciences. This includes the Departments of Art, Biological Sciences, Chemistry, Earth Sciences, and Physics, and the Environmental Research Institute. Although students are not technically employees of the university, this plan specifies that all students involved in laboratory activities must adhere to the requirements of the CHP.

If there are questions about this document, contact the Chemical Safety Officer (see Appendix 1 for a personnel listing).

IV. Responsibilities

The College of Arts and Sciences at Eastern Kentucky University is committed to providing a safe and healthful environment for all persons associated with the college. All administrators, faculty, staff, and students are expected to support these goals.

A. **The Dean of the College of Arts and Sciences** has the ultimate responsibility for implementation of the College Chemical Hygiene Plan. The Dean (or his designate) shall

1. Identify those departments within the College to which the Lab Standard applies;
2. Appoint a College Chemical Safety Officer;
3. Approve and support the Chemical Hygiene Plan;
4. Make budget arrangements for health and safety improvements.

B. **Department Chairs** have primary responsibility for implementation of the CHP within their departments. The department chairs shall

1. Appoint a departmental representative to the Chemical Safety Committee;
2. Work with faculty and staff to adapt the Chemical Hygiene Plan to include department- or lab-specific guidelines;
3. Ensure that each laboratory has a specific person designated as the "laboratory supervisor" for the laboratory. This is especially important for labs that have many users, such as teaching labs.
4. Make budget requests for health and safety improvements;
5. Support the safety program;
6. Ensure that faculty and staff adhere to the CHP and to accepted safety practices;
7. Maintain a current copy of the CHP in the departmental offices.

C. **The College Chemical Safety Officer** (CSO) shall

1. Ensure that the College Chemical Hygiene Plan is reviewed annually and modified as needed;
2. Chair the College Safety Committee;
3. Maintain documentation relating to the College CHP, including training records, internal inspection records, and copies of meeting minutes and memos;
4. Inform and train laboratory faculty, staff, and student workers about chemical safety as required by the College CHP;
5. Conduct annual internal inspections of labs for health and safety and submit written reports of the inspection to the Department Chair.

D. **The Safety Committee of the College of Arts and Sciences** shall consist of the Chemical Safety Officer, the Chemical Storage Facility manager, and at least one representative from each department covered by the CHP. The representatives are appointed by the Department Chair. The committee shall

1. Assist the CSO with annual review of the College CHP;
2. Provide technical advice to laboratory supervisors and workers concerning requirements of the College CHP;
3. Make recommendations to the department chairs and dean for safety improvements;
4. Serve as a liaison between safety personnel and the departments to improve communication.
5. Assist the CSO with annual safety evaluations of all the department laboratories.

E. The Chemical Storage Facility Manager shall

1. Provide access to MSDS sheets upon request;
2. Maintain the chemical inventory for the Chemical Storage Facility and records of distribution of chemicals to the laboratories;
3. Produce and distribute guidelines and information about waste management to faculty and staff;
4. Maintain the Waste / Used / Excess Chemical area until periodic waste pickup by the University Safety and Health Office;
5. Assist faculty with issues relating to chemical storage, handling, disposal, labeling, and safety;
6. Assist the College CSO with training and informing laboratory faculty, staff, and student workers about safety issues;
7. Assist the CSO in conducting annual internal inspections of labs for health and safety.

F. Faculty and staff (including teaching and research assistants) in charge of supervising laboratories (referred to as laboratory supervisors throughout this document) shall

1. Comply with all the requirements of this Plan and follow accepted safety practices;
2. Ensure that all of their laboratory workers receive training on the CHP and any other special hazards encountered in a specific laboratory;
3. Ensure that all of their laboratory workers comply with this Plan and follow accepted safety practices;
4. Identify hazards unique to their individual laboratories, develop written procedures to address safety issues pertinent to these special hazards, and add these to the College CHP;
5. Know what chemicals are stored and used in their laboratories and the hazards associated with them;
6. Maintain a current inventory of chemicals present in the laboratory;
7. Provide access to MSDS sheets;
8. Ensure that safety equipment and supplies are present and functional and that laboratory workers use this equipment as needed;
9. Request funds needed for specific health and safety improvements;
10. Report significant accidents or incidents to the department chair;
11. Ensure that the information on laboratory identification signs is current;
12. Correct any safety deficiencies identified during inspections.

G. Laboratory workers shall

1. Comply with all health and safety standards and rules;
2. Report all hazardous conditions to the laboratory supervisor;
3. Wear or use prescribed protective equipment;
4. Report any suspected job-related injuries or illnesses to the laboratory supervisor and seek treatment immediately;

5. Refrain from the operation of any equipment or instrumentation without proper instruction and authorization;
6. Remain aware of the hazards of the chemicals in the lab and handle hazardous chemicals safely;
7. Request information and training when unsure how to handle a hazardous chemical or procedure.

Appendix 1 provides a list of current administrative personnel.

V. Standard Operating Procedures

The Lab Standard requires that operating procedures relevant to safety and health considerations be developed by the employer and followed by the employee for laboratory work involving the use of hazardous materials.

This Plan includes a minimum set of procedures for laboratory operations and for handling hazardous chemicals in laboratories at Eastern Kentucky University. Individual laboratories or research groups are required to develop more detailed procedures as their situations warrant. These procedures must be written, added to the College Chemical Hygiene Plan, and made available to laboratory workers. Acceptable lab safety references such as those listed in the OSHA Lab Standard may be adopted in whole or may be useful in developing additional procedures. ***In all situations, individual faculty or staff will be responsible for enforcing adequate safety and hygiene measures in laboratories they supervise***. If necessary, additional assistance from the College Chemical Safety Committee is available. The following standard operating procedures apply to all labs in the College.

A. General Laboratory Operations and Conduct

1. All laboratory employees, students, and visitors in laboratories must wear appropriate safety glasses, goggles, or face shields at all times where hazardous chemicals are stored or handled. Safety glasses with side shields or goggles are required when chemical splashes are possible.

   Both OSHA and the American Chemical Society have revised their guidelines on contact lenses. Contacts may be worn in the laboratory, but they should not be considered eye protection devices. Safety glasses or splash goggles shall be worn over the lenses (3).
2. All laboratory employees, students, and visitors must wear or use additional personal protective equipment (PPE) as appropriate and needed. Appendices 2 and 2a provides guidelines for the appropriate PPE for various operations, and references 4 and 5 provide links to web sites with PPE information.
3. Eating, drinking, smoking and the application of cosmetics are prohibited in areas where hazardous chemicals are used.
4. Horseplay, practical jokes or other inappropriate and unprofessional behavior in the laboratory setting is forbidden. Avoid distracting or startling any other workers.
5. Food intended for human consumption must not be stored in the same refrigerator with chemicals, biohazards or radioactive materials.
6. The laboratory supervisor must control access to laboratories.
7. Hands should be washed frequently throughout the day, before leaving the lab, after contact with any hazardous material, and before eating.
8. Loose hair and clothing must be confined. Shoes are to be worn at all times in the laboratory. Closed toe shoes must be worn in laboratories where hazardous materials will be handled.
9. Materials should never be pipetted by mouth.

10. When working with acutely hazardous materials, it is advisable to have a second person present. At a minimum, another person should be aware of the location and expected work time of the person handling the acutely hazardous materials.

11. For laboratory operations carried out continuously or overnight, it is essential to plan for interruptions in utility services such as electricity, water and gas. Plans must be made to avoid hazards in case of failure. If necessary, arrangements for routine inspection of the operation are to be made and, in all cases, the laboratory lights should be left on and an appropriate sign posted on the door. The identity of the materials being used, hazard labels, correct action to take in case of emergency, and the phone number of a contact person should be included.

12. Laboratory areas shall be kept clean and uncluttered. This will help prevent spills, breakage, injuries, unnecessary contact with chemicals, and accidents.

13. Spills are to be cleaned up immediately according to the guidelines in Section XI C of this CHP.

14. Access to exits, aisles and safety equipment shall not be obstructed in any way with equipment, furniture, supplies, etc.

15. Proper equipment that is in good operating condition should be used for all laboratory operations. Check the integrity of containers. If they are found to be damaged or leaking, transfer to an acceptable container or call the Chemical Storage Facility Manger for assistance.

16. Lab workers are not allowed to remove chemicals from the lab for personal use.

17. Pregnant workers or students should inform the laboratory supervisor of their pregnancy. The laboratory supervisor can provide the pregnant woman with information about the hazardous materials that will be encountered during the course of the laboratory work. The decision about whether or not to continue to work in the lab or remain in a laboratory teaching course is made by the student and her physician.

18. No one shall work in the laboratory while under the influence of alcohol or drugs.

B. Hazardous Material Storage

1. Chemicals should be stored by compatibility, not simply by alphabetical arrangement. Oxidizers should be separated from organics, air/water reactives must be kept dry and cyanides should be stored away from acids. See Appendix 3 for examples of common incompatible chemicals. More information on chemical compatibility can be found in reference 6.

2. Hoods are not to be used for long-term storage of chemicals.

3. Volatile toxic substances must be stored in cabinets designed for this purpose. When volatiles must be stored in a cooled atmosphere, flammable refrigerators or similar specially designed equipment must be used.

4. Laboratory refrigerators used for storing or cooling flammable liquids will be in compliance with NFPA 45 - Fire Protection for Laboratories Using Chemicals, section 9.2.2.2 and A.9.2.2.2. Self-defrosting refrigerators, either modified or unmodified, will not be used for storing or cooling flammable liquids. General-purpose refrigerators are not to be used for the storage of flammable or reactive liquids or solids. They shall be labeled "Not for Storage of Flammable or Reactive Liquids or Solids." Refrigerators used for storage of chemicals must not be used to store food, beverages or cosmetics. They shall be labeled "Not for Storage of Food, Beverages or Cosmetics."

6. Pressurized gas cylinders must be stored in well-ventilated areas with their protective caps screwed on and the cylinder secured (e.g., strapped or chained in an upright position) to reduce the chance of the cylinder being knocked over. Do not store cylinders near heat or high traffic areas. Do not store flammables and oxidizers together. Do not store empty and full cylinders

together. Storage of large quantities of cylinders must be done in an approved gas cylinder storage area. Gas cylinders must be moved using appropriate handcarts. Extremely toxic gases (e.g. hydrogen sulfide, chlorine, arsine) should not be moved through regular exit corridors, particularly during business hours. Always consider cylinders as full and handle them with corresponding care.

7. Substances with an NFPA flammability rating of 3 or 4 must be stored in approved flammables cabinets. No more than 500 mL (total) of flammable material should be on the benchtop at any given time.

C. Hazardous Material Handling

1. Extremely hazardous materials should not be used on open laboratory benches.

2. The use of plastic-coated bottles or bottle carriers for transporting chemicals which are in regular glass containers is encouraged. Caps should be closed securely. Chemical containers should not be stored in hard-to-reach areas.

3. Chemicals should be transferred from one container to another with care.

4. Always add concentrated acid to water. Never add water to concentrated acid.

5. Containers that hold more than five gallons of a flammable material must be grounded when transferring the liquid.

6. Perchloric acid should not be used in the College of Arts and Sciences at Eastern Kentucky University, because there are no fume hoods designed for perchloric acid use.
   When perchloric acid is heated above ambient temperature, vapors may condense within the exhaust system to form explosive perchlorates. In such instances, specially designed fume hood exhaust systems must be utilized. These systems will have dedicated exhausts and a water washdown system, and may be used for perchloric acid digestions only.

D. Hazardous Material Disposal – General Guidelines

1. A guide to materials that may be disposed of in laboratory drains is found in the College of Arts and Sciences *Guide to Chemical Ordering, Tracking, and Disposal* (in draft form as of July 2006; not yet available)***. No water-insoluble materials should be disposed of in laboratory drains***.
2. All waste must be placed into appropriate containers and labeled clearly with the identity of the waste(s), the approximate amount of each material, the dates wastes were added to the container, and the name of the person who added the waste. Each container must be clearly marked with the words
3. Waste must be segregated by type. Mixing of waste material must be avoided because this complicates disposal. Contact the Chemical Storage Facility Manager for information **before** creating waste.
4. Avoid mixing chlorinated solvents with non-chlorinated solvents in waste containers.
5. All sharp objects, needles and glass must be disposed of in an approved labeled container. Glass objects and other potentially sharp objects shall not be disposed of in common office refuse. Containers must not be overfilled and must be labeled and sealed for proper handling and disposal.
6. Biohazardous waste must be placed into a container that is marked for such waste.
7. All waste containers that are rejected by the University Safety and Health office for pickup will be returned to the responsible faculty member. ***Departments will be responsible for the cost of characterization and disposal of unmarked hazardous waste.***

E. Labels And Signs

1. All containers must be labeled. All labels must be legible and in English. The label should include the chemical/product name, date prepared, received, or opened, name of the user, and hazard information. The NFPA label is used to provide this information in the College of Arts and Sciences. See Appendix 4 for an explanation of the NFPA label. Contact the CSO or Chemical Storage Facility Manager for additional information.
2. Labels on incoming containers must not be removed or defaced.
3. All substances which can form explosive peroxides and other chemicals which may become unstable over time (e.g. picric acid, ethers) must be dated when received and opened. These materials should be used promptly and disposed of appropriately. Contact the Chemical Storage Facility Manager for assistance.
4. Each laboratory door must be legibly marked with the following information: room number, department, laboratory supervisor's name, emergency contacts, including names, office location, and office and emergency telephone numbers, special hazards/instructions (e.g. location of large quantities of flammables or the presence of a "local alarm" system). An example of a laboratory sign is provided in Appendix 5.

F. Safety Showers And Eye Wash Stations

1. Safety showers and eye wash stations shall be available in or near all laboratories where hazardous materials are in use.
2. Eyewashes should be tested at least weekly by the person in charge of the lab section or the person who will be working in the lab. The eyewash should be flushed for several minutes at least once a month to prevent buildup of materials or organisms that could damage the eye if the eyewash were used for an emergency.
3. Safety showers are tested periodically by department laboratory mangers. Tags will be fastened to the showers, and testing will be noted on the tag,

G. Fume Hoods And Other Engineering Controls

1. All fume hoods at Eastern Kentucky University facilities should have face velocities between 80 and 150 fpm with the sash at a "working height" (approximately 14 inches). As a general rule, fume hoods should not be operated with the sash fully open and should have the sash closed when not being used. The University Safety and Health office conducts a fume hood inspection and certification program for all fume hoods at the university. The CSO should be provided with a copy of the hood inspection results.
2. Fume hoods with face velocities below 80 feet per minute must be marked with a sign indicating that the hood may not be used for chemical manipulations. A work order to repair these hoods should be processed as soon as possible.
3. When using a fume hood, one must remember that the hood does not provide absolute containment or absolute protection from the materials in the hood. However, for most exposures, a properly designed hood in a properly designed room can provide adequate protection if basic work practices are followed.

- All operations which may generate air contaminants at levels above the exposure limit must be conducted inside a hood.

- Keep all apparatus at least 6 inches back from the face of the hood. A stripe on the bench surface is a good reminder.

- Do not put your head in the hood when contaminants are being generated.

- Do not use the hood as a waste disposal mechanism.

- Excessive storage of chemicals or any apparatus in the hood will impair the performance of the chemical fume hood. Store flammable chemicals in an approved flammable storage safety cabinet. Store corrosive chemicals in a corrosive storage cabinet.

- Be sure that the switch is in the "on" position whenever the hood is in use and test hood often for airflow. Airflow can be visually monitored by attaching a lightweight ribbon to the bottom of the sash.

- Keep the slots in the hood baffle free of obstruction by apparatus or containers.

- Minimize foot traffic past the face of the hood.

- Do not remove hood sash or panels except when necessary for apparatus set-up; replace sash or panels before operating.

- Do not place electrical receptacles or other spark sources inside the hood when flammable liquids or gases are present. No permanent electrical receptacles are permitted in the hood.

- Use an appropriate barricade if there is a chance of explosion or eruption.

- If the hood sash is supposed to be partially closed for operation, the hood should be so labeled and the appropriate closure point clearly indicated.

- All fume hoods should have spill protection lips (at the front of hood and for cup sinks located in the hood).

VI. Controlling Chemical Exposures

The Lab Standard requires the employer to determine and implement control measures to reduce employee exposure to hazardous chemicals. Particular attention must be given to the control measures for chemicals that are known to be extremely hazardous. There are three major routes of entry for a chemical to enter the body: inhalation, absorption, and ingestion. The controls for prevention of these various routes of entry include engineering controls, personal protective equipment and administrative controls.

A. Inhalation

Inhalation of chemicals is the most common route of entry a chemical can take to enter the body. The best method for reducing inhalation risk is using a less hazardous material in place of a more hazardous one. If substitution is not practical, engineering controls such as ventilation should be used to lessen the chance of exposure. The use of properly functioning local exhaust ventilation such as fume hoods, biological safety cabinets, and vented glove boxes is often required to minimize exposure to hazardous chemicals. Dilution ventilation may be used to reduce exposure to nonhazardous nuisance odors. For extremely toxic chemicals such as those classified as poison gases by State or

Federal agencies (e.g., arsine, phosgene) the use of closed systems, vented gas cabinets, fail-safe scrubbing, detection or other stricter controls may be required.

If neither substitution nor engineering controls are practical, the use of personal protective equipment, such as dust masks or respirators may be required to reduce inhalation exposures. If respirators are worn by laboratory employees, requirements of the OSHA Respirator Standard (1910.134) must be met and a written respirator program must be implemented. Currently, no laboratories in the EKU College of Arts and Sciences perform operations that require respirators.

In addition to the controls discussed above, the following general guidelines should be followed to reduce the risk of exposure to hazardous chemicals:

- minimize exposure time to hazardous materials;
- restrict access to an area where a hazardous chemical is used; and
- maintain proper signs on lab doors to indicate special hazards within.

B. Absorption

To reduce the risk of a chemical entering the body via skin and eye contact, engineering controls include substitution and ventilation as described above in Section VIA. The more obvious means of preventing skin and eye contact is by wearing personal protective equipment such as eye protection, face shields, gloves, appropriate shoes, lab aprons, lab coats, and other protective equipment as appropriate to the hazard. Since the chemical resistivity of the different types of protective equipment varies significantly, the lab supervisor should consult references to be sure that the protective equipment material is resistant to the chemical being used. Safety showers/eye wash equipment is required where corrosive chemicals are used. Such equipment should be prominently labeled and not obstructed.

C. Ingestion

Ingestion of chemicals is the least common route of entry into the body. However, a laboratory worker can easily ingest chemicals into the body via contaminated hands if they are not washed prior to eating, smoking or sticking part of the hand into the mouth. Some controls for preventing this route of exposure include engineering controls, such as isolating the hazardous substance so minimal contact is required (e.g., use glove box), personal protective equipment such as gloves, and administrative controls such as avoiding mouth pipetting, encouraging good personal hygiene and designating a well-marked nonchemical area where eating, drinking and the application of cosmetics is permitted.

VII. Employee Information and Training

A. Information

All individuals who work in laboratories where they may be exposed to hazardous chemicals must be informed about the hazards of chemicals and equipment present in their work area. This information and training must be provided before initial assignment and before new exposure situations. Equipment necessary for the safe handling of hazardous substances must be provided by the employer. **It is the responsibility of the Laboratory Supervisor to ensure that all laboratory workers have been properly trained.** The College Chemical Safety Officer will provide general training materials concerning lab safety and the EKU CHP. However, training specific for the particular lab where an employee is assigned is the responsibility of that employee's supervisor. The laboratory supervisor must maintain a written record, showing the content of the training, the date, and the names of the trainer and employee. The supervisor must determine the frequency of refresher information and training.

B. Training

Laboratory workers must be familiar with and adhere to the requirements of the CHP, other specific laboratory safety guidelines developed by their laboratory supervisor, EKU requirements and other relevant regulatory requirements (e.g. Radiation Safety).

1. General laboratory worker training must include information on:

    - Location and availability of the OSHA Lab Standard;
    - Location and availability of this Chemical Hygiene Plan;
    - Methods that can be used to obtain reference materials on chemical safety (including material safety data sheets);
    - Handling hazardous waste;
    - The work practices, personal protective equipment, and emergency procedures to be used to ensure that the employee may protect himself/herself from overexposure to hazardous chemicals.

    The manufacturer's material safety data sheets (MSDS) will generally contain much of the information needed to comply with the information and training requirements of the OSHA Lab Standard. Laboratory supervisors and employees should understand the relevant MSDS and/or other comparable literature on the hazardous chemicals which are used or stored in their laboratory. The employee's supervisor must provide additional training for specific lab hazards.

    Copies of MSDS may be obtained from the chemical supplier or on the Internet. Individual departments or laboratories are strongly encouraged to maintain their own files of reference materials.

2. Special Hazards

    Special hazards that apply only to a specific laboratory are to be identified by the laboratory supervisor. The supervisor is responsible for training the workers in that laboratory on these special hazards, and for maintaining documentation of this training. The training should include information on

    - The permissible exposure limits for OSHA regulated substances;
    - Signs and symptoms associated with exposure to the hazardous chemicals found in the lab;
    - The detection methods that may be used to detect the presence or release of a hazardous chemical.

VIII. Prior Approval

The responsibility for approval of the acquisition and use of toxic chemical agents rests with the laboratory supervisor. Some materials including toxic compressed gases, radioactive materials, and certain recombinant DNA and biohazards require prior internal or external approval at various levels. The laboratory supervisor should contact the Chemical Safety Officer regarding approval for use of highly hazardous materials or operations.

IX. Medical Consultation

An opportunity for laboratory workers to receive medical consultation must be provided if an employee develops any symptoms thought to arise from chemical overexposure or after an event such as a major spill, leak or explosion which may have resulted in an overexposure.

These suspected or actual exposures requiring medical evaluation can and should be treated as a regular Workers Compensation claim. The injured employee must fill out an Accident - Occupational Injury/Illness Report Form and go to an appropriate medical facility (e.g. occupational medicine clinic, employee health, qualified outside physician, etc.) for treatment. Following notification of overexposure, arrangements for an appropriate medical examination must be completed before the exposed individual may return to work.

Any medical examination required by this Plan must be provided without cost to the employee, without loss of pay and at a reasonable time and place. Records of any medical examination will be maintained at the medical facility providing service or with appropriate medical personnel at the University.

X. Special Provisions for Select Carcinogens, Reproductive Toxins and Acutely Toxic Chemicals

The laboratory supervisor must make provisions for additional employee protection for work with particularly hazardous substances. These include select carcinogens, reproductive toxins and substances which have a high degree of acute toxicity. The Chemical Safety Committee can provide information about these substances. The following provisions must be included:

1. Establishment of a designated area;
2. Use of containment devices such as fume hoods or glove boxes;
3. Procedures for safe removal of contaminated waste; and
4. Decontamination procedures.

In addition to the general safety guidelines mentioned in the first section and throughout the Plan, special precautions are needed when handling genotoxins, reproductive toxins and chemicals with a high degree of acute toxicity. Minimum guidelines that should be followed are listed below. The lab supervisor should ensure that these and other precautions designed to minimize risk of exposure to these substances are taken.

- Quantities of these chemicals used and stored in the laboratory must be minimized, as should their concentrations in solution or mixtures.

- Work with genotoxins, reproductive toxins and acutely toxic chemicals must be performed within a certified functioning fume hood, biological safety cabinet, ventilated glove box, sealed system, or other system designed to minimize exposure to these substances. (The exhaust air from the ventilation systems may require scrubbing, or other treatment, before being released into the atmosphere.) In all cases, work with these types of chemicals must be done in such a manner that the OSHA permissible exposure limits or similar standards are not exceeded.

- Compressed gas cylinders which contain acutely toxic chemicals such as arsine, chlorine, and nitrogen dioxide must be kept in well-ventilated areas.

- The ventilation efficiency of the designated fume hood, glove box or gas cabinet, and the operational effectiveness of mechanical and electrical equipment used to contain or manipulate these special substances should be evaluated periodically by the laboratory personnel at intervals determined by the laboratory supervisor.

- Each laboratory utilizing these substances must designate an area for this purpose and must sign or mark this area with an appropriate hazard warning. The designated area may be an entire laboratory

(bio-safety level three or four require that the ENTIRE laboratory be designated), an area of the laboratory or a device such as a fume hood or glove box. The designated area should be marked with a **DANGER, specific agent, AUTHORIZED PERSONNEL ONLY** or comparable warning sign.

- All laboratory workers who work in a laboratory which has an area designated for use with genotoxins, reproductive toxins, and acutely toxic chemicals must be trained about the deleterious effects of these substances as well as signs and symptoms regarding exposure to these substances, whether or not they actually work with the substance themselves. Training to ensure the safe handling and storage of these substances is required for those who use these materials. This training is the responsibility of the laboratory supervisor and must be done prior to the use of any of these materials.

- Laboratory workers working with these chemicals must have access to appropriate protective equipment and clothing and must be trained on how to properly utilize the safety equipment.

- Detection equipment may be required in laboratories where chemicals (especially poisonous gases) with a high degree of acute toxicity are utilized.

- The designated working area must be thoroughly and appropriately decontaminated and cleaned at regular intervals determined by the laboratory supervisor. The interval may be as short as one day or as long as six months depending upon the frequency of usage and level of hazard.

- Special precautions to avoid release and exposure to highly toxic chemicals, genotoxins and reproductive toxins must be utilized. For instance, volatile substances should be kept cool and contained; gases should have properly functioning valves, check valves, regulators, containment which can withstand pressure buildup, and appropriate piping; and dispersive solids should be kept in closed containers, used in places with minimum air currents, and appropriate contact materials should be used to avoid static charging.

XI. Emergencies

A. University Guide for General Emergency Response

Information about responding to general emergencies, such as weather, utilities, etc, can be found at the EKU Public Safety page (8).

B. Planning

Planning for emergencies is an essential component of laboratory safety. Workers in labs should have the knowledge necessary to assess their risks from a small spill or release of a chemical or a fire, if they have received proper training. The most important aspect of this training is being able to differentiate between an incidental situation and an emergency.

An incidental release is one that does not cause an imminent serious health or safety hazard to lab workers. Lab workers should prepare for and handle their own incidental spills or releases. Absorbent materials should be available in all laboratories for small spills.

Serious emergencies are those posing an immediate and serious risk of injury or illness to lab workers. These situations could include:

- Release of high concentrations or large quantities of toxic substances;
- High potential for an oxygen deficient atmosphere;
- Conditions that pose a fire or explosion hazard.

C. Response For Selected Emergencies

Generally, laboratory personnel should respond to serious emergencies *only if they are formally trained or certified to do so*. Employees are expected to respond to incidental situations.

1. Small fires, small volume chemical spills

Small localized fires, such as a fire in a chemical container, can be put out by smothering the fire with a fire-resistant material. Slightly larger fires can be extinguished by a person trained in the use of fire extinguishers.

Minor spills of chemicals should be cleaned up immediately by lab personnel. Absorbent materials will be available in all laboratories to absorb acidic, basic, or organic spills. Absorbent towels will also be available. The person cleaning up the spill should avoid contact with the hazardous material. Contact the Chemical Storage Facility Manager for information on disposal.

2. Large fires or Release of large amount of toxic material

If the employee judges that the fire is too large to be handled without danger to the employee, emergency personnel should be contacted. Actual emergency conditions may require that the actions be followed in a different order, depending on the layout of the laboratory, time of day, the number of people present and the location of the emergency relative to doors and alarm stations or telephones.

(a) Alert personnel in the immediate vicinity.
(b) Call 911 or other emergency response personnel from a safe location. Remain on the line until all necessary information has been given to the responding organization.
(c) Confine the fire or emergency if it is possible to do so without endangering yourself.
(d) Shut hood sash if possible.
(e) Close doors to prevent spread of vapors, gases or fire.
(f) Evacuate the building or hazardous area.

3. Minor burns or injuries

Minor burns or injuries are those that can be easily treated by the injured person. Treatment could include running cold water over a burn, or applying a band-aid to a small cut.

4. Serious but not life-threatening burns or injuries

If the burn or injury is serious enough that self-medication is not sufficient, the person should seek medical attention. The student health center is located in Rowlett Building. Another person should accompany the person who needs medical attention.

5. Life-threatening burns, injuries or illness

In situations where burns or injuries are life threatening, medical personnel should be summoned to the lab by calling 911. Other laboratory personnel should take only those actions that will prevent additional harm to the person. No medical treatment should be administered to the injured person unless the person administering the treatment is trained and certified to perform the treatment.

If a person is on fire, the following actions can be taken:

(a) Stop the person on fire from running! Do not allow anyone to run, not even to a fire blanket.
(b) Drop the person to the floor. Standing will allow flames to spread upward to eyes and nose.
(c) Roll the person to snuff out the flames.
(d) Cool the person. Remove smoldering clothing. Use cold water or ice packs to cool burns and minimize injury.
(e) Get medical assistance immediately.

6. *Chemical exposure*
   If a person has suffered a widespread chemical exposure to the body and/or eyes, other persons should help the injured person get to the safety shower and eyewash. The most important emergency measure if chemicals are splashed to the eyes or skin is immediate flushing with water. Most splashes need at least 15 minutes of washing. Get medical assistance immediately.

XII. Inspections and Housekeeping

A. Housekeeping

1. Laboratories should be kept free of clutter. Working areas should be cleaned up at the end of each operation and at the end of each day.
2. Safety showers, eyewash fountains, and fire extinguishers shall be kept free from any obstruction that would prevent access and use. Access to emergency exits shall be kept clear at all times.
3. Circuit breaker panels shall have an unobstructed clearance of 30".
4. The floor shall be kept clean and free of slip hazards by reasonable cleaning and immediate clean up of spills.
5. Old containers, compromised containers, and solid chemical wastes should be disposed of promptly and not allowed to accumulate.
6. The laboratory supervisor is responsible for proper cleanup of hazardous materials in his/her laboratory.
7. Custodial staff will perform routine cleanup, such as emptying wastebaskets and sweeping floors.
8. Custodial staff will not routinely clean lab bench tops unless the laboratory supervisor specifically requests this and can ensure custodians that no hazardous materials will be present on the lab tops. If cleaning is requested, the lab supervisor must also ensure that anything that is not to be cleaned or moved is marked appropriately.
9. Custodians shall NOT be asked to clean up spills of any hazardous material.

B. Inspection and Maintenance

1. Temperature control and over-temperature shutoff devices on heating equipment should be tested in accordance with manufacturer recommendations to ensure proper operation.
2. All automatic shutoff devices should be tested in accordance with manufacturer recommendations to ensure proper operation.
3. Explosion shields and isolation devices should be visually inspected by the user for cracks or other damage before each use.
4. Laboratories shall be inspected at least annually by CSO. Appendix 6 provides a sample checklist for the inspections.

XIII. Records

The following records shall be maintained:

A. Safety training records are maintained by the CSO or, for special hazards training, by the Laboratory Supervisor.
B. Annual inspection reports of the laboratories are maintained by the CSO.
C. Each department should maintain a list of all personnel who have access to the building after hours. This list should include emergency contact information for each person.
D. The department chairs shall maintain copies of all incident reports submitted to them.

REFERENCES

References Cited in Text

1. The OSHA Lab Standard (29 CFR 1910.1450): http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10106&p_text_version=FALSE

2. General information about the OSHA Hazard Communications Program: http://www.osha.gov/SLTC/hazardcommunications/index.html

3. *Safety in Academic Chemistry Laboratories*, Volume 1 and 2. American Chemical Society, 7th Edition, 2003.

4. Personal Protective Equipment (PPE) information from NIOSH: http://www.cdc.gov/niosh/npptl/topics/protclothing/

5. Gloves: search for the best glove for a variety of hazardous materials: http://www.chemrest.com/

6. The Chemical Reactivity Worksheet is a free program you can use to find out about the reactivity of substances or mixtures of substances. http://response.restoration.noaa.gov/chemaids/react.html

7. Furr, A. Keith. *CRD Handbook of Laboratory Safety*. Boca Raton: CRC Press, 2000, pp. 243-244.

8. EKU Public Safety: http://www.publicsafety.eku.edu/guide/

General References

MSDS sheets from Cornell University: http://msds.ehs.cornell.edu/msdssrch.asp

Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, National Academy of Sciences, National Academies Press, 1995. Online version: http://books.nap.edu/books/0309052297/html/index.html

American Industrial Hygienists Association (AIHA) Laboratory Safety Information and Links http://www2.umdnj.edu/eohssweb/aiha/technical/organizations.htm

Appendix 1. Personnel Listing

Academic Year 2006-2007

Dean of the College of Arts and Sciences:	Dr. Andrew Schoolmaster, 622-1405
Associate Dean of the College of Arts and Sciences	Dr. Gary Kuhnhenn, 622-8140
Art Department Chair	Dr. Herb Goodman, 622-1629
Biological Sciences Department Chair	Dr. Michael Foster, 622-1531
Chemistry Department Chair	Dr. Alan Schick, 622-1456
Earth Sciences Department Chair	Dr. Melissa Dieckmann, 622-1273
Physics Department Chair	Dr. Mark Biermann, 622-1521
Environmental Research Insititute (ERI) Director	Dr. Alice Jones, 622-1424
Chemical Safety Officer	Dr. Diane Vance, 622-2908
Chemical Storage Facility Manager	Mr. Larry Miller, 622-6355

Chemical Safety Committee

Art Department representative:	Dr. David Afsah-Mohallatee, 622-1633
Biological Sciences Department representative:	Dr. Marcia Pierce, 622-1535
Chemistry Department representative:	Dr. Diane Vance, 622-2908
Earth Sciences Dept and ERI representative:	Dr. Danita LaSage, 622-1506
Physics Department representative:	Dr. Marco Ciocca, 622-6172
Chemical Storage Facility Manager:	Mr. Larry Miller. 622-6355
Biological Sciences Laboratory Manager:	Mr. Tim Weckman, 622-1533
Radiation Safety Officer:	Dr. Diane Vance, 622-2908
Director of Risk Management and Insurance:	Mr. G.W. Newsom, 622-5523
University Counsel:	Cheryl K. Harris, Esq., 622-6693

Appendix 2. Personal Protective Equipment Guidelines for Hazardous Material Handling

Hazard Assessment And Personal Protective Equipment Guidelines For General Laboratory Operations

Hazard	Personal Protective Equipment Recommended		
	Eye	**Face**	**Hand/Skin/ Body**
Any laboratory use of hazardous chemicals	Safety glasses with side shields **required** at all times		Lab coat
Use of corrosive chemicals, strong oxidizing agents, carcinogens, mutagens, etc.	Chemical splash goggles	Full face shield and goggles (for work with over 4 liters of corrosive liquids, or with any volume of concentrated corrosives)	Resistant gloves (See Appendix 2A for chemical resistance of common glove materials) Impervious lab coat, coveralls, apron, protective suit (for work with over 5 gallons corrosive liquids)
Temperature extremes	Face shield required for transfer of cryogenic materials	Face shield required for transfer of cryogenic materials	Insulated gloves for handling ovens, furnaces, cryogenic bath and other devices over 100° C or below -1° C
Sharp objects (broken glass, insertion of tubes or rods into stoppers)			Heavy cloth barrier or leather gloves

Appendix 2a.

GLOVE RECOMMENDATIONS FOR COMMON SOLVENTS (a)

CHEMICAL	**BUTYL** (30 mil)	**NATURAL RUBBER**	**NEOPRENE**	**NITRILE** (15 mil)	**VITON** (30 mil)
Acids & Bases	--	--	E	--	--
Acetone	E	--	G (hw)	--	--
Acetonitrile	E	--	G	F	--
Benzene	--	--	F	F	E
Carbon tetrachloride	--	--	--	E	E
Chlorobutane	--	--	--	E	--
Chlorform	--	--	F	F	E
Cyclohexane	--	--	G	E	E
Diethyl Ether [b]	--	--	--	G	--
Dimethyl Formamide	E	E	G	--	--
Dimethyl Sulfoxide	E	--	E	G	--
Dioxane	E	G	G	G	--
Ethanol	E	E	E	E	E
Ethyl Acetate	E	G	--	F	--
Hexanes	--	--	G	E	E
Methanol	E	--	G	G	E
Methylene Chloride [b]	F	--	F	F	G
Pentane	--	--	G	E	E
2-Propanol	E	E	E (hw)	E	E
Pyridine	F	G	--	--	G
Tetrahydrofuran [b]	--	--	F	--	--

Toluene	F	--	F	--	E
Xylenes	--	--	G (hw)	--	E

Source: Forsberg and Keith (1989) Chemical Protective Clothing Performance Index Book, J. Wiley & Sons, Inc.

(a) Assumes at least 14 mil thick unless stated otherwise

(b) Best glove available is PVA (polyvinylalcohol) - special order

(hw) = heavy weight usually 20-30 mil thick

E = Excellent - 8 hour full immersion protection

G = Good - 20 to 60 minute immersion protection

F = Fair - 2 to 19 minute immersion protection

From: NIST Materials Science and Engineering Laboratory
Last modified 21-March-2002

Appendix 3. Examples of Incompatible Chemicals

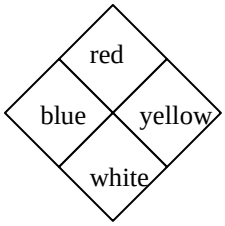
(source: reference 7)

Chemical	Incompatible for Chemical Storage
Acetic acid	Aldehyde, bases, carbonates, chromic acid, ethylene glycol, hydroxides, metals, oxidizers, perchloric acid, peroxides, permanganates, phosphates, xylene
Acetone	Acids, e.g., concentrated nitric and sulfuric, amines, oxidizers, plastics
Acetylene	Copper metal, halogens, mercury, potassium, silver, including their compounds, oxidizers
Alkalis	Acids, carbon dioxides, chlorinated hydrocarbons, chromium, mercury, oxidizers, salt, sulfur, water
Anhydrous ammonia	Acids, aldehydes, amides, calcium hypochlorite, hydrogen fluoride, mercury, oxidizers, sulfur
Ammonium nitrate	Acids, alkalis, chlorates, fine organic powders, metals, nitrates, oxidizers, sulfur
Aniline	Acids, e.g., nitric, aluminum, dibenzoyl peroxide, hydrogen peroxide, oxidizers
Azides	Acids, heavy metals, oxidizers
Bromine	Acetaldehyde, acetylene, alcohols, alkalis, amines, butadiene, butane, ethylene, fluorine, hydrogen, ketones, metals (finely divided), sodium carbide, sulfur, turpentine
Calcium oxide	Acids, ethanol, fluorine
Carbon (activated)	Alkalis, all oxidizing agents, calcium hypochlorite, halogens
Carbon tetrachloride	Benzoyl peroxides, ethylene, fluorine, oxygen, silanes
Chlorates	Acids, ammonium salts, carbon, metal powders, sulfur, finely divided combustibles and organics
Chromic acid	Acetic acid, acetone, alcohols, alkalis, ammonia, bases, camphor, flammable liquids, glycerine, turpentine
Chromium trioxide	Benzene, phosphorus, hydrocarbons, metals, other organics
Copper	Acetylene, calcium, hydrogen peroxide, oxidizers
Cyanides	Acids, alkalis, strong bases
Flammable liquids	Ammonium nitrate, chromic acid, hydrogen peroxide, nitric acid, sodium peroxide, halogens
Fluorine	Ammonia, halocarbons, halogens, ketones, metals, organic acids, hydrocarbons, other combustible material
Hydrocarbons	Acids, bases, oxidizers
Hydrofluoric acid	Glass, organics, sodium
Hydrogen peroxide	Acetaldehyde, acetic acid, acetone, alcohols, aniline, carboxylic acid, flammable liquids, metals (or their salts), nitric acid, nitromethane, organics, phosphorus, sodium, sulfuric acid
Hydrogen sulfide	Acetaldehyde, oxidizers, e.g., fuming nitric acid, oxidizing gases, sodium
Hypochlorites	Acids, activated carbon
Iodine	Acetaldehyde, acetylene, ammonia, hydrogen, sodium
Mercury	Acetylene, aluminum, amines, ammonia, calcium, fulminic acid, lithium, oxidizers, sodium
Nitrates	Sulfuric acid, other acids, nitrites
Nitric acid (concentrated)	Acetic acid, acetonitrile, amines, ammonia, aniline, bases, benzene, brass, chromic acid, copper, cumene, flammable liquids and gases, formic acid, heavy metals, hydrogen sulfide, ketones, organic substances, sodium, toluene
Nitrites	Acids
Nitroparaffins	Amines, inorganic bases
Oxalic acid	Mercury, oxidizers, silver, sodium chlorite
Oxygen	Acetaldheyde, alkalis, alkalines, ammonia, carbon monoxide, ethers, flammable gases, liquids, solids, hydrocarbons, phosphorus
Perchloric acid	Acetic acid, acetic anhydride, alcohols, aniline, bismuth and bismuth alloys,

	combustible materials, dehydrating agents, ethyl benzene, hydriotic acid, hydrochloric acid, grease, iodides, ketones, other organic materials, oxidizers, pyridine
Peroxides, organic	Acids (inorganic, organic)
Phosphorus	Air, alkalis, oxygen, reducing agents
Potassium	Acetylene, acids, alcohols, carbon dioxide, carbon tetrachloride, halogens, hydrazine, mercury, oxidizers, selenium, sulfur
Potassium chlorate	Acids, e.g., sulfuric, ammonia, combustible materials, fluorine, hydrocarbons, metals, organic substances, sugars
Potassium perchlorate	Acids, e.g., sulfuric, alcohols, combustible materials, fluorine, hydrazine, metals, organic materials, reducing agents
Potassium permanganate	Benzaldehyde, ethylene glycol, glycerol, sulfuric acid
Selenides	Reducing agents
Silver	Acetylene, ammonia, ammonium compounds, fulminic acid, oxalic acid, oxidizers, ozonides, peroxyformic acid
Sodium	Acids, carbon tetrachloride, carbon monoxide, hydrazines, metals, oxidizers, water
Sodium nitrate	Acetic anhydride, acids, metals, organic matter, peroxyformic acid, reducing agents
Sodium nitrite	Ammonium nitrate and ammonium salts
Sodium peroxide	Acetic acid (glacial), acetic anhydride, benzene, benzaldehyde, carbon disulfide, ethyl acetate, furfural, glycerin, hydrogen sulfide metals, methyl acetate, peroxyformic acid, phosphorus
Sulfides	Acids
Sulfuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate like compounds of sodium and lithium
Tellurides	Reducing agents

Appendix 4. National Fire Protection Association (NFPA) Hazard Diamond

This labeling system uses 4 diamonds of different colors to denote various types of hazards. Within each colored diamond is a number that indicates the level of hazard for the material.



Health (Blue Diamond)

0 No health hazard when used with responsible care.
1 *Slightly toxic material*. May cause irritation, but only minor residual injury even without treatment.
2 Moderately toxic material. Intense or continued exposure could cause temporary incapacitation or possible residual injury unless prompt medical treatment is given.
3 *Seriously toxic material*. Short term exposure could cause serious temporary or residual injury even though prompt medical treatment is given. Includes known or suspect small animal carcinogens, mutagens or teratogens.
4 *Highly toxic material*. Very limited exposure could cause death or major injury even though prompt medical treatment is given. Includes known or suspect human carcinogens, mutagens or teratogens.

Flammability (Red Diamond)

0 Materials which will not burn.
1 *Slightly combustible*. Material which requires considerable preheating before ignition can occur. This rating includes most ordinary combustible materials.
2 *Combustible*. Materials which must be moderately heated before ignition can occur. Includes liquids having a flash point above 100 degrees F, and solids which readily give off flammable vapors.
3 *Flammable*. Liquids and solids that can be ignited under almost all ambient temperature conditions. Includes liquids with a flash point below 73 degrees F and a boiling point above 100 degrees F, solid materials which form coarse dusts that burn rapidly without becoming explosive, materials which burn rapidly by reason of self-contained oxygen (i.e. organic peroxides), and materials which ignite spontaneously when exposed to air.
4 *Extremely flammable*. Materials which will rapidly vaporize at normal pressure and temperature and will burn readily. Includes gases, cryogenic materials, any liquid or gaseous material having a flash point below 73 degrees F and a boiling point below 100 degrees F, and materials which can form explosive mixtures with air.

Reactivity (Yellow Diamond)

0 Materials which are normally stable, even under fire conditions, and which are not reactive with water.
1 Materials which are normally stable, but which can become unstable at elevated temperatures and pressures, or which may react with water with some release of energy, but not violently.
2 Materials which in themselves are normally unstable and readily undergo violent chemical change, but do not detonate. It includes materials which may react violently with water or which may form potentially explosive mixtures with water.

3 Materials which in themselves are capable of detonation but which require a strong initiating source, or which must be heated first. This rating includes materials which are shock sensitive at elevated temperatures, and which react explosively with water without requiring heat.

4 Materials which in themselves are readily capable of detonation or explosive decomposition at normal temperatures and pressures. Includes materials which are shock sensitive at normal temperatures and pressures.

Special Notice (White Diamond)

OX Denotes materials that are oxidizing agents. These compounds give up oxygen easily, remove hydrogen from other compounds or attract negative electrons.

~~W~~ Denotes materials that are water reactive. These compounds undergo rapid energy releases on contact with water.

Appendix 5. Sample Laboratory Identification Sign

IN CASE OF EMERGENCY CALL 911

Room Number_____ Department_____

Laboratory Supervisor/Principal Investigator_____

Emergency Contacts for laboratory:

Name	Office Location	Office Phone	Home Phone
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Special Hazards/Instructions:_____

_____

_____

Prepared by:_____ Date Posted:_____

Appendix 6. Sample of Laboratory Inspection Guidelines

Department: _____ Building & Room Number _____

Lab Supervisor: _____

Inspector(s) _____Date: _____

Item	S	U	Comment/Follow-up
Entrances, exits, halls unobstructed			
Showers and eye washes operative; inspection dates current			
Personal protective equipment present and in good condition			
Fire extinguishers present; inspection dates current			
Gas cylinders stored upright and properly secured			
Laboratory identification sign is present and has current information			
Fume hoods are operating properly; inspection is current			
Chemicals are properly labeled			
Chemical inventory is readily accessible			
Chemicals are stored properly			
Appropriate storage cabinets are present and in good condition (if needed)			
First aid kits are present and stocked			
Spill control materials are present			
Gas cut-off present and operational			
A phone is readily accessible for emergency use			
Housekeeping			
Other (attach extra sheet if needed)			

Appendix 7. Emergency Numbers

2006-2007

Campus Emergency 911

EKU Public Safety 622 - 2821

Infirmary 622 – 1761

Energy Management System, 622-1438
(for physical plant problems after regular hours, weekends)

Facilities Services 622-2966
(for physical plant problems during regular working hours)

Chemical Safety Officer:
Dr. Diane Vance, 622-2908 diane.vance@eku.edu

Chemical Storage Manager:
Larry Miller, 622-6355 lawrence.miller@eku.edu

Radiation Safety Officer:
Dr. Diane Vance, 622-2908 diane.vance@eku.edu

Van Service for transportation to cars 6:00 p.m. to 2:00 a.m. 622-2821

Art Department Chair: Dr. Herb Goodman , 622-1629
Biological Sciences Department Chair: Dr. Michael Foster, 622-1531
Chemistry Department Chair: Dr. Alan Schick, 622-1456
Earth Sciences Department Chair: Dr. Melissa Dieckmann, 622-1273
Physics Department Chair: Dr. Mark Biermann , 622-1521