

434/634 Biological Safety

(Listed under M&I, BIO, ANT, EES 460 and BMS 817)

CREDIT HOURS	2.0	DAY	Monday and Wednesday
LOCATION	Room 306 Oelman Hall	TIME	1:30 p.m. to 2:20 p.m.
INSTRUCTOR	Dawn P. Wooley, Ph.D. Room 016 Math & Micro Bldg. Phone: 775-4993; Fax: 775-3391 E-mail: dawn.wooley@wright.edu	OFFICE HOURS	2:20 p.m. to 3:20 p.m. on Wednesdays and also by appointment

COURSE DESCRIPTION

The basic principles and practices of biosafety are examined. This course teaches the identification, handling, and containment of potentially hazardous biological materials, including microorganisms and recombinant DNA.

GOALS

This course is designed for students, staff, and faculty who are working with or around potentially biohazardous materials in research laboratories. Persons who supervise biosafety staff members or who seek additional knowledge as a component to their job duty may also benefit from this course.

TEXTS

Fleming, D. O. and D. L. Hunt (eds.). 2006. *Biological Safety: Principles and Practices*, 4th ed. ASM Press, Washington, D.C.

Centers for Disease Control and Prevention and National Institutes of Health (CDC/NIH). 2007. *Biosafety in Microbiological and Biomedical Laboratories*, 5th ed. L. C. Chosewood and D. E. Wilson (ed.). U.S. Government Printing Office, Washington, D.C. Available free at <http://www.cdc.gov/OD/ohs/biosfty/bmbl5/bmbl5toc.htm>.

PERFORMANCE OBJECTIVES

The purpose of the course is to provide a foundation for the basic principles and practices of biosafety. At the conclusion of this course, the student will be able to:

- Identify potentially hazardous biological materials
- Recognize the risks associated with the use of hazardous biological materials
- Understand methods to minimize risk and to protect against release or exposure
- Provide effective technical expertise in situations involving potentially hazardous biological materials
- Explain the four levels of containment used in work places
- Identify, locate, and efficiently use key biosafety resources

GRADING POLICY

Award of letter grades, at course completion, reflecting the level of achievement of the course's performance objective is based on the scale:

A	B	C	D	F
100-90.00%	89.99-80.00%	79.99-70.00%	69.99-60.00%	<60.00%

Achievement is demonstrated through performance on the following measurement and learning devices:

Midterm Exam 30% Final Exam 40% Exercises 20% Attendance 10%

COURSE SCHEDULE

The class will meet twice each week for the quarter.

WEEK 1: RISK ASSESSMENT (SEPT. 9 & 14)

Definition • Risk Groups • Host & Environmental Factors • Lab Acquired Infections
Chapters 1, 4, and 5; BMBL Sections I, II, and VIII

WEEK 2: MICROBIOLOGY (SEPT. 16 & 21)

Microorganisms • Toxins • Mechanisms of Pathogenicity
Chapters 6, 7, 8, 9, and 13; BMBL Section VIII and Appendix I

WEEK 3: MOLECULAR BIOLOGY (SEPT. 23 & 28)

Gene Expression • Recombinant Gene Transfer Vectors • Viral Vector Systems
Chapter 28 and <http://www4.od.nih.gov/oba/rac/guidelines/guidelines.html>

WEEK 4: HUMAN SOURCE MATERIALS / CELL LINES (SEPT. 30 & OCT. 5)

Materials of Human Origin • Blood Borne Pathogens • Mammalian Cell Cultures
Chapters 11 & 18; BMBL Appendix H; See also:
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051

WEEK 5: DISINFECTION (OCT. 7) / MIDTERM (OCT. 12)

Classes of Disinfectants • Methods of Decontamination • MIDTERM
Chapter 20

WEEK 6: FACILITIES & EQUIPMENT / BIOLOGICAL SAFETY CABINETS (BSCs) (OCT. 14 & 19)

Engineering Controls • Biocontainment Facilities • Overview of BSCs
Chapters 14 & 16; BMBL Section IV and Appendix A

WEEK 7: MORE ON BSCs / ANIMALS & ALLERGENS (OCT. 21 & 26)

How BSCs Work and How They Are Tested • ABSLs & Animal Containment • Allergies
Chapters 2 and 12; BMBL Section V and Appendix D

WEEK 8: BIOLOGICAL WASTE / BIOSAFETY PRACTICES (OCT. 28 & NOV 2)

Infectious Waste Management • BSL-1 to BSL-3 practices • Safe Use of Lab Equip

Chapters 15 and 19; BMBL Section III

WEEK 9: PERSONAL PROTECTIVE EQUIPMENT (NOV. 4 & NOV. 9)

Personal Protective Equip. (PPE)

Chapter 17

WEEK 10: SHIPPING & TRANSPORTATION / MANAGEMENT & COMMUNICATION (NOV. 11)

Regulatory Issues • Basic Requirements • Practicing Biosafety in the Workplace

Chapters 21 and 22-25; BMBL Appendix C

FINAL EXAM: MONDAY, NOVEMBER 16, 1:00 P.M. TO 3:00 P.M.

LIST OF EXERCISES

Microbiology

Molecular Biology

Human Materials & Cell Lines

Disinfection & Biological Waste

Facilities & Equipment

Practices and PPE

Gloving

Emergency Response

Biosecurity

Shipping and Transportation

GRADUATE STUDENTS ONLY:

Application for use of biohazardous material:

http://www.wright.edu/rsp/IBC/IBC_Petition.doc

DAWN P. WOOLEY, PhD, SM(NRCM), RBP, CBSP