Class Times: Theoretical class offered every 3rd Friday of the month 8:30am – 12:30pm

Location: EHS, Material Management Building (see schedule)

Prerequisites: None

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Course Description: This course will offer students an in-depth understanding of biosafety principles, practices and techniques that are necessary to successfully conduct research in an ABSL3 laboratory. Topics will include: Animal Biosafety Levels, Personal Protective Equipment (PPE), Proper Use and Selection of Biological Safety Cabinets (BSCs), Aerosol Producing Procedures, Biological Exposures, Transport of Animals and Biological Materials, Disinfection, Waste Handling, Emergency Laboratory Procedures, Animal Handling, Dosing, Sampling, Euthanasia, and Necropsy Procedures. Emphasis will be on development of competencies in fundamental laboratory techniques and using risk assessment to work safely and aseptically in the laboratory.

Course Objective: The principal objective of this course is to develop students’ techniques with proper practices for ABSL3 laboratory work. At the completion of this course students will be able to demonstrate appropriate associated safety techniques and proper animal handling techniques along with safe use of PPE and BSCs.

Registration Form: Complete the ABSL3 registration form (http://www.utmb.edu/BOF/BC/forms.asp) and return to the Course Coordinator.
Text & Materials: Biosafety in Microbiological and Biomedical Laboratories (BMBL, available online), Animal Biosafety Training Program Textbook, internal to EHS at UTMB (provided to students), and supplemental readings.

Grading: The course is graded Satisfactory/Unsatisfactory. Attendance and participation are required. Students must pass both components of the course to receive a passing (S) grade. Opportunities for remediation of laboratory skill proficiencies will be available to those who need them.

Course Outline:

Theoretical class 4Hrs

Unit 1: Biosafety Containment Levels
Objectives-Learners will:
- categorize ABSL 1-2 labs based on primary and secondary barriers based on BMBL guidelines
- compare risk group vs. biosafety level

Unit 2: Principles of Personal Protective Equipment (PPE)
Objectives-Learners will:
- compare advantages and disadvantages of types of PPE
- explain the use of PPE for certain applications based on risk assessment
- correctly don and doff PPE

Unit 3: Principles of Biosafety Cabinets
Objectives- Learners will:
- identify different types of Biosafety cabinets
- differentiate between Biosafety Cabinets (BSC)
- recognize techniques for proper use of the BSC for certain applications
- compare airflow patterns of BSCs
- evaluate risks associated with improper use of BSCs with agents of varying risk factors
- name the 3 types of protection offered by a BSC
- name the 3 types instances that require BSC certification

Unit 4: Risks involved with Aerosol Producing Procedures
Objectives-Learners will:
- recognize factors associated with aerosol production
- describe common procedures that produce aerosols in the laboratory
- recognize laboratory equipment and animal manipulations that produce aerosols
- evaluate the risks associated with working with infectious materials and laboratory equipment that potentially produce aerosols
Unit 5: Risks Associated with Biological Exposures
Objectives-Learners will:
- identify potential biological exposures
- explain how to respond and report a biological exposure

Unit 6: Transportation of Animals and Biological Materials (infectious & noninfectious)
Objectives- Learners will:
- describe proper procedure for transporting animals within the animal facility vs. to research laboratory
- identify agencies that regulate transport of biological materials
- compare procedures for transporting biological materials in the lab vs. across campus vs. off campus

Unit 7: Emergency Procedures
Objectives- Learners will:
- evaluate response to spills in different locations in the laboratory
- recognize emergency response procedures specific to UTMB for laboratories
- describe response procedure for escaped animals

Unit 8: Principles of Disinfection
Objectives-Learners will:
- identify disinfectants utilized in the animal facility
- demonstrate knowledge of appropriate techniques for proper disinfection of BSCs, caging, and waste
- recognize how to properly dispose of biological waste in the laboratory

Unit 9: Autoclaves
Objectives-Learners will:
- identify 3 ways of verification of an autoclave run
- identify the personnel responsible for laboratory autoclaves
- describe emergency response procedures specific to UTMB for autoclave malfunctions

Unit 10: General Laboratory and Personnel Practices
Objectives-Learners will:
- demonstrate knowledge of proper practices while working in the animal facilities
- demonstrate knowledge of proper disposal of sharps

Unit 11: Responsibilities and Recordkeeping Practices
Objectives-Learners will:
- explain importance of reading and understanding an animal use protocol and notice of use (NOU)
• explain importance of proper record keeping for animal records and research records

Unit 12: Basic Animal Handling and Techniques
Objectives-Learners will:
• describe different methods of animal handling including manual and chemical restraint

Unit 13: Dosing and Sampling Techniques
Objectives-Learners will:
• describe basic routes of dosing animals.
• describe basic methods/routes of sample collection

Unit 14: Principles of Euthanasia
Objectives-Learners will:
• explain importance of knowing approved methods of euthanasia
• describe methods of proper euthanasia including primary and secondary methods

Unit 15: Necropsy
Objectives-Learners will:
• explain the potential for biological exposures while performing a necropsy
• describe most dangerous organ to remove during a necropsy

Practical training (8hrs) - Protocol specific

Unit 1: Proper techniques and animal cage handling in a BSC with ABSL3 PPE
Unit 2: Proper animal handling, dosing, and sample collections in a BSC with ABSL3 PPE
Unit 3: Proper animal handling, dosing, and sample collections in a BSC and emergency procedures with ABSL3 PPE
Unit 4: Hands on check-out on proper techniques, animal handling, dosing/sample collection while working in a BSC with ABSL3 PPE

ASSIGNMENTS Pre- and Post-Course

LABORATORY PRACTICAL
2 hour sessions; times assigned by instructor

FINAL EXAM
1.5-Hour Exam