I. **OVERVIEW**

The following information will appear in the 2012 - 2013 catalog

ANSC 252  **Veterinary Equipment: Operation, Instrumentation, and Safety**  3 Units

*Recommended for Success:* Before enrolling in this course, students are strongly advised to satisfactorily complete ENGL 50.

Introduction to diagnostic imaging equipment used in veterinary practices. Safe operation of radiographic equipment. Developing, trouble-shooting and reading radiographs. Use of ultra-sound equipment. Use of gas anesthesia equipment - safety and proper procedure.

Field trips are required.  (A-F or P/NP - Student choice) Lecture

Transfer: (CSU)

II. **LEARNING CONTEXT**

Given the following learning context, the student who satisfactorily completes this course should be able to achieve the goals specified in Section III, Desired Learning:

A. **COURSE CONTENT**

1. **Required Content:**

a. Procedures basic to preparing a technique chart
   i. Protect against hazards of exposure
   ii. kVp and mAs
   iii. Table-top and grid requirements
   iv. Film types and exposure factors
   v. Machine factors affecting exposure and radiographic detail
   vi. Patient conditions affecting exposure factors

b. Radiation safety precautions
   i. California Radiation Control Regulations & Radiation Safety in Veterinary Practice (relevant sections)
   ii. Radiation monitoring devices
   iii. Protective equipment
   iv. Mechanical and chemical restraints for patients
   v. Collimators
   vi. Storage of protective equipment

c. Understanding diagnostic radiographs
i. Measurement of patient

ii. Positioning patient

iii. Heel effect

iv. Time of exposure

d. Radiographic procedures requiring contrast media
   i. Procedures requiring contrast media
   ii. Contrast agents and equipment
   iii. Mechanics of common procedures
       a. Gastrointestinal series
       b. Esophagrams
       c. Intravenous pyleograms
       d. Cystograms
       e. Myelograms

iv. Minimizing patient risks

v. Patient preparation

e. Understanding manual processing of radiographic films
   i. “Time-temperature” method
   ii. Avoiding artifacts
   iii. Problem-solving effects
       a. Developer too weak/strong
       b. Fixer too weak/strong
       c. Time in developer
       d. Time in fixer
       e. Deviations in developer temperature
       f. Inadequate washing

f. Automatic processing of radiographs
   i. Developing temperatures
   ii. Radiographic artifacts
   iii. Problem solving

g. Labeling and filing radiographs
i. Indicating right or left using radiographic markers
ii. Indicating position
iii. Veterinary facility
iv. Filing and storing

h. Ultrasound procedures
   i. Patient prep
   ii. Ultrasound principles
   iii. Restraint techniques
   iv. Hazards of ultrasound exposure
   v. Labeling

i. Anesthesia
   i. Anesthetic agents and their properties
   ii. Anesthetic machine preparation and safe operation
   iii. Administration systems
      a. Semi-closed
      b. Closed
      c. Semi-open
      d. open
   iv. Endotracheal intubation

B. ENROLLMENT RESTRICTIONS
   1. Advisories
      Before enrolling in this course, students are strongly advised to satisfactorily complete ENGL 50.

C. HOURS AND UNITS

<table>
<thead>
<tr>
<th>INST METHOD</th>
<th>TERM HOURS</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lect</td>
<td>54</td>
<td>3.00</td>
</tr>
<tr>
<td>Lab</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
D. METHODS OF INSTRUCTION (TYPICAL)
Instructors of the course might conduct the course using the following method:

1. Lecture and use of visual aids.
2. Discussion and problem solving.
3. Assign homework and outside reading.
4. Guest speakers.

E. ASSIGNMENTS (TYPICAL)

1. EVIDENCE OF APPROPRIATE WORKLOAD FOR COURSE UNITS
Time spent on coursework in addition to hours of instruction (lecture hours)

   a. Study for weekly quizzes
   b. Weekly reading assignments / periodical reviews
   c. Study for midterm exam
   d. Study for final exam

2. EVIDENCE OF CRITICAL THINKING
Assignments require the appropriate level of critical thinking

   a. When taking direction on the position of a patient, be able to describe and explain the direction the patient will be positioned in as well as the direction the image will be taken.
   b. Explain how to tell if a radiograph is over exposed and what you could increase or decrease by the way of technique to improve the image.
   c. What is the importance of radiographic labeling? Explain how a technician can tell the position of the patient based on labeling.

F. TEXTS AND OTHER READINGS (TYPICAL)

3. Other: Surgical scrubs, protective eyewear

III. DESIRED LEARNING

A. COURSE GOAL
As a result of satisfactory completion of this course, the student should be prepared to:

   describe safe operation, proper procedures and maintenance of equipment covered in this course. (i.e. Radiograph machine, ultra-sound equipment and anesthesia equipment.)

B. STUDENT LEARNING GOALS
Mastery of the following learning goals will enable the student to achieve the overall course goal.
1. **Required Learning Goals**
   
   Upon satisfactory completion of this course, the student will be able to:
   
   a. Prepare and describe the how to use diagnostic imaging equipment.
   
   b. Explain the use of radiation monitoring devices.
   
   c. Explain the diagnostic value of radiographic procedures requiring contrast media.
   
   d. Understand the importance of proper identification and filing techniques for radiographs.
   
   e. Explain the technicians role in assisting with diagnostic ultrasound procedures.
   
   f. Devise a checklist for the safe operation of anesthetic machines.
   
   g. Determine the proper administration system and calculate appropriate flow rates.
   
   h. Explain anesthetic instrumentation, induction, and monitoring for various animal species.

IV. **METHODS OF ASSESSMENT (TYPICAL)**

A. **FORMATIVE ASSESSMENT**
   
   1. Written homework
   
   2. Reading reports
   
   3. Written exams
   
   4. Periodic reviews

B. **SUMMATIVE ASSESSMENT**
   
   1. Mid-term written examination
   
   2. Final written examination