



Natural Sciences Department

Biosafety Manual

2019-2020

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I. OVERVIEW

Purpose

Daemen College has developed this biosafety manual in compliance with the Occupational Safety and Health Administration (OSHA) standard, "Occupational Exposure to Bloodborne Pathogens." The standard requires the use of specific precautions with all clinical specimens of blood or other potentially infectious material. This manual describes guidelines and rules for safe operation of laboratories and performance of experiments involving biological agents at Daemen College.

Scope

This plan sets forth procedures, equipment, personal protective equipment and work practices to protect employees from potential health hazards presented by biohazardous materials used in the workplace. For purposes of this manual, a "biohazardous agent" is defined as one that is capable or potentially capable of producing an undesirable effect upon man or the environment. The agent may be a biological or metabolic product, chemical or physical in nature.

At a minimum, this manual covers employees (including student employees, technicians, researchers and faculty) who use in teaching and research, laboratories at Daemen College. While the standard applies to employees, it is the policy of Daemen College that all users of the laboratories, including students and visitors, will be given training on practices and procedures related to biohazards and safe laboratory practices. It is incumbent upon the College as a community to ensure that all users read and understand these procedures and practices. Specific responsibilities are outlined as follows:

Responsibilities

Daemen College President Gary A. Olson has the ultimate responsibility for chemical hygiene throughout the laboratories and with assistance of other program administrators, will provide continued support for chemical hygiene.

Chemical Hygiene Officer

Derrick Swartz, Chemistry Lab Coordinator, serves as Daemen College's Chemical Hygiene Officer. Responsibilities of the Chemical Hygiene are listed in the Chemical Hygiene Plan.

Principal Investigator: Principal Investigators are responsible for biosafety as it relates to their projects. Principal investigators are additionally responsible for complying with regulations set out by external funding agencies and for communicating any additional sponsor regulations to the Chemical Hygiene Officer, Institutional Safety Officer, and faculty, students, employees, and associates involved directly with the sponsored project.

Laboratory Workers (faculty, research assistants)

The laboratory workers are individually responsible for planning and conducting each laboratory operation in accordance with the Chemical Hygiene Plan and Biosafety manual. A list of each laboratory supervisory is provided in the facilities and supervision list.

II. FACILITIES AND SUPERVISION

Description of Facilities

The Natural Sciences Department has teaching laboratories on the west end of the second and third floor of Duns Scotus Hall and on the first floor of Schenck Hall. Research facilities are located in specific labs (DS 210, DS 307, DS 312 and SH 101b).

Each room has a responsible staff member or members who ensure that chemicals are stored appropriately and safety guidelines are followed. Table 1 lists the facilities, responsible parties and contact information.

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Table 1. Facilities Descriptions and Responsible Parties

Room Number	Description	Special Equipment	Supervisor(s)	Phone (839-
DS 201/203	Chemistry Teaching Lab	Balances, Hoods	Mr. Derrick Swartz	8425
DS 202/204	Chemistry Teaching Lab	Hoods, AA	Dr. Robert Gunther Dr. Kathleen Murphy Dr. Kristi Liddell	8419 8236 566-7819
DS 203b	Chemistry Stockroom	Chemical Inventory	Mr. Derrick Swartz	8425
DS 206 / 208	Physics Teaching lab	Computers Physics equipment	Dr. Robert Selkowitz	8326
DS 204b	Undergraduate Research lab	Microscope, plate reader	Dr. Robert Gunther	8419
DS 205/207	Chemistry Teaching Lab	Hoods / FTIR	Dr. Caitlyn Montross Dr. Kristi Liddell	8405 566-7819
DS 210/212	Chemistry Research/Teaching, Dept. Computer Lab	Instruments, balances, Computers	Dr. Kristi Liddell	566-7819
DS 301/303	Biology teaching Lab	Microscopes, computers, osmometer, thermocyclers, gel imaging station, Nanodrop UV	Ms. Cynthia Russell	8234
DS 302/304	Biology Teaching Lab	Microscopes	Ms. Cynthia Russell	8234 8366
DS 306	Biology Stockroom	Chemical Inventory, Centrifuge, Freezer, environmental chambers, preserved specimens	Ms. Cynthia Russell	8234
DS 307/311	Student Biology Research	Microscopes, balances	Dr. Diane Ramos, Dr. Sarah Whorley	8560 8564
DS 308/310	Biology Teaching Lab	Microscopes	Ms. Cynthia Russell Dr. Jonathan Good	8234 8366 566-7845
DS 313/315	Biology Teaching Lab	Microscopes, Incubators	Dr. Doug Kalinowski, Dr. Diane Ramos	8546 8560
DS 312	Natural and Health Sciences Research Center	Freezer, Microscope, Computers, Image analysis, preserved specimens	Dr. Laura Edsberg	8351

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SH 109	Biology Teaching Lab	Preserved specimens	Dr. Domenic D'Amore	566-7840
SH 101b	Biology Research	Growth Chambers	Dr. Jeffrey Law	566-7869
SH 110	Biology Teaching Lab (Physical Therapy Dept.)	Preserved specimens	Dr. Gary Styn	8529

Access

The facilities are for the exclusive use of Daemen staff and students affiliated with and working on specifically approved research projects as well as students enrolled in a laboratory course. Other use requires approval of the Director of the facility.

Orientation to Lab Procedures

All student users must read the lab procedure guide and attend an orientation session led by a Daemen staff member. For laboratory courses, the first class meeting provides an introduction to the lab and a discussion of the appropriate safety procedures. Students are expected to sign a copy of the laboratory rules and submit the copy as indication of their understanding of the appropriate procedures. New staff members should meet with the laboratory coordinator for a similar orientation session.

Keys

Keys are issued to approved Daemen staff members. Sharing of keys or permitting unauthorized access to the facility is not allowed. Students are not typically given keys to chemistry laboratories. Access to facilities can be provided by Daemen Security, provided that prior approval from the appropriate faculty supervisor is given.

Hours of Operation

The laboratory facilities are open to approved faculty researchers both day and night, weekdays and weekends. Students in classes may not be in laboratory rooms (except DS 212) without a faculty or staff member present. If a student is completing independent research, his or her faculty research mentor is responsible for supervision in the laboratory setting. Certain instruments and procedures may be restricted to the normal work day, or only allowed in the presence of a designated staff member.

Computer Use

Computers are available for Natural Sciences faculty, staff and students in DS 212. As noted in the departmental student handbook, students must submit an application prior to using these computers. Excessive printing will result in loss of privilege. Computer abuse is a violation of college policy.

Communication regarding changes to this Handbook

E-mail will be the primary mechanism for notification of changes in procedure, facilities or equipment.

Equipment Users

Access to the laboratory does not of itself permit use of any particular instrument. Most departmental equipment is available for use by any faculty member after orientation to that equipment. Each major instrument is under the charge of a staff member who can train users on that instrument and is responsible for the maintenance of that equipment. Student use of equipment requires faculty/staff training and supervision. Problems with equipment malfunctions, breakage, etc. should be reported to the appropriate staff member. Do not try to fix or adjust anything yourself.

III. LABORATORY PRACTICES

Standard Laboratory Safety Practices

- No eating, drinking or smoking is permitted.
- Pipetting by mouth is strictly prohibited.
- Storage of food and drink is limited to non-laboratory areas.
- Cosmetics and/or lip balm must not be applied in the labs.
- Proper hygiene includes frequent hand washing, especially prior to leaving the laboratory.
- Lab coats or special clothing required in containment areas must be worn, buttoned, in the laboratory and removed when moving outside of the laboratory.
- Gloves must be worn whenever potentially biohazardous materials are handled.
- Glass and sharp objects must be disposed of in specially marked containers.
- Lab benches must be cleaned regularly. In the event of spills or contamination cleanup is to be done immediately.
- Animals not involved in the project are not permitted in the laboratories.

Laboratory Safety Practices Specific to Working with Biohazardous Materials

The Centers for Disease Control, OSHA, and the medical community recommend implementing the principle of "universal precautions."

Under universal precautions, **blood and certain body fluids of all patients are considered potentially infectious for human immunodeficiency virus (HIV), hepatitis B virus and other bloodborne pathogens.**

In addition to the standard laboratory safety practices, the following additional precautions should be taken when working with potentially biohazardous materials:

1. Hands should be washed immediately after completion of any procedure in which biohazardous material is used. Be especially careful not to inadvertently touch the face or eyes with unwashed hands.
2. Use cleaning tissue rather than cloth/cloth handkerchiefs when handling infectious materials.

3. Rubber or plastic gloves should be worn when working with an agent which may cause infection by entry through skin abrasions. Latex or vinyl gloves are used for medical, dental, and laboratory procedures. Heavy duty utility gloves may be used for housekeeping duties. Gloves must be worn when one anticipates hand contact with blood, potentially infectious materials, mucous membranes, or non-intact skin.
4. Vinyl and latex single-use, disposable gloves should be replaced as soon as possible if contaminated, torn, punctured or damaged in any way. **Never wash disposal gloves or decontaminate for reuse.** Also do not touch door or equipment handles with contaminated gloves, keep one hand free for such activities or change your gloves prior to touching doors and devices.
5. Be aware of the possibility of latex allergies, which can be life-threatening to some individuals. When chemical hazards are also present more extensive consideration of the many available types of glove materials is necessary.
6. Keep jewelry to a minimum and do not wear dangling jewelry in the lab.
7. Safety glasses must be worn in the Daemen laboratories when instructed by a staff member. Safety glasses are provided for student use or may be purchased. Students who repeatedly refuse to wear their eye protection will be asked to permanently leave the lab.
8. Contact lens wearers should exercise caution when working with chemicals, including preservatives associated with dissection material. Individuals who wear contacts do so at their own risk.
9. Procedures or activities likely to produce aerosols of infectious material must be conducted in an approved biological safety cabinet. Insure proper experimental set up in the biosafety cabinet and proper use of the cabinet by personnel.
10. Use of needles and syringes should be limited to situations in which there is no alternative, and the recommendations for preventing injuries with needles should be followed. Alternative safety devices should be used when available.
11. Exercise caution when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles. Do not recap used needles by hand. Do not remove used needles from disposable syringes by hand. Do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture resistant containers for disposal. Locate the puncture resistant containers as close to the work site as is practical. Dispose of contaminated pipettes or broken glass in appropriate biohazard containers.
12. Immediately and thoroughly wash hands and other skin surfaces that are contaminated with blood, body fluids containing visible blood, or other body fluids. It is good practice to wash hands frequently throughout the day as well, as a routine measure.
13. All specimens of blood and body fluids should be put in a well-constructed container with a secure lid to prevent leaking during transport. Care should be taken when collecting each specimen to avoid contaminating the outside of the container and the laboratory form accompanying the specimen. All persons processing blood and body-fluid should wear gloves. Masks and protective eyewear should be worn if mucous-membrane contact with blood or body fluids is possible. Gloves should be changed and hands washed after completion of specimen processing.
14. Biological safety cabinets should be used whenever procedures are conducted that have a high potential for generating droplets.

15. Laboratory work surfaces should be decontaminated with an effective chemical germicide after a spill of blood or other body fluids and when work activities are completed for the day. A routine daily decontamination at the end of the workday is a standard minimum decontamination schedule when work is ongoing, regardless of work activities
16. Contaminated materials used in laboratory tests should be decontaminated before reprocessing or be placed in bags and disposed of in accordance with current policies for disposal of infectious waste.
17. Equipment that has been contaminated with blood or other body fluids should be decontaminated and cleaned before being repaired in the laboratory or transported to the manufacturer.

Safety is an overriding concern in all Daemen laboratory activities. As a general rule, **anyone violating any safety rule or otherwise compromising his or her personal safety or the safety of others will be denied future access to the laboratory.**

These suspensions are at the discretion of the department chair, lab coordinators or research director.

Visitors

Visitors should be escorted through laboratory facilities and should not enter a laboratory without appropriate eyewear, if experiments requiring eye protection are in progress. Only approved faculty or staff may escort visitors into lab facilities.

Student Storage

A limited amount of storage space, mostly in the form of small drawers, is available for student use in the laboratories. These drawers should be kept neat and emptied at the end of the semester or termination of the research project. Personal belongings left in departmental facilities may be discarded.

Phones

Phones are provided in several laboratory rooms. Students should not routinely make or receive calls at the lab.

Labeling

All biohazards, work areas, storage cabinets, and equipment involved in processing regulated biohazards must be labeled with the universal biohazard symbol:



Biosafety level - Laboratories are assigned a classification (Levels 1 to 4) based on the risk to human health of handling certain types of organisms. Level 1 laboratories are designed for low-risk work; Level 4 laboratories can handle organisms that pose the most serious risks. Laboratories at each classification level must meet different design criteria and conform to different operating procedures. Daemen College is not authorized to work with biohazards classified above level 2.

1. Regulated biohazards at BL-2 or above are labeled with a universal biohazard symbol similar to the one above. Additionally, they are labeled with the appropriate containment level symbol (BL-2, etc.), the identity of the infectious agent(s), the name and telephone number of the person to contact in case of incident, and an "AUTHORIZED PERSONNEL ONLY" sign. (**See Appendix 3 for definitions of Biohazard Safety Levels 1 & 2.**)
2. All biohazardous waste receptacles must be labeled.
3. All secondary containers of biohazardous material samples will be labeled with, a. the name of the infectious agent(s), b. the universal biohazard symbol, and c. the name of the person responsible.

Accidents

Laboratory Spills

Despite precautions, accidental spills can be expected to occur in the laboratory. When infectious materials are involved, it is important that the area be immediately isolated to prevent spread of the spillage.

All spills shall be immediately contained and cleaned up by appropriate professional staff or others properly trained and equipped to work with potentially concentrated infectious materials.

A spill or accident that results in an exposure incident shall be immediately reported to the laboratory director or other responsible person.

All major spills involving infectious materials must be reported to the Chemical Hygiene Officer and Campus Security.

Deliveries

Orders with special handling requirements (e.g. special packing or temperature requirements) upon delivery, should be noted on the purchase order and the departmental secretary in DS 211 should be informed prior to the delivery.

IV. SPECIFIC HAZARDS & DEFINITIONS

The following are potential biohazards and definitions applicable to Daemen's biological laboratories and research. These definitions are from Occupational Safety and Health Standards Subpart Z (Toxic and Hazardous Substances Standard Number 1910.1030): Bloodborne pathogens (Appendix A)

Blood means human blood, human blood components, and products made from human blood.

Bloodborne Pathogens means pathogenic microorganisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, hepatitis B virus (HBV) and human immunodeficiency virus (HIV).

Contaminated means the presence or the reasonably anticipated presence of blood or other potentially infectious materials on an item or surface.

Contaminated Laundry means laundry which has been soiled with blood or other potentially infectious materials or may contain sharps.

Contaminated Sharps means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

HBV means hepatitis B virus.

HIV means human immunodeficiency virus.

Other Potentially Infectious Materials means (1) The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids; (2) Any unfixed tissue or organ (other than intact skin) from a human (living or dead); and (3) HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs, or other tissues from experimental animals infected with HIV or HBV.

Regulated Waste means liquid or semi-liquid blood or other potentially infectious materials; contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed; items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling; contaminated sharps; and pathological and microbiological wastes containing blood or other potentially infectious materials.

Source Individual means any individual, living or dead, whose blood or other potentially infectious materials may be a source of occupational exposure to the employee. Examples include, but are not limited to, hospital and clinic patients; clients in institutions for the developmentally disabled; trauma victims; clients of drug and alcohol treatment facilities; residents of hospices and nursing homes; human remains; and individuals who donate or sell blood or blood components.

Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and other bloodborne pathogens.

V. BIOHAZARDOUS WASTE

Physically dangerous waste and sharps waste is defined as discarded items that may cause punctures or cuts to include: hypodermic needles/syringes, Pasteur pipettes, scalpel blades, and disposable razors. Glass will be disposed of in appropriate glass boxes. Control and disposal of sharps must comply with the following requirements:

1. Sharps must be segregated from other wastes and disposed of in leakproof, rigid, puncture resistant, shatterproof containers. These containers are supplied by your departments.
1. Place all other biohazardous waste into designated biohazardous waste bags inside labeled biohazardous waste boxes.
2. The sharps must be rendered non-infectious by autoclaving, chemical disinfection or incineration.
3. All sharps containers must be labeled with a tag stating the date, principal investigator, lab room number, treatment status and who the treatment was performed by.
4. Sharps containers will be picked up on an as needed basis when boxes are full. Please contact the Health Services Office to arrange pick up. DO NOT dispose of physically hazardous waste in the regular trash.
5. Broken glass must be autoclaved or otherwise sterilized before being discarded in broken glass containers provided by your department
6. In case of leaking or damaged packaging of this material, call the Center for Disease Control at 1(800)232-0124.

VI. EMERGENCIES

Procedures

In the event an emergency should arise, the following procedures should be followed:

- If it is of a serious nature that requires police, rescue squad and/or ambulance, dial 911 immediately.
- Always call Security at **x8246**. Give them the precise location and the name of the individual(s) involved. Security will assist medical authorities in finding their way around campus. **It is imperative that Security is alerted to any emergency.**
- If the emergency involves a student, Security will alert the Student Affairs office, as well as Susan Girard, Health Services Coordinator, so she can assist the emergency team by providing pertinent information (e.g., allergies to medications) in the event the student cannot speak for him/herself. Only essential information will be released. Confidentiality of health records is safeguarded at all times.
- In our efforts to maintain confidentiality, individuals should remove themselves from the immediate emergency area once assistance has arrived. This will not only give better access to rescue personnel, it will help ensure that confidential information is not overheard beyond those individuals who need to know. Individuals may be asked to complete an accident/incident report for Security.
- Family Care Medical Center, located at 61 Maple Rd. in Williamsville (565-1234) is the primary health care provider (non-emergency situations) for Daemen College students enrolled in the Daemen College Student Health Insurance Program. Family Care will provide health care to any Daemen student and will work with other insurance carriers. Family Care has agreed to give priority appointments to our students, but they do ask our cooperation in calling their office first to avert scheduling conflicts. Walk-in hours are available 8 a.m. -11a.m. on Saturdays.

Fire Alarms

Daemen College is required to conduct three announced fire drills each year. Please respond to all alarms as if they are real. You should always exit the laboratory, using the closest exit. In the event of an emergency, please pull the alarm nearest to the source of the emergency. Security will respond to the site of the pulled alarm and will notify the fire department and direct them to the emergency alarm and will notify the fire department and direct them to the emergency site if needed. The fire department will answer all calls and will respond to the site of the pulled alarm.

Medical Emergencies

In medical emergencies, administer first aid, CPR, etc. as appropriate. You should also call security. Please explain the type of problem and the type of help requested. Daemen security will be able to request additional emergency medical personnel.

APPENDIX 1

Daemen Staff Special Responsibilities

Natural Sciences Department Chair: Dr. Diane Ramos

Chemical Safety Officer: Mr. Derrick Swartz

Director of Natural and Health Sciences Research Center: Dr. Laura Edsberg

Director of Physical Plant Maintenance and Safety Officer: Mr. Don Phillips

APPENDIX 2

Federal Regulations: Websites

OSHA Occupational Safety and Health Administration/DOL
<http://www.osha.gov>

Chemical Hygiene (Lab)
http://www.osha-slc.gov/OshStd_data/1910_1450.html

Bloodborne Pathogens
http://www.osha-slc.gov/OshStd_data/1910_1030.html

Personal Protective Equipment
http://www.osha-slc.gov/OshStd_toc/OSHA_Std_toc_1910_SUBPART_I.html

Formaldehyde
http://www.osha-slc.gov/OshStd_data/1910_1048.html

National Institute for Occupational Safety and Health/HHS
<http://www.cdc.gov/niosh/homepage.html>

Centers for Disease Control and Prevention/HHS
<http://www.cdc.gov/>

Office of Safety and Health
<http://www.cdc.gov/od/ohs/>

"Biosafety in Microbiological and Biomedical Laboratories" (CDC/NIH Manual)
<http://www.cdc.gov/od/ohs/biosfty/bmbl/bmbl-1.htm>

Explanation of Different Types of Biosafety Cabinets (BSC)
<http://www.cdc.gov/od/ohs/biosfty/bmbl/appendix.htm#AppendixA>

Packaging of Infectious Materials
<http://www.cdc.gov/od/ohs/biosfty/bmbl/appendix.htm#AppendixD>

Health & Safety Manuals
<http://www.cdc.gov/od/ohs/manual/manual.htm>

U.S. Department of Health and Human Services
<http://www.os.dhhs.gov>

**APPENDIX 3: Table 3 A (from CDC Laboratory Information:
<http://www.bt.cdc.gov/labissues/#biosafety>)**

See attached table.