VS106

Laboratory Procedures I

3 Credits

Instructor: Brianne Bellwood
780 853 8788

Original Developer: Brianne Bellwood

Current Developer: Brianne Bellwood

Reviewer: Dr. Robyn Rodgers

Created: 07/01/2014

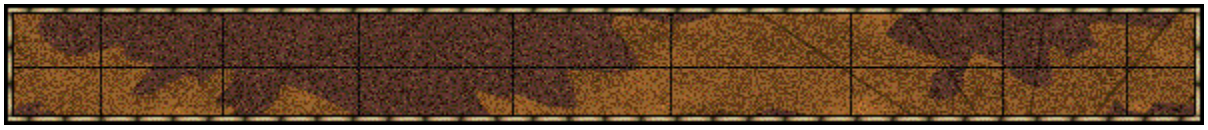
Revised: 09/12/2020

Approval: 16/12/2020

The Implementation Date for this Outline is 05/01/2021

Copyright©LAKELAND COLLEGE. E-mail: admissions@lakelandcollege.ca
2602 - 59 Avenue, Lloydminster, Alberta, CanadaT9V 3N7. Ph: 780.871. 5700
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780.853.8400
Toll-free in Canada: 1 800 661 6490

VS106 Version: 7



Laboratory Procedures I

Calendar Description

In this course a variety of laboratory subjects are covered including hematology, urinalysis, clinical chemistry and microbiology. Students are introduced to the different laboratory techniques used and the theory necessary to understand and interpret them.

Rationale

This is a required course for students in the Animal Health Technology program. It introduces the common laboratory procedures performed by an RVT that will aid a Veterinarian in diagnosing various diseases and condition. A good understanding of the procedures covered is valuable for future success as a Registered Veterinary Technologist.

Prerequisites

VS101, VS103, and VS104

Co-Requisites

None

Course Learning Outcomes

Upon successful completion of this course, students will be able to

Quality Assurance and Quality Control

1. explain the significance of practicing effective quality assurance and quality control when performing laboratory tests.
2. develop QA and QC protocols for common laboratory procedures.

Hematology

1. list and describe the physiological process of hematopoiesis in mammals.
2. explain how blood samples are prepared for evaluation and list the equipment and supplies that are required.
3. describe the morphology and function of mammalian blood cells.

4. demonstrate knowledge of the erythrocytes including the formation or, disposal of, and the normal and abnormal findings in mammals.
5. describe the process of coagulation.

Urinalysis

1. describe the process of performing a physical, chemical and microscopic urinalysis.
2. explain the causes and significance of abnormal findings in a routine urinalysis.
3. explain the significance of proteinuria and list common available testing methods to detect its presence.
4. describe the process of performing a urine cytology examination.

Microbiology

1. describe the morphology and anatomy of various microorganisms such as bacteria, fungi and viruses.
2. identify equipment, supplies and procedures used in the identification of microorganisms.
3. list common bacterial pathogens encountered in Veterinary Medicine.
4. describe the differences between bacteria, viruses, fungi and prions.

Parasitology

1. describe and perform collection and handling techniques of samples.
2. describe and perform the various diagnostic techniques used in veterinary parasitology.
3. identify and describe the life cycles of parasitic nematodes, cestodes and trematodes of canine, feline, ruminant and equine species.

Laboratory Objectives

1. demonstrate entry-level skills in performing common laboratory tests in the areas of
    a. Hematology
    b. Urinalysis
    c. Microbiology
    d. Parasitology
2. practice safe laboratory protocols when performing tests and using laboratory equipment.
3. develop and follow Standard Operating Procedures (SOPs) for routine laboratory tests
4. demonstrate a high-level of quality control and quality assurance when performing laboratory procedures.
5. describe and demonstrate the correct usage, maintenance and quality control methods of automated hematology.
6. describe and demonstrate the correct usage, maintenance and quality control methods of automated urinalysis.

Resource Materials

***Required Textbooks and Materials*:**

1. Sirois, M. (2020). *Laboratory procedures for Veterinary Technicians* (7th ed.) St. Louis, MO: Elsevier Mosby.
2. Bellwood, B., & Andrasik-Catton, M. (2014). *Veterinary Technician's handbook of laboratory procedures.* Ames, Iowa: Wiley.
3. Microscopy Learning Systems (MLS), https://store.mlsedu.com/

***Recommended Textbooks*:**

1. Hendrix, C. M. (2017). *Diagnostic Parasitology for Veterinary Technicians* (5th ed.) St. Louis, MO: Elsevier Mosby.
2. Keohane, E. M. (2020). *Rodak's Hematology* (6th ed.) St. Louis, MO: Elsevier Mosby.

**Assigned readings and testing questions are a part of this course. Access to the resource materials is essential to the student's success.

Conduct of Course

This course consists of 42 lecture hours and 42 lab hours. Classroom instruction includes lectures and videos.

The lecture portion of the course covers the theory necessary to understand and perform the lab portion. Proper terminology and definitions is taught during lecture time and these are reinforced during labs. The Lab portion allows individual interaction with instructor/student and more practical work for each student. STUDENTS ARE EXPECTED TO HAVE A LAB COAT or SCRUB TOP BY THE FIRST LABORATORY PERIOD.

Missing a laboratory without an excused absence results in a grade of zero for that specific lab portion. Excused absence from laboratory activities and assignments may be completed at a later date at the discretion of the instructor. Due to scheduling conflicts, limited space and sample availability, a make-up lab may not always be possible.

Students are expected to follow Lakeland College's Laboratory Policy at all times. **Failure to do so results in the student no longer being able to participate in the lab.**

Students are required to have valid Lakeland College WHMIS certification to participate in this course.

Evaluation Procedures

LECTURE	
Quizzes & Assignments	17.5%
Midterm	15%
Final	17.5%
LABORATORY	
Lab assignments & quizzes	32%
Lab Final Exam	18%
TOTAL	100%

The instructor reserves the ability to hold pop quizzes throughout the semester with no prior notification.

**Successful completion of all assigned course competencies is a requirement for passing the course. Evaluation of competencies is based on the student's ability to independently complete the procedure correctly, accurately and within a specified period of time. Competencies are scored on a pass/fail basis.*

Missed Exams:

If, for any reason, a student is unable to write one of the scheduled exams, the weight of that exam is transferred to the Final Exam as long as the instructor is given at least one week notice prior to the exam. This is policy is also applied to exams missed due to illness as long as a doctor's note is provided. A "make-up" exam will not be arranged.

Grade Equivalents and Course Pass Requirements

Letter	F	D	D+	C-	C	C+	B-	B	B+	A-	A	A+
Percent Range	0-49	50-52	53-56	57-59	60-64	65-69	70-74	75-79	80-84	85-89	90-94	95-100
Points	0.00	1.00	1.30	1.70	2.00	2.30	2.70	3.00	3.30	3.70	4.00	4.0

Students must successfully pass or complete the lecture portion of the course with a 60% (C), and the lab portion with a 70% (B-). A mark in the lecture portion of 50-59% is recorded as a 'D'. A mark of 50-69% in the lab portion is recorded as a 'D'.

A grade of C (60%) in the lecture, a B- (70%) in the lab portion, plus successful completion of all required competencies is required in this course to progress to VS203 Laboratory Procedures II.

Attendance

Classroom and laboratory attendance is considered vital to the learning process and as significant to the students' evaluation as examinations and reports.

a. Students having a combination of excused and/or unexcused absence of 20 percent or higher for the scheduled course hours will be required to withdraw and will automatically receive a "RW" (required withdrawal) for the course, regardless of any other evaluation results. (RW is a failing grade.).
b. An excused absence is one that is verified with your Instructor. Verification should be prior to the absence or the next class day following the absence. Verification of the absence may take the form of a note from your doctor/College nurse regarding illness, or a note from another Instructor regarding a field trip or other activity, or authorization by your Instructor. An unexcused absence is anything NOT verified by the instructor prior to the absence or the next class day following the absence.

NOTE: Any exceptions to the above attendance policy (e.g. timetable conflicts, work-related issues) must be approved in writing by the Department Chair prior to the beginning of the course.

It is the students' responsibility to know their own absentee record.
Normal hours are 8:30 a.m. to 6:30 p.m., with potential for evening courses, exams or extended field trips. Students are expected to be available for classes during these times, either in person or online.

Course Units/Topics

Lecture (42 hours)

1. Quality Assurance and Quality Control
   a. QA vs QC
   b. Accuracy and Precision
   c. Pre-analytic, analytic, & post analytic variables

2. Hematology
   a. Sample handling
   b. Erythrocytes & Anemia
   c. Leukocytes
   d. Thrombocytes & Hemostasis

3. Parasitology
   a. Diagnostic Techniques
   b. Nematodes
   c. Cestodes
   d. Trematodes

4. Urinalysis
    a. Sample handling and preservation
    b. Physical examination
    c. Chemical examination
    d. Sediment examination

5. Microbiology
    a. Nomenclature
    b. Bacterial cell morphology and function
    c. Equipment and supplies
    d. Species identification tests
    e. Viruses
    f. Mycology
    g. Pathogens of Veterinary Importance

Laboratory (42 hours)

1. Hematology & Microscopy
    a. Microscope care and operation
    b. Laboratory math
    c. Blood smear preparation
    d. Packed Cell Volume and Total Protein
    e. WBC differential counts
    f. Total WBC counts
    g. Estimates
    h. Morphologies
    i. RBC Indices

2. Parasitology
    a. Sample Collection and Preparation
    b. Direct smear
    c. Simple Flotation
    d. Centrifugal Flotation
    e. Sedimentation & Baermann Technique
    f. Ova Identification

3. Urinalysis
    a. Physical exam
    b. Chemical exam
    c. Sediment exam
    d. Dry slide examination
    e. Automated Urinalysis

4. Microbiology
    a. Gram staining
    b. Pathogen identification
    c. Bacterial culture
    d. Antibiotic sensitivity tests
    e. Dermatophyte examination
    f. Ear cytology

Copyright©LAKELAND COLLEGE.
2602 - 59 Avenue, Lloydminster, Alberta, Canada T9V 3N7. Ph: 780 871 5700
5707 College Drive, Vermilion, Alberta, Canada T9X 1K5. Ph: 780 853 8400
Toll-free in Canada: 1 800 661 6490. E-mail: admissions@lakelandcollege.ca