

**STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK**



COURSE OUTLINE

VSCT 112 – VETERINARY CLINICAL PATHOLOGY I

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**SCHOOL OF SCIENCE, HEALTH AND CRIMINAL JUSTICE
VETERINARY SCIENCE TECHNOLOGY
MAY 2015**

- A. **TITLE:** Veterinary Clinical Pathology I
- B. **COURSE NUMBER:** VSCT 112
- C. **CREDIT HOURS:** 3
- D. **WRITING INTENSIVE COURSE:** No
- E. **COURSE LENGTH:** 15 weeks
- F. **SEMESTER(S) OFFERED:** Spring
- G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
2 lecture hours and 2 laboratory hours per week
- H. **CATALOG DESCRIPTION:**
An introduction to Veterinary Clinical Pathology as it relates to normal and abnormal physiology of animal species. Emphasis will be placed on techniques and sample handling rather than diagnosis. This course includes instruction in general laboratory equipment and the proper preparation of biological samples. Students will learn basic diagnostic techniques that include complete blood count, urinalysis, and examination of feces for internal parasites. Enrollment limited to students in the veterinary technology programs (521 & 2278).
- I. **PRE-REQUISITES/CO-REQUISITES:**
a. Pre-requisites OR Co-requisites: VSCT 114 and VSCT 115
b. Co-requisite(s): none
- J. **GOALS (STUDENT LEARNING OUTCOMES):**
By the end of this course, the student will be able to:

<i>Course Objective</i>	<i>Institutional SLO</i>
a. Properly carry out analysis of canine hematology specimens, including CBC and microscopic exam of blood films.	2. Crit. Thinking 3. Prof. Competence
b. Discuss the constituents of the blood in regards to cellular components and their functions	1. Communication 3. Prof. Competence
c. Report results and explain basic reasons for abnormal hematology and clinical chemistry findings	1. Communication 3. Prof. Competence
d. Perform fecal examination for parasites and physical and chemical urinalysis.	3. Prof. Competence
e. Explain the use of clinical chemistry tests as a basis for determination of organ function.	1. Communication 2. Crit. Thinking 3. Prof. Competence

K. TEXTS:

Sirois, Laboratory Procedures for Veterinary Technicians Sixth Edition. St. Louis, Missouri: Elsevier, 2015.

Clinical Pathology Laboratory Manual.

L. REFERENCES:

Kaplan and Szabo, Clinical Chemistry Interpretations and Techniques, Lea and Febiger, Philadelphia, PA, 1979.

Coles, Embert H., Veterinary Clinical Pathology, Third Edition, W.B. Saunders Company, West Washington Square, Philadelphia, PA, 1980.

Schalm, Et Al, Veterinary Hematology, Third Edition, Lea and Febiger, Philadelphia, PA, 1975.

Schalm, O.W., Manual of Feline and Canine Hematology, Veterinary Practice Publishing Company, Santa Barbara, CA, 1980.

M. EQUIPMENT: white lab coat or scrub top is required in laboratory

N. GRADING METHOD: A-F

O. MEASUREMENT CRITERIA/METHODS:

- Exams
- Quizzes
- Laboratory Reports & Quizzes
- Laboratory Practicum

P. DETAILED COURSE OUTLINE:

I. Hematology

1. Define Hematology
2. Discuss advantages and disadvantages of commonly available anticoagulants (EDTA, Heparin, Citrate, Oxalate)
3. Discuss sample collection equipment, common venipuncture locations
4. Discuss techniques of patient preparation
5. Discuss and define blood components, both cellular and fluid

II. Complete Blood Count

A. PCV

- a. Explain procedure involved
- b. Discuss what information the test gives and normal canine values
- c. Draw and label the parts of a spun microhematocrit tube
- d. Define the terms hemolysis, icterus, and lipemia and explain how these states are identified
- e. Discuss reasons for abnormal values, both clinical reasons and technical errors

B. Blood Smear

- a. Explain procedure involved and characteristics of a good blood

- smear
 - b. Explain method of Dif-Quick Stain
 - c. Explain principles of the Romanowsky Staining Technique (Terms basophilic, eosinophilic, neutrophilic)
- C. White Blood Cell Count
- a. Explain procedure involved in the manual dilution method of WBC count
 - b. Discuss Hemacytometer and Neubauer Ruled Grid
 - c. Explain method of counting WBCs
 - d. Explain calculation for WBC count taking into account dilution and volume of hemacytometer
 - e. Discuss normal canine values
 - f. Explain reasons for abnormal values, both clinical reasons and technical errors
- D. Plasma Protein
- a. Explain procedure involved in refractometer method of plasma protein measurement
 - b. Discuss normal canine values
 - c. Explain reasons for abnormal values—clinical and technical
- E. Hemoglobin
- a. Discuss structure, function of hgb molecule
 - b. Explain spectrophotometric and hemoglobinometer method of hgb determination
 - c. Discuss normal canine values
 - d. Explain reasons for abnormal values both clinical and technical
- F. Differential White Blood Cell Count
- a. Discuss the five leukocytes in terms of:
 - 1. Appearance on a dif-quick stain
 - 2. Function in body
 - 3. Normal canine values
 - 4. Reasons for abnormal values
 - b. Explain band cells
 - c. Calculate absolute WBC values
 - d. Discuss thrombocyte appearance, their function, normal values, and reasons for abnormal values
 - e. Discuss estimated platelet count
 - f. Discuss normal canine morphology of RBC
 - g. Recognize and explain abnormal RBC morphology.
 - h. Calculate WBC count correction for presence of nucleated RBCs
- G. RBC indices
- a. Calculate RBC indices
 - b. Discuss normal canine values
 - c. Explain reasons and terminology for abnormal values

III. Clinical Chemistry

A. Clinical Enzymology

1. Define and discuss enzymology
2. Muscle
 - a. Discuss general principles of Creatine Kinase and clinical reasons for abnormal values
3. Liver
 - a. Discuss function of the liver
 - b. Discuss the testing of the following substances in regard to species used and clinical reasons for abnormal values
 - Bilirubin (VandenBergh rxn)
 - ALT
 - AST
 - SAP
 - GGT
 - SDH
 - LDH
 - Bile Acids
4. Exocrine Pancreas
 - a. Explain the diseases Pancreatitis and EPI
 - b. Discuss pancreatic enzymes: Amylase, Lipase, and Trypsin in regard to purpose of testing and clinical reasons for abnormal values
 - c. Explain Gelatin Digestion test for Trypsin
 - d. Determinations for Fecal fat and starch
 - e. Fat Absorption test
5. Kidney
 - a. Discuss reasons for pre-renal, renal, and post-renal disease
 - b. Explain the difference between Uremia and Azotemia
 - c. Explain the products BUN and Creatinine and discuss clinical reasons for abnormal values
6. Electrolytes and Acid Base Balance
 - a. Discuss purpose of common electrolytes in body (Na, Cl, K, Mg).
 - b. List common testing methods
 - c. Explain clinical reasons for abnormal values
 - d. Discuss purpose of blood buffer system
 - e. Explain pathways of Bicarb Carbonic Acid System
 - f. Discuss causes and effects of Acidosis and Alkalosis
 - g. List common testing methods
7. Pituitary and Adrenal Gland
 - a. Discuss function of pituitary and list hormones produced
 - b. Discuss physiology of adrenal gland
 - c. Discuss causes and signs associated with hyperadrenocorticism and hypo adrenocorticism
 - d. Discuss tests for adrenal pathology
 - Resting cortisol, ACTH stimulation, LD, and HD DST
8. Thyroid
 - a. Discuss normal physiology of the thyroid gland

- b. Explain causes and signs associated with hyperthyroidism and hypothyroidism
 - c. Discuss tests for thyroid pathology
-Resting T₃ and T₄; TSH Response Test
9. Parathyroid
- a. Discuss physiology
 - b. Explain causes and signs associated with hyperparathyroidism and hypoparathyroidism
 - c. Discuss Ca and Ph testing
10. Endocrine Pancreas
- a. Discuss physiology
 - b. Explain causes and signs of diabetes melitus and ketosis
 - c. Discuss glucose testing and glucose tolerance test

Q. LABORATORY OUTLINE:

- Lab 1 Introduction to Laboratory Procedures
- Lab 2 PCV and Blood Smear
- Lab 3 PCV, Blood Smear and WBC count
- Lab 4 PCV, Blood Smear, WBC count and Total Protein
- Lab 5 PCV, Total Protein and Differential WBC count
- Lab 6 Differential WBC count and RBC Count
- Lab 7 Differential WBC count and Hemoglobin
- Lab 8 Introduction to Parasitology
- Lab 9 Introduction to Urinalysis
- Lab 10 Ear Cytology
- Lab 11 CBC and Estimated Platelet Count and Indices
- Lab 12 Introduction to Serology
- Lab 13 Review
- Lab 14 Lab Practical Exam