



**DEPARTMENT OF ANIMAL HEALTH TECHNOLOGY**

**COURSE OUTLINE – AH 343**

**DIAGNOSTIC IMAGING**

**INSTRUCTOR:** Dr. C. Barlund, **PHONE:** 780-835-6701  
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**OFFICE**

**HOURS:** 9:00am – 4:00pm unless otherwise specified

**PREREQUISITE(S)/COREQUISITE:** Students must complete and pass AH246

**REQUIRED TEXT/RESOURCE MATERIALS:**

- 1: Lavin, L., *Radiology in Veterinary Technology*, W.B. Saunders Company, 2001, 3rd Edition
- 2: Diagnostic Imaging Lab Manual 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. Barlund will instruct the theory lectures, Wendy Kane will instruct the laboratory portion.

**OBJECTIVES:**

- A.** Principles of Radiology
- B.** Principles of fluoroscopy, MRI, xerography, scintigraphy, 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

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

\*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. ½ mark will be deducted for any spelling mistakes on assignments and examinations. Medical corrections are required on all assignments and examinations, ½ mark will be deducted for any non-medical corrections.

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

### **STUDENT RESPONSIBILITIES:**

\*Students are expected to wear dosimeters at all times while conducting laboratory assignments.\*

### **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:**

**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.

**Principles of fluoroscopy, MRI, xerography, scintigraphy, infrared thermography, and computed tomography**

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/CT scan
6. discuss two veterinary applications of; infrared thermography, MRI and scintigraphy

**Principles of Ultrasonography**

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**

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 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 you, 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 radiographic film
5. Critique radiographs to identify areas for improvement
6. Discuss and apply troubleshooting techniques for exposure and developing 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 radiography
9. Quality control and quality assurance

Created by: Christy Barlund    Date: August 29, 2011    Signature:

Approved by: Trisha Holubowich    Date:    Signature: