

VEM5221 Veterinary Clinical Pathology

SEMESTER: FALL 2021

CREDIT HOURS: 4

GRADING SYSTEM: A-E GRADING

PHASE: II

Course Coordinator

Name: Sarah Beatty, DVM, Diplomate ACVP (Clinical)

Preferred Contact Method: [Course Canvas Message/Inbox](#)

Phone: 352-294-4031

Email: skbeatty@ufl.edu

Office Hours: By appointment, weekly office hours listed on Canvas

Course Description

This is an introductory course designed to provide basic knowledge about veterinary clinical pathology. The major goal of this course is for students be able to understand and use clinical pathology test results to diagnose and monitor animal diseases in clinical patients. Students will develop competency in interpreting laboratory results, including complete blood cell count, clinical serum biochemistry, urinalysis, hemostatic tests, and endocrine tests. Instructions for optimal laboratory sample collection and handling will be covered along with pathophysiology relevant to laboratory result interpretation.

Student Learning Outcomes

After successful completion of this course, students will be able to:

1. Restate and utilize optimal laboratory sample collection and submission and describe pathophysiology relevant to laboratory result interpretation.
2. Examine and assess clinicopathologic data from the seven major categories of testing (complete blood cell count, hemostatic tests, serum biochemistry, urinalysis, basic endocrine testing, basic exfoliative cytology, and body cavity fluid analyses) in order to diagnose and monitor disease of nearly all body systems.
3. Judge the clinical significance of the laboratory findings and construct a basic plan for future diagnostic tests, client communication, and potential treatments.

Keywords and Learning objectives for each topic are provided in each Canvas module.

Course Schedule

This weekly schedule contains topics, assignments, and exams. Please refer to Canvas for updates and announcements to any changes to this schedule.

Class lectures and discussion will be held in person and synchronously via Zoom and Laboratories will be held in V1-126 (Clinical Skills) unless otherwise specified.

DATE	TIME	PURPOSE	Module	TOPIC	Faculty	SLO	IUs
23-Aug	1:00 - 1:50	Intro Lecture 1	1	Intro to CP, Lab Principles/Methods	Beatty	1-3	1
23-Aug	2:00 - 2:50	Heme Lecture 1	2	Blood Film evaluation	Beatty	1-3	1
25-Aug	1:00 - 1:50	Heme Lecture 2	3	Evaluation of RBCs	Beatty	1-3	1
25-Aug	2:00 - 2:50	Heme Lecture 3	4	Anemia & Regenerative response	Beatty	1-3	1
26-Aug	1:00 - 1:50	Heme Lecture 4	5	Regeneration, RBC morph, inclusions	Beatty	1-3	1
26-Aug	2:00 - 2:50	Heme Lecture 5	6	Regenerative anemia & tests	Beatty	1-3	1
30-Aug	1:00 - 1:50	Heme Lecture 6	7	Non-regenerative anemia	Beatty	1-3	1
30-Aug	2:00 - 2:50	Heme Lecture 7	8	Non-reg anemia, erythrocytosis	Beatty	1-3	1
1-Sep	1:00 - 1:50	Heme Lecture 8	9	Platelet tests, Abnormal platelets	Beatty	1-3	1
1-Sep	2:00 - 2:50	Heme Lecture 9	10	Introduction to coagulation	Beatty	1-3	1
2-Sep	1:00 - 1:50	Heme Lecture 10	11	Coagulation testing	Beatty	1-3	1
2-Sep	2:00 - 2:50	Heme Lecture 11	12	Coagulation abnormalities	Beatty	1-3	1
7-Sep	8:00-9:50	Hematology Lab 1	13	Hematology Lab- A Group	Beatty	1-3	1
7-Sep	10:30-12:20	Hematology Lab 1	13	Hematology Lab- B Group	Beatty	1-3	1
9-Sep	8:30-10:20	Heme Discussion 1	14	RBC, Plt, Hemost/Coag discussion	Beatty	2-3	1
9-Sep	3:00 - 3:50	Exam 1 Review	15	RBC, Platelets, Hemost, Coag	Beatty	1-3	0.5
13-Sep	8:30-10:20	Exam 1		Exam-RBC, Platelets, Hemost, Coag	Beatty	1-3	1
14-Sep	8:30-9:20	Heme Lecture 12	16	WBC intro, WBC morph/function	Lanier	1-3	1
14-Sep	9:30-10:20	Heme Lecture 13	17	WBC distribution and kinetics	Lanier	1-3	1
15-Sep	8:30-9:20	Heme Lecture 14	18	Abn. WBC morphology and count	Lanier	1-3	1
15-Sep	9:30-10:20	Heme Lecture 15	19	Abnormal WBC count cont'd	Lanier	1-3	1
16-Sep	8:30-9:20	Heme Lecture 16	20	Introduction to bone marrow	Lanier	1-3	1
16-Sep	9:30-10:20	Heme Lecture 17	21	Bone marrow and WBC cancers	Lanier	1-3	1
17-Sep	8:30-10:20	Heme Discussion 2	22	WBC/Bone Marrow discussion	Lanier	2-3	1
20-Sep	1:00 - 1:50	Heme Lecture 18	23	Exotics Hematology	Alexander	1-3	1
20-Sep	2:00 - 2:50	Heme Discussion 3	23	Exotics Hematology	Alexander	2-3	0.5
21-Sep	8:00-9:50	Hematology Lab 2	24	Hematology Lab- B Group	Lanier	2-3	1
21-Sep	10:30-12:20	Hematology Lab 2		Hematology Lab- A Group	Lanier		
22-Sep	1:00-1:50	Exam 2 Review	25	WBC and bone marrow	Lanier	1-3	0.5
24-Sep	8:30-10:20	Exam 2		Exam WBC and bone marrow	Beatty	1-3	1
5-Oct	1:00 - 1:50	Chem Lecture 1	26	Intro to Clinical Chemistry, Analytics	Beatty	1-3	1
5-Oct	2:00 - 2:50	Chem Lecture 2	27	Evaluation of Proteins	Beatty	1-3	1

7-Oct	1:00 - 1:50	Urinalysis Lecture 1	28	Urinalysis collection & procedures	Beatty	1-3	1
7-Oct	2:00 - 2:50	Urinalysis Lecture 2	29	Urinalysis sediment & interpretation	Beatty	1-3	1
12-Oct	1:00 - 1:50	Chem Lecture 3	30	Renal System	Beatty	1-3	1
12-Oct	2:00 - 2:50	Chem Lecture 4	31	Renal System	Beatty	1-3	1
13-Oct	8:30-10:20	UA Discussion 1	32	UA Clinical Case Interpretation	Beatty	1-3	1
14-Oct	1:00 - 1:50	Chem Lecture 5	33	Calcium, Phosphorus, & Magnesium	Beatty	1-3	1
14-Oct	2:00 - 2:50	Chem Lecture 6	34	Water balance/Electrolytes	Beatty	1-3	1
14-Oct	3:00 - 3:50	Chem Lecture 7	35	Electrolytes	Beatty	1-3	1
15-Oct	1:00 - 1:50	Chem Lecture 8	36	Acid base	Beatty	1-3	1
15-Oct	2:00 - 2:50	Chem Lecture 9	37	Acid base	Beatty	1-3	1
19-Oct	1:00 - 2:50	Chem Discussion 1	38	Renal, Protein, Mineral, and Acid Disc	Beatty	2-3	1
21-Oct	8:00-9:50	UA Laboratory 1	39	Urinalysis Lab- A Group	Beatty	2-3	1
21-Oct	10:30-12:20	UA Laboratory 1		Urinalysis Lab- B Group	Beatty		
22-Oct	9:30-10:20	Exam Review 3	40	UA & Chem through Acid Base	Beatty	1-3	0.5
26-Oct	8:30-10:20	Exam 3		Exam UA & Chem through Acid Base	Beatty	1-3	1
26-Oct	1:00 - 1:50	Chem Lecture 10	41	Enzymes, Hepatobiliary, and Muscle	Lanier	1-3	1
26-Oct	2:00 - 2:50	Chem Lecture 11	42	Enzymes, Hepatobiliary, and Muscle	Lanier	1-3	1
27-Oct	8:30-9:20	Chem Lecture 12	43	Pancreas & Gastrointestinal	Lanier	1-3	1
27-Oct	9:30-10:20	Chem Lecture 13	44	Pancreas & Gastrointestinal	Lanier	1-3	1
28-Oct	1:00 - 1:50	Chem Lecture 14	45	Endocrine & Lipids	Lanier	1-3	1
28-Oct	2:00 - 2:50	Chem Lecture 15	46	Endocrine & Lipids	Lanier	1-3	1
4-Nov	9:30-11:20	Chem Discussion 2	47	Liver/MS, GI/Panc, Endo/Lipid discussion	Lanier	2-3	1
9-Nov	9:30-10:20	Cyto Lecture 1	48	FNA cytology	Lanier	1-3	1
9-Nov	10:30-11:20	Cyto Lecture 2	49	Effusion cytology	Lanier	1-3	1
12-Nov	9:30-11:20	Cyto Discussion 1	50	Cytology cases	Lanier	2-3	1
16-Nov	8:30-9:20	Exotics Chem/Cyto Lecture 1	51	Exotics Chemistry/Cytology Lecture	Alexander	1-3	1
16-Nov	9:30-10:20	Chem Discussion 3	51	Exotics Chemistry/Cytology Discussion	Alexander	2-3	0.5
18-Nov	9:30-10:20	Chem/Cyto Review 2	52	Liver/MS to Cyto	Lanier	1-3	0.5
22-Nov	8:30-10:20	Exam 4		Enzymes through Cytology	Beatty	1-3	1

Required Textbooks and/or Course Materials

- Google Chrome Browser for image and video viewing during course and for examination (as needed)
- Functioning tablet, laptop, or computer with reliable internet connection

Recommended Textbooks and/or Course Materials

- Harvey - Veterinary Hematology: A Diagnostic Guide and Color Atlas
- Stockham and Scott - Fundamentals of Veterinary Clinical Pathology, 2nd ed.
- Osbourne and Stevens- Urinalysis: A Clinical Guide to Compassionate Patient Care
- www.eclinpath.com

Methods of Evaluation

Grades will be calculated based on the following:

Item	Weight
Participation, Laboratories, Discussions, Assignments, and Online Activities	15 %
Exams for Sections 1, 2, and 3 (20% each, cumulative)	60 %
Final Exam (cumulative)	25 %
Total	100 %

Course Outline: Students will be provided with the syllabus and resources before starting the course via the Canvas website. Students are expected to have a basic understanding of hematology from the first-year core hematology course as well as relevant systems courses (e.g renal, hepatobiliary, musculoskeletal, etc). The previous course notes can be reviewed for most conditions as a guideline through the course, specifically related to pathophysiology. Information detailing topics covered during the course can be found above in the Course Schedule heading in Topics. The lectures and discussions will be delivered in person and online, synchronously via Zoom sessions. Laboratories will be held in person in V1-126. For students choosing to attend via online Zoom sessions, students are requested to utilize the web camera as well as the chat function. Each lecture will follow a similar format and will include: relevant pre-analytic considerations, pathophysiology, abnormalities with differential diagnosis lists, further diagnostics, and occasionally basic treatment information.

During Discussions sessions, students are expected to present the case in the following format: signalment, presenting complaint, history, physical examination findings, problem list, differential diagnosis, plan and diagnosis and treatment options if indicated. Primary literature searches for relevant information may be needed. Generally, cases for discussion sessions should be reviewed prior to the class meeting. Because the case should have been worked up in entirety, the student should be well prepared to show and discuss the diagnostic findings and the recommended treatment option for the case.

Discussions and Laboratories will have a required worksheet and/or assignment to complete and will be scored via the rubric in the corresponding Canvas module. The four cumulative exams will consist of multiple-choice questions and short answer/ fill in the blank. Exams will have 40 to 50 questions (usually approximately 70% MC, 30% FITB/Short answer) and around 5 to 10 of those may contain projected images about which questions will be asked. In general, test questions focus upon recall of information taught during all course meetings (lectures, discussions, laboratories) and application of that information to interpret clinically-based laboratory

data. If applicable or necessary to interpret the laboratory data, reference intervals (normal values) will be provided. Examinations will be closed note and taken individually in Exam Soft.

Note: Late assignments will not be accepted.

Grading Scheme

Course grades will be assigned based on the following grading scheme. This grading scale is **final**. The instructor may choose to apply a positive curve to benefit students as deemed appropriate.

Letter	Scale
A	100.00 – 94.00
A-	93.99 – 90.00
B+	89.99 – 87.00
B	86.99 – 84.00
B-	83.99 – 80.00
C+	79.99 – 77.00
C	76.99 – 74.00
C-	73.99 – 70.00
D+	69.99 – 67.00
D	66.99 – 64.00
D-	63.99 – 61.00
E	60.99 – 0

Course Policies

Attendance at Discussions (in person New Auditorium) and Laboratories (in-person V1-126) is required. Students must attend their assigned laboratory session, unless the course coordinator is contacted, and an excused absence is documented. Even trading of laboratory sessions between students is allowed after informing the coordinator.

Curriculum Policies

DVM curriculum policies are consistently held and reinforced across all DVM courses. Please visit the DVM webpage and review the curriculum policies listed within the [Online Student Handbook](#).

Students with Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting www.disability.ufl.edu/students/get-started. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester. **Students in UF Health Sciences programs should be mindful that unique course accommodations may not be applicable in a clinical, fieldwork or practicum setting. Thus, planning a semester in advance with the DRC Health Sciences Learning Specialist, Lisa Diekow ldiekow@ufsa.ufl.edu, is highly encouraged.**

The DRC is located on the main UF campus. ASA (Office for Academic and Student Affairs) works closely with the DRC to ensure student accommodations are met in the classroom and during exams. Melissa Pett in OASA

assists in coordinating exams and meeting recommended disability-related requirements for students with accommodations (melissacox@ufl.edu).

Course and Instructor Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available on the [GatorEvals Webpage](#). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via the [Online Platform](#). Summaries of course evaluation results are available to students at the [GatorEvals Public Results Webpage](#).

Appendix A: Faculty Lecturers

Faculty Name: Christopher Lanier DVM, MS, Diplomate ACVP (Clinical)

Office location & office hours: VC-2A, by appointment and weekly office hours listed on Canvas

Email: cjlanier88@ufl.edu

Preferred method of contact: Email

Faculty Name: Amy Alexander, DVM, DACZM

Email: alexandera@ufl.edu

Clinical Pathology Residents (laboratory and discussion instruction)

Office location & office hours: VS-21, by appointment

Dr. Jackie Dolan, email: dolanjk@ufl.edu

Dr. Laura Cagle, email: la.cagle@ufl.edu

Dr. Sarah Bosch, email sarah.bosch@ufl.edu

Preferred method of contact: Email

Appendix B: Other Information

Could be assignment details, rubrics, etc.