A. CATALOG DESCRIPTION
1. Credits: 3
2. Hours/Week: 1 lecture/2 laboratory, equivalent to 5 hours per week
3. Prerequisites (Course discipline/number): Grade of C or better in: VT 1220, VT 1510. VT 2910, VT 1900, VT 2020, VT 1710, VT 1410.
4. Co-requisites (Course discipline/number): None
5. MnTC Goals (if any): NA

This is a lecture and laboratory course introducing the practical and theoretical aspects of diagnostic imaging in veterinary medicine. Topic areas may include: basic principles of x-ray physics, radiation safety, radiographic equipment and accessories, processing radiographs, identification and storage of radiographic film, patient positioning, and legal requirements.

B. DATE LAST REVISED (Month, year): February, 2011

C. OUTLINE OF MAJOR CONTENT AREAS:
1. Radiation Safety
   a) Protection
   b) Standard precaution procedures
   c) Recognizing faulty equipment operations
   d) Radiation monitoring devices
2. Laws Regulating Veterinary Medical Imaging
   a) Quality Assurance
   b) Quality control
   c) X-ray records and filing and storing
   d) Film identification
3. Principles of Imaging
   a) Physics of X-ray generation
   b) Terminology
   c) History
   d) Techniques charts
4. Function and Anatomy of X-ray Machines
   a) X-ray tube anatomy
   b) Stationary machines
   c) Portable machines
   d) Dental machines
   e) Cleaning and maintenance
   f) Instrument controls
   g) Exposure variables
5. Radiographic Equipment
   a) Radiographic Film
   b) Screens and cassettes
   c) Positioning aids
6. Positioning of patients
   a) Terminology
   b) Thoracic limb
   c) Pelvic limb
   d) Soft tissues
   e) Dental
   f) Large Animals
7. Darkroom Techniques and X-ray Processing
   a) Darkroom set-up
   b) Manual processing
   c) Automatic processing
   d) Artifacts
D. **LEARNING OUTCOMES (GENERAL):** The student will be able to:
1. Demonstrate an understanding of basic radiographic theory and terminology.
2. Demonstrate radiation safety.
3. Demonstrate the general principles of animal positioning for diagnostic quality radiographs.
4. Develop and label x-ray film both manually and with an automatic processor.
5. Explain how technical artifacts are generated and demonstrate how they are prevented when taking radiographs.
6. Demonstrate proper use of radiographic logs, reports, files and records.
7. Demonstrate proper use and maintenance of imaging equipment.
8. Identify concepts and terms relating to exposure and control factors, such as density, contrast, exposure equations, directional terms and critique points of radiographs.
9. Demonstrate quality control tests required by state regulatory agencies.

E. **LEARNING OUTCOMES (MNTC):** NA

F. **METHODS FOR EVALUATION OF STUDENT LEARNING:**
1. Laboratory reports and/or quizzes
2. Objective and/or subjective tests
3. Laboratory practical tests
4. Course assignments
5. Group work/projects
6. Attendance (especially laboratory attendance)

G. **RCTC CORE OUTCOME(S) ADDRESSED:**
- Communication
- Civic Responsibility
- Critical Thinking
- Personal/Professional Accountability
- Global Awareness/Diversity
- Aesthetic Response

H. **SPECIAL INFORMATION (if any):**
The initial lab session explains and familiarizes the student with general safety hazards and safety equipment to the lab. During the pre-lab discussion, the hazardous characteristics of any materials used during a lab are discussed. In addition, if the lab involves any potentially infectious or zoonotic material, the students will be instructed on the proper use and disposal. The instructor will direct all students to where necessary protective equipment while working with any hazardous chemicals. A copy of Material Safety Data Sheets for chemicals used is available in the lab.