



DEPARTMENT OF ANIMAL HEALTH TECHNOLOGY

COURSE OUTLINE – AH 343

DIAGNOSTIC IMAGING

INSTRUCTOR: Dr. Udenberg, Rhonda **PHONE:** 780-835-6702
Shaw, Dr. Jedra

OFFICE: AS 141,133,137 **E-MAIL:** [Click here to enter text.](#)

OFFICE HOURS: 9:00am – 4:00pm

PREREQUISITE(S)/COREQUISITE: AH 141 Anatomy and Physiology I and II, Ah 172 Veterinary Terminology, AH 173 Applied Mathematics, AH 112 Animal Behaviour and Restraint, AH 246 Animal Nursing I

REQUIRED TEXT/RESOURCE MATERIALS:

Lavin, L., *Radiology in Veterinary Technology*, W.B. Saunders Company, 2007, 4th Edition
Diagnostic Imaging Lab Manual Course Pack and Diagnostic Imaging Theory course pack.

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.

CREDIT/CONTACT HOURS:

Credits 5.0

Contact Hours = 86

DELIVERY MODE(S): Lectures and Labs

Lectures and labs. Dr. Udenberg will instruct the theory lectures, Rhonda Shaw will instruct the small animal labs, Dr. Jedra will instruct the equine labs.

OBJECTIVES (Optional):

- A.** Principles of Radiology
- B.** Principles of fluoroscopy, MRI, xerography, scintography, infrared thermography, and computed tomography
- C.** Principles of Ultrasonography
- D.** Principles of Endoscopy
- E.** Safety Procedures
- F.** Accessory Equipment for Radiology
- G.** Detail, Density and Contrast
- H.** Contrast Techniques
- I.** Processing of Radiographic Film
- J.** Technical Errors in Radiology and their Prevention
- K.** Diagnostic Imaging Lab Module

TRANSFERABILITY:

**** 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**

GRADING CRITERIA:

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	4-point Equivalent	Percentage Guidelines	Designation
A⁺	4.0	90 – 100	EXCELLENT
A	4.0	85 – 89	
A⁻	3.7	80 – 84	FIRST CLASS STANDING
B⁺	3.3	77 – 79	
B	3.0	73 – 76	GOOD
B⁻	2.7	70 – 72	
C⁺	2.3	67 – 69	SATISFACTORY
C	2.0	63 – 66	
C⁻	1.7	60 – 62	MINIMAL PASS*
F	1.3	55 – 59	FAIL
	1.0	50 – 54	
	0.0	0 – 49	
WF	0.0	0	FAIL, withdrawal after the deadline

*overall grade average has to be 2.0 or higher to be successful in the program.

EXAMINATIONS:

There is a supplemental examination available only for the final exam. Students must have a mark of 50% or greater to be allowed to write a supplemental exam

Students must achieve a minimum passing grade of 60% in each of the lab and classroom portions of this course to pass AH 343 Diagnostic Imaging.

Missing a lab session without either a written valid excuse and/or notifying the instructor prior to the lab session will result in an automatic 5% deduction from the final lab grade for each occurrence. Additional deductions may occur at the discretion of the instructors in the Lab Management portion of the evaluation scheme.

Mark Distribution

A. Quizzes	20%
B. Assignments (Worksheets)	5%
C. Midterm Exam	10%
D. Equine Practical Position Evaluation	7%
E. Small Animal Practical Positioning Evaluations	28%
F. Final Exam	25%
G. Lab Management	5%
	100%

STUDENT RESPONSIBILITIES:

STATEMENT ON PLAGIARISM AND CHEATING:

Please refer to pages 49-50 of the College calendar regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely.

*COURSE SCHEDULE/TENTATIVE TIMELINE:

A. Principles of Radiology

Upon successful completion of this Learning Outcome Guide, you will be able to discuss the generation of x-rays, the behavior of x-rays and the basic requirements of an x-ray tube.

1. identify on a diagram the basic components of an X-ray tube and the tube head; be able to describe the purpose or function of each component.
 2. explain and discuss the behavior of x-rays and their special properties
 3. discuss and give areas of x-ray tube failure
 4. differentiate the various of types of radiology machines
 5. list the factors that determine x-ray absorption
 6. discuss the effects of the following factors on x-ray production and image formation:
milliamperage, time, kilovoltage, distance
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Principles of fluoroscopy, MRI, xerography, scintigraphy, infrared thermography, and computed tomography LOG ID: 21880

Upon successful completion of this Learning Outcome Guide, you will be able to discuss and compare alternative forms of diagnostic imaging including fluoroscopy, magnetic resonance imaging, xerography, scanography, infrared thermography and scintigraphy.

1. define and explain fluoroscopy and it's principles
2. list the advantages and disadvantages of fluoroscopy
3. define and explain xerography and it's principles
4. list the advantages and disadvantages of xerography
5. define cat scan
6. discuss two veterinary applications of infrared thermography, two applications of MRI and two applications of scintigraphy

Principles of Ultrasonography LOG ID: 21883

Upon successful completion of this Learning Outcome Guide, you will be able to discuss the use of ultrasonography as a diagnostic and therapeutic aid in veterinary medicine

1. discuss the principles of operation and construction of ultrasound transducers
2. outline various display modes and their applications
3. contrast the relationship between frequency and wavelength; wave length and resolution; frequency and attenuation; attenuation and resolution
4. outline patient preparation prior to ultrasonography
5. discuss the care and cleaning of ultrasound probes

Principles of Endoscopy

Upon successful completion of this Learning Outcome Guide, you will be able to discuss the use of endoscopy as a diagnostic and therapeutic aid in veterinary medicine.

1. list and discuss the 2 main types of endoscopes
2. list 10 different cautions in the handling of endoscopes
3. list 5 different considerations in the cleaning, disinfection and sterilization of endoscopes
4. list 5 different considerations for storing endoscopes

Safety Procedures

Upon successful completion of this Learning Outcome Guide, you will be able to identify health hazards and precautions to minimize the radiation exposure to personnel, the patient and the public.

1. list 5 areas of the body which are most sensitive to ionizing radiation
2. list 2 areas of the body which are most resistant to ionizing radiation
3. list 6 possible effects of chronic exposure to low levels of radiation
4. define absorbed dose and dose equivalent and state the maximum permissible dose for individuals using x-ray technology
5. define a TLD (thermoluminescent dosimeter) badge and give 5 precautions

for its use

6. list and explain the 3 basic rules of protection from radiation
7. list 11 other safety practices which will reduce radiation exposure

Accessory Equipment for Radiology LOG ID: 21887

Upon successful completion of this Learning Outcome Guide, you will be able to discuss accessory equipment for radiology which enhances safety and image quality

1. define the following: fast, medium and slow screens; rare earth screens, high medium and slow speed film; and exposure latitude.
2. describe and discuss care of intensifying screens, cassettes and x-ray film
3. explain grids, grid use, grid ratio and the types of grids used in radiology
4. explain what is a filter, the types of filters and their use
5. explain and discuss a collimator and its 3 advantages
6. explain and discuss the use of a Potter-Bucky, calipers and positioning aids
7. explain the principle of an intensifying screen and its operation
8. compare the construction of radiographic film and a film cassette

Diagnostic Imaging Lab Module

Upon successful completion of this Learning Outcome Guide, you will be able to demonstrate the ability to take and develop diagnostic radiographs of large and small animals in a manner which is safe for him/herself, the patient, clinic personnel and the public.

1. Demonstrate and explain patient preparation and recovery procedures for diagnostic imaging labs.
2. Identify and apply common radiology equipment and appropriate usage
3. Demonstrate and follow safety procedures optimum for patient, clinic personnel and the public
4. Demonstrate manual and automatic processing of radiographs
5. Critique radiographs to identify areas for improvement
6. Discuss and apply troubleshooting techniques for exposure and developing of radiographs to obtain diagnostic radiographs
7. Demonstrate positioning, restraint and setting the machine for equine, canine and feline patients necessary for routine diagnostic radiographs
8. Demonstrate use of digital radiology
9. Quality control and quality assurance

Created by: Date:

Signature:

Approved by: Date:

Signature: