

Biosafety

Course Outcome Summary

Course Information

Organization	Madison Area Technical College
Developers	Lisa Seidman, Ph.D.
Development Date	2/12/2003
Course Number	10-007-109
Instructional Level	Associate Degree
Potential Hours of Instruction	72
Total Credits	1

Description

Surveys potential hazards and safety procedures associated with biohazards including lab animals and pathogens. Lab included. CrLf

Types of Instruction

Instruction Type	Contact Hours	Credits
Classroom Presentation	36	1
On Campus Laboratory and Clinicals	36	

Textbooks

Biosafety in the Laboratory: Prudent Practices for Handling. National Research Council.
Joseph Accrocco and Michael Cinquanti. *Right to Know Pocket Guide for Laboratory Employees.*
University of Wisconsin Safety Department. *Radiation Safety for Radiation Workers.*

Learner Supplies

Lab coat.
Safety goggles.
Lab notebook.
Calculator with scientific notation.

Competencies

Unit 1. Introduction to Biological Hazards

A. Explore risk and responsibility

You will demonstrate your competence:

- A.1. through the completion of written assignments
- A.2. through written examinations

Your performance will be successful when:

- A.1. you compare the risk of infection to the severity of disease

- A.2. you identify occupations that are at risk of infection from laboratory organisms
- A.3. you explain who is responsible for laboratory biosafety

B. Examine the major aspects concerning infectious agents

You will demonstrate your competence:

- B.1. through the completion of written assignments
- B.2. through written examinations

Your performance will be successful when:

- B.1. you explore the major types of pathogens
- B.2. you explain the major routes of exposure to pathogens in lab situations
- B.3. you explore the factors that determine severity of infection

C. Investigate the aspects of occupational infections of lab workers

You will demonstrate your competence:

- C.1. through the completion of written assignments
- C.2. through written examinations

Your performance will be successful when:

- C.1. you define epidemiology
- C.2. you explore the components of the epidemiologic triad: the host, the infectious agent, and the environment
- C.3. you investigate the infectious agents presenting the highest and the lowest risk

Unit 2. Safe Handling of Infectious Agents

A. Explore the prevention of exposure to infectious agents

You will demonstrate your competence:

- A.1. through the completion of written assignments
- A.2. through written examinations

Your performance will be successful when:

- A.1. you explore the basic strategies involved in the safe handling of infectious agents
- A.2. you explore the seven basic rules of biosafety as outlined in textbook
- A.3. you explain the importance of labeling
- A.4. you define Standard Operating Procedure (SOP)

B. Explore the requirements for packaging, shipping and handling of biological specimens

You will demonstrate your competence:

- B.1. through the completion of written assignments
- B.2. through written examinations

Your performance will be successful when:

- B.1. you explore the rules for containment packaging and hazard warning labeling
- B.2. you explore a safe package inspection protocol and emergency plans

C. Examine the prevention of aerosol and droplet generation

You will demonstrate your competence:

- C.1. through the completion of written assignments
- C.2. through written examinations

Your performance will be successful when:

- C.1. you differentiate between contrast aerosols and droplets
- C.2. you summarize the lab operations having a high potential for aerosol production
- C.3. you examine the procedure and equipment that are designed to minimize aerosol

production

D. Demonstrate and analyze the production of aeros

You will demonstrate your competence:

D.1. through the completion of laboratory activities

D.2. through the completion of written explanation of results and observations of laboratory activities

Your performance will be successful when:

D.1. you simulate the production of aerosol in the laboratory with non-toxic fluorescent dyes and a hand pipetting device

D.2. you analyze the aerosol produced with each type of pipetting technique and show the best method for minimizing aerosol production

E. Explore the design and use of containment equipment in the labs

You will demonstrate your competence:

E.1. through the completion of written assignments

E.2. through written examinations

Your performance will be successful when:

E.1. you explain the primary objectives of containment

E.2. you define HEPA filter, laminar flow, and biological safety cabinet

E.3. you compare the characteristics of the three classes of biological safety cabinets

E.4. you explore personal protection attire

E.5. you differentiate between primary barriers (safety equipment) and secondary barriers (facility design)

F. Investigate laboratory biosafety level criteria

You will demonstrate your competence:

F.1. through the completion of written assignments

F.2. through written examinations

Your performance will be successful when:

F.1. you explore the function and characteristics of the basic, containment and maximum containment laboratory facilities

F.2. you summarize the basic characteristics of each of the four biosafety levels for infectious agents

F.3. you investigate the organisms for each biosafety level

F.4. you explain the biosafety levels designed for activities involving infectious agents and experimental vertebrate animals

Unit 3. Safe Disposal of Infectious Waste

A. Explore the infectious potential of laboratory waste

You will demonstrate your competence:

A.1. through the completion of written assignments

A.2. through written examinations

Your performance will be successful when:

A.1. you summarize the essential factors for lab waste to cause infection

A.2. you explain the occupational and public health risks of infectious lab waste

A.3. you explore the basic characteristics of infectious lab waste

A.4. you explain personal responsibility for safe handling and disposal of infectious waste

B. Explore waste handling methods

You will demonstrate your competence:

- B.1. through the completion of written assignments
- B.2. through written examinations

Your performance will be successful when:

- B.1. you explore containment and personal protection

C. Summarize sterilization and containment methods

You will demonstrate your competence:

- C.1. through the completion of written assignments
- C.2. through written examinations

Your performance will be successful when:

- C.1. you summarize decontamination
- C.2. you summarize autoclaving
- C.3. you summarize incineration
- C.4. you identify correct sterilization method for each type of potentially contaminated item

D. Demonstrate effectiveness of various decontamination methods

You will demonstrate your competence:

- D.1. through the completion of laboratory activities
- D.2. through the completion of written explanations of results and observations of laboratory activities

Your performance will be successful when:

- D.1. you demonstrate decontamination of a simulated spill
- D.2. you sterilize test strip using autoclave
- D.3. you compare the viability of E coli after various decontamination treatments

Unit 4. Safety Management

A. Explore the administrative organization and responsibilities relating to safety management

You will demonstrate your competence:

- A.1. through the completion of written assignments
- A.2. through written examinations

Your performance will be successful when:

- A.1. you explore agencies responsible for oversight of safety programs
- A.2. you summarize the provisions of the Community Right to Know Standard
- A.3. you explore the components of a Laboratory Safety Program

B. Explore the components of a laboratory emergency plan

You will demonstrate your competence:

- B.1. through the completion of written assignments
- B.2. through written examinations

Your performance will be successful when:

- B.1. you explore general emergency procedures including those for spills and releases
- B.2. you explore the general guidelines for evacuation procedures