DEPARTMENT OF ANIMAL SCIENCE

COURSE OUTLINE – FALL 2018

AH343 DIAGNOSTIC IMAGING **- 2.5(2-0-3.5) 88HOURS**

16 Weeks

INSTRUCTOR:	Chris Mizzi DVM Rhonda Shaw RVT Tiffany Duncan RVT	**PHONE:**	780-835-6617 780-835-6702 780-835-6779
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CALENDAR DESCRIPTION:

Students will learn the principles of radiography, fluoroscopy, ultrasonography and endoscopy. Identification, use, care and maintenance of equipment and supplies is covered with emphasis on safety. Students will learn to position patients, operate equipment and develop images that produce diagnostic quality results.

PREREQUISITE(S)/COREQUISITE: NEW

- Must be registered in the GPRC Animal Health Technology Program
- AH141
- AH240
- AH246

REQUIRED TEXT/RESOURCE MATERIALS:

Lavin, L., Radiography for Veterinary Technicians, W.B. Saunders Elsevier, 2014, 5th Edition

Bassert, McCurnin's Clinical Textbook for Veterinary Technicians, Elsevier 9th edition

Diagnostic Imaging Lab Manual Course Pack

DELIVERY MODE(S):

Lab (Tiffany Duncan and Rhonda Shaw)

Lecture (Dr. Mizzi)

COURSE OBJECTIVES/LEARNING OUTCOMES:

Unit 1 Principles of Diagnostic imaging. At the end of this unit the student will be able to Discuss and Define:

A) Principles of Radiography
B) How an x-ray machine works
C) Principles of fluoroscopy
D) Principles of Ultrasonography
E) Principles of MRI
F) Principles of CAT
G) Principles of Nuclear Scintigraphy
H) Principles of Infrared Thermography
I) Principles of Endoscopy

Unit 2 Radiation Safety. At the end of this unit the student will be able to Discuss and Define:

A) The use and purpose of thermo luminescent dosimeters (TLD).
B) Effects of radiation exposure
C) Safe radiation practices

Unit 3 Accessory Equipment for Radiology. At the end of this unit the student will be able to Define and Discuss:

A) The characteristics of radiology grids
B) The characteristics of intensifying screens
C) The characteristic of Collimators and Filtration
D) The uses and benefits of positioning aids

Unit 4 Contrast Techniques. By the end of this unit the student will be able to Define and Discuss:

A) Types of contrast material
B) How and why to perform different types of contrast techniques

Unit 5 Detail, Density and Contrast. At the end of this unit the student will be able to:

A) Produce quality x-rays
B) Be able to Rectify problems with detail density and contrast of x-rays

Unit 6 Radiographic film processing. At the end of this unit the student will be able to Define and Describe:

A) The characteristics of radiographic film
B) Techniques of film storage and identification
c) Steps of the development procedure for x-ray film

Unit 7 Technical Errors in Radiology and their prevention. At the end of this unit the student will be able to Define and Describe the common errors and problems with taking and developing x-rays and how to rectify them or prevent them.

Diagnostic Imaging Labs

Lab A: Introduction to Diagnostic Imaging. Upon completion of this lab students will be able to:

A) Identify and discuss the importance of personal safety equipment and procedures when taking a radiograph of a small animal patient.
B) Locate and discuss parts of a stationary radiology machine
C) Correctly identify and use common radiology equipment
D) Correctly set up a stationary machine to take a radiograph
E) Utilize a technique chart to set a radiology machine
F) Discuss proper use, cleaning and storage of radiology cassettes
G) Discuss proper use and cleaning of an automatic processor

Lab B: Quality Assurance. Upon completion of this lab students will be able to describe quality assurance procedures and their importance.

Lab C: Canine Skull, Thorax and Abdomen. Upon completion of this lab students will be able to:

A) Describe positioning of the canine patient for lateral (Lat), and ventrodorsal (VD)
    a. Skull
    b. Thorax
    c. Abdomen
B) List and demonstrate steps to follow when taking a radiograph
C) Utilize the heel effect
D) Set-up canine patient for Lateral and Ventrodorsal radiographs of:
    a. Skull
    b. Thorax (left and right lateral)
    c. Abdomen

Lab D: Canine Spine. Upon completion of this lab students will be able to:

A) Describe positioning of the canine animal for lateral (Lat) and ventrodorsal (VD):
    a. Cervical Spine
    b. Thoracic Spine
    c. Lumbar Spine
    d. Thoraocolumbar Spine
    e. Frontal 90 rostrocaudal closed mouth
B) List and demonstrate steps to follow when taking a radiograph
C) Set-up canine patient for lateral and ventrodorsal radiographs of:
    a. Cervical Spine
    b. Thoracic Spine
    c. Lumbar Spine
    d. Thoracolumbar Spine
    e. Frontal 90 rostrocaudal closed mouth

Lab E: Canine Front Limb. Upon completion of this lesson the student should be able to:

A) Describe positioning of the canine patient for lateral and:
    a. Dorsopalmar Metacarpus - Phalanges
    b. Craniocaudal Radius/Ulna
    c. Flexed Lateral/Craniocaudal Elbow
    d. Humerus

B) List and demonstrate steps to follow when taking a radiograph on a split plate using a lead blocker
C) Set-up canine patient for radiographs of:
    a. Lat/DPa Metacarpus - Phalanges
    b. Lat/CrCa Radius/Ulna
    c. Lat flexed/CrCa Elbow
    d. Lat Humerus
    e. Lat Shoulder

Lab F: Canine Pelvis. Upon completion of this lab students will be able to:

A) Describe positioning of the canine patient for lateral and:
    a. Ventrodorsal Frog-leg/Extended Pelvis
    b. Caudocranial/Craniocaudal Stifle
    c. Caudocranial Tibia/Fibula
    d. Craniocaudal Femur
B) List and demonstrate steps to follow when taking a radiograph
C) Discuss Orthopedic Foundation for Animals (OFA) and PennHIP Radiographic Evaluations.
D) Discuss and demonatrate the positioning for a TPLO xray
E) Set-up patient for Lat, and VD Extended of:
    a. Pelvis
F) Set-up patient for radiographs of:
    a. Lat/CaCr Stifle
    b. Lat/CaCr Tibia/Fibula
    c. Lat/CrCa Femur
    d. Lat/extended VD Pelvis

Lab G: Feline Thorax, Abdomen, Pelvis and Skull. Upon completion of this lab students will be able to:

A) Describe positioning of a feline patient for lateral (Lat) and ventrodorsal (VD)
    a. Thorax
    b. Abdomen
    c. Pelvis
    d. Cat-o-gram
    e. Skull
B) List and demonstrate steps to follow when taking a radiograph
C) Set-up feline patient radiographs of:

a. Lat/VD Thorax
b. Lat/VD Abdomen
c. Lat/VD Pelvis Frog leg
d. Lat/VD Cat-o-gram
e. Lat/DV Skull

Lab H: Introduction to Dental Radiographs. Upon completion of this lab students will be able to:

A) Describe positioning of a canine and feline patient for:
    a. Bisecting angle technique
    b. Parallel technique
    c. Incisors and canines
B) Set up a cadaver for the following radiographs:
    a. Bisecting angle technique- Upper molars & Premolars
    b. Parallel technique- Lower molars and premolars
    c. Incisors and canines

Lab I: Feline Extremities and the Basics of Ultrasound. Upon completion of this lab students will be able to:

A) Describe positioning of a feline patient for lateral and:
    a. Craniocaudal Femur
    b. Caudocranial/Craniocaudal Humerus
    c. Dorsoplantar Metatarsus-Phalanges
B) List and demonstrate steps to follow when taking a radiograph
C) Set-up feline patient for radiographs of:
    a. Lat/CrCa Femur
    b. Lat/CaCr Humerus
    c. Lat/DPl Metatarsus-Phalanges
D) Describe the basic principles of ultrasound
E) Explain basic care and cleaning of a transducer

Lab J: Positioning Review and Cystography. Upon completion of this lab students will be able to:

A) Describe and demonstrate positioning of a feline or canine patient for all views practiced
B) Critique a radiograph
C) Identify equipment for cystography
D) List preparation recommendations for cystography
E) List the steps in a cystogram

F) Calculate a dosage for a cystogram
G) Demonstrate the steps of a positive contrast cystogram
H) Demonstrate positioning for abdominal survey radiographs (Lat and VD)
I) Demonstrate positioning for VD and Lateral cystogram
J) Review common radiographic positions used in previous labs in preparation for evaluations

Lab K: Feline Evaluation: Upon completion of this lab, students will be evaluated on the following skills on a feline patient within a designated time limit:

A) Identify, measure and set up radiology machine for an assigned position.
B) Demonstrate correct steps to follow upon taking a radiograph
C) Demonstrate proper safety procedures
D) Develop and critique exposed radiograph

Lab L: Contrast Media and Exotics. Upon completion of this lab students will be able to:

A) Identify equipment for upper GI barium series
B) List preparation recommendations for an upper GI barium series
C) List the steps in gastrointestinal barium series radiographs
D) Calculate a 60% barium sulphate dosage from a 105% concentrated solution.
E) Demonstrate barium administration orally via syringe
F) Demonstrate positioning for abdominal survey radiographs (Lat and VD)
G) Demonstrate positioning for VD and Lateral barium series
H) Discuss common exotics seen in clinical practice and techniques used to achieve diagnostic radiographs
I) Demonstrate positioning of various exotics upon availability.

Lab M: Lab M: Canine Evaluation: Upon completion of this lab, students will be evaluated on the following skills on a canine patient within a designated time limit:

E) Identify, measure and set up radiology machine for an assigned position.
F) Demonstrate correct steps to follow upon taking a radiograph
G) Demonstrate proper safety procedures
H) Develop and critique exposed radiograph

Equine Labs:

Lab # 1: Intro to Mobile Equine Radiographs: Upon completion of this lab the student will be able to:

- Identify common reasons for equine radiographs
- Identify the parts of and know how to use the mobile machine

- Identify and discuss some of the complications with equine patients
- List and demonstrate steps to follow when taking a radiograph of:
    - Fetlock
    - Metacarpus and Metatarsus
    - Carpus and Tarsus
    - Sesamoids
- Preparations
- Log use
- Technique chart use and adaptations to the numbers
- Machine and patient set up using a skeleton model
- Safety issues
- Develop X-ray film
- Critique developed X-ray to improve upon them

Lab # 2: Equine Radiology Handling: Upon completion of this lab the student will be able to:

- Safely position an equine patient to obtain radiographs of:
    - Navicular
    - Coffin
    - Review views from Lab # 1
- Demonstrate safe and efficient work habits to achieve co-operation of the equine patient
- Critique the developed radiographs in a constructive way
- Practice placing foot on blocks / positioning

Lab # 3: Equine Radiology: Upon completion of this lab the student will be able to:

- Safely position an equine patient to obtain radiographs of:
    - Pastern
    - Carpus
    - Metatarsus
    - Tarsus
    - Review views from Lab # 1 and Lab #2
- Demonstrate safe and efficient work habits to achieve co-operation of the equine patient
- Critique the developed radiographs in a constructive way

Lab #4: Equine Radiology Review: Upon completion of this lab the student will have a good understanding of all that is involved in making standard radiographs of the horse extremities

Lab #5: Equine Radiology Evaluations: Upon completion of this lab, students will be evaluated on skills learned within a designated time limit:

- Practical Equine Lab Evaluations

TRANSFERABILITY: (if applicable)

A list of institutions to which this course transfers (For example: UA, UC, UL, AU, GMU, CU, CUC, KUC. Please note that this is a sample and it must be replaced by your specific course transfer)

*Warning: Although we strive to make the transferability information in this document up-to-date and accurate, the student has the final responsibility for ensuring the transferability of this course to Alberta Colleges and Universities. Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at Alberta Transfer Guide main page http://www.transferalberta.ca or, if you do not want to navigate through few links, at http://alis.alberta.ca/ps/tsp/ta/tbi/onlinesearch.html?SearchMode=S&step=2

** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability

(The following criteria may be changed to suite the particular course/instructor)

Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

EVALUATIONS:

GRADING CRITERIA:
GRADING CONVERSION CHART for ANIMAL HEALTH TECHNOLOGY
OVERALL GRADE POINT AVERAGE HAS TO BE 2.0 OR HIGHER TO BE SUCCESSFUL IN THE AHT PROGRAM.

Alpha Grade	**4-point Equivalent**	**Percentage Guidelines**		**Alpha Grade**	**4-point Equivalent**	**Percentage Guidelines**
A+	4.0	90-100		C+	2.3	67-69
A	4.0	85-89		C	2.0	63-66

A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		FAIL	1.3	55-59
B	3.0	73-76		FAIL	1.0	50-54
B-	2.7	70-72		WF	0.0	00-49

	EXAMINATIONS	Mark Distribution
	A. Quizzes & Assignments	25%
	B. Midterm Exam	10%
	C. Final Exam	25%
	D. Equine Practical Positioning Evaluation	7%
	E. Small Animal Practical Positioning Evaluations	28%
	F. Lab Management	5%
		100%

*A minimum of 60% must be obtained in order to successfully pass AH 343.

COURSE SCHEDULE/TENTATIVE TIMELINE:

See posted lab schedule

STUDENT RESPONSIBILITIES:

Enrolment at GPRC assumes that the student will become a responsible citizen of the College. As such, each student will display a positive work ethic, take pride in and assist in the maintenance and preservation of Institute property, and assume responsibility for his/her education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting instructor expectations concerning attendance, assignments, deadlines, and appointments.

STATEMENT ON PLAGIARISM AND CHEATING:

Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the College Admission Guide at http://www.gprc.ab.ca/programs/calendar/ or the College Policy on Student Misconduct: Plagiarism and Cheating at http://www.gprc.ab.ca/about/administration/policies/

**Note: all Academic and Administrative policies are available on the same page.

ADDITIONAL INFORMATION:

- Disruptive behavior in the class will result in the student being excused from the class or lab – this includes use of cell phones or any hand held equipment that has not been approved by the instructor.
- Any student wishing to see a marked quiz or midterm must make an appointment with the instructor to view or go over. Final exams are not available to be viewed by a student.

YEAR: 2018