



El Camino College  
COURSE OUTLINE OF RECORD – Official

<b>Course Acronym:</b>	RTEC
<b>Course Number:</b>	124
<b>Descriptive Title:</b>	Radiographic Positioning 1B
<b>Division:</b>	Health Sciences and Athletics
<b>Department:</b>	Radiologic Technology
<b>Course Disciplines:</b>	Radiologic Technology
<b>Catalog Description:</b>	<p>In this course, students will study additional principles of radiographic positioning. Emphasis is placed on those procedures involving the shoulder, bony thorax, pelvis, vertebral column, contrast media, gastrointestinal system, genitourinary system and biliary systems. Special imaging considerations for the pediatric and geriatric patients, the acutely ill, surgical patients, and trauma patients will also be covered. Radiographic technique, anatomy, specialized mobile and fluoroscopic equipment, patient safety, and radiation protection will be included. Laboratory practice, radiographic image analysis and critique, and topographical anatomy are presented as they apply in the production of optimum radiographic examinations.</p>
<b>Prerequisite:</b>	<p>Radiologic Technology 106</p> <p>Radiologic Technology 111</p> <p>Radiologic Technology 123</p> <p>with a minimum grade of C in prerequisite</p>
<b>Co-requisite:</b>	Radiologic Technology 107
<b>Recommended Preparation:</b>	
<b>Enrollment Limitation:</b>	
<b>Hours Lecture (per week):</b>	3
<b>Hours Laboratory (per week):</b>	3
<b>Outside Study Hours:</b>	6
<b>Total Course Hours:</b>	108
<b>Course Units:</b>	4
<b>Grading Method:</b>	Letter Grade only
<b>Credit Status:</b>	Credit, degree applicable
<b>Transfer CSU:</b>	Yes
<b>Effective Date:</b>	5/15/2006
<b>Transfer UC:</b>	
<b>Effective Date:</b>	
<b>General Education:</b>	ECC

<b>Term:</b>	
<b>Other:</b>	
<b>CSU GE:</b>	
<b>Term:</b>	
<b>Other:</b>	
<b>IGETC:</b>	
<b>Term:</b>	
<b>Other:</b>	
<b>Student Learning Outcomes:</b>	<p><b>SLO #1 ALARA &amp; Shielding</b></p> <p>Students will apply ALARA principles of radiation safety by assessing patient risk to radiation exposure during a radiographic exam, and appropriately shield the patient during the simulated positioning lab evaluation.</p> <p><b>SLO #2 Radiographic Positioning</b></p> <p>Students will demonstrate correct positioning of patients for quality radiographic exams of the Abdomen, Thorax, Pelvis, Spine and Radiographic Contrast studies to include: BE, UGI, IVP, Cystography and ERCP.</p> <p><b>SLO #3 Modification for Patient Condition</b></p> <p>Students will assess patient's condition and pathology, and then make appropriate modifications to the procedures based on their condition.</p>
<b>Course Objectives:</b>	<ol style="list-style-type: none"> <li>1. Identify standard radiographic positions and anatomical structures on a radiographic image.</li> <li>2. Use topographical anatomy in the performance of radiographic positions.</li> <li>3. Demonstrate the use of accessories, protective devices, and technical competence to perform diagnostic imaging procedures and meet acceptable patient care standards.</li> <li>4. Evaluate and analyze radiographic images.</li> <li>5. Demonstrate the proper use of radiographic equipment and safely perform radiographic procedures while applying radiation safety principles and shielding while using the energized laboratory and radiographic phantoms.</li> <li>6. Characterize the nature, safe use, and hazards associated with use of contrast media in radiographic procedures.</li> <li>7. Describe the contraindications, symptoms and medical interventions for a patient with a contrast media reaction.</li> <li>8. Compare and contrast the benefits and risks of a fluoroscopy procedure.</li> <li>9. Demonstrate the proper use of fixed and mobile radiographic equipment.</li> <li>10. Formulate special technical considerations and demonstrate positioning skills necessary when performing radiographic procedures on an infant, elderly, or surgical patient.</li> <li>11. Explain the types of immobilization devices and positioning considerations required for patients with fractures, wounds, head injuries and other types of trauma.</li> <li>12. Describe the patient preparation for barium and iodinated contrast studies.</li> <li>13. Identify specific types of tubes, lines and catheters and describe the special problems faced in performing procedures on the acutely ill patient with these devices in place.</li> <li>14. Explain the appropriate radiation protection required when performing mobile and surgical radiography.</li> </ol>

**Major Topics:**

**I. Radiographic Positioning of the Torso (22 hours, lecture)**

- A. Standard radiographic positions for Abdomen
  - 1. Supine Abdomen
  - 2. Upright Abdomen
  - 3. Left lateral decubitus Abdomen
- B. Standard radiographic positions for Chest:
  - 1. AP Supine Chest
  - 2. Semi-upright chest
  - 3. Bilateral decubitus chest
- C. Standard radiographic positions for shoulder girdle, bony thorax
  - 1. AP shoulder, internal, external rotation
  - 2. AC joints
  - 3. SC joints
  - 4. Clavicle
- D. Standard radiographic positions for Vertebral Column
  - 1. Cervical spine
  - 2. Thoracic spine
  - 3. Lumbar spine
  - 4. Sacrum/coccyx
  - 5. Sacro-iliac joints
  - 6. scoliosis
- E. Standard radiographic positions for pelvis and hips
  - 1. AP pelvis
  - 2. Judet pelvis
  - 3. AP hip
  - 4. Lateral hip
    - 1. Frog lateral
    - 2. Lauenstein lateral

**II. Radiographic Positioning Applications for the Torso (29 hours, lab)**

- A. Standard radiographic positions for Abdomen
  - 1. Supine Abdomen
  - 2. Upright Abdomen
  - 3. Left lateral decubitus Abdomen
- B. Standard radiographic positions for Chest:
  - 1. AP Supine Chest
  - 2. Semi-upright chest
  - 3. Bilateral decubitus chest
- C. Standard radiographic positions for shoulder girdle, bony thorax
  - 1. AP shoulder, internal, external rotation
  - 2. AC joints
  - 3. SC joints
  - 4. Clavicle
- D. Standard radiographic positions for Vertebral Column
  - 1. Cervical spine
  - 2. Thoracic spine
  - 3. Lumbar spine
  - 4. Sacrum/coccyx
  - 5. Sacro-iliac joints
  - 6. scoliosis
- E. Standard radiographic positions for pelvis and hips
  - 1. AP pelvis
  - 2. Judet pelvis

3. AP hip
4. Lateral hip
  1. Frog lateral
  2. Lauenstein lateral

**III. Radiographic Positioning Applications for the Mobile and C-Arm Radiography (13 hours, lecture)**

- A. Portable radiography
  1. AP Chest
  2. Ortho
- B. Surgical radiography
  1. C-Arm usage
- C. Trauma radiography
  1. ER radiography
- D. Cross table lateral studies
  1. Body part, tube alignment
- E. Foreign body localization

**IV. Radiographic Positioning Applications for the Mobile and C-Arm Radiography (4 hours, lab)**

- A. Portable radiography
  1. AP Chest
  2. Ortho
- B. Surgical radiography
  1. C-Arm usage
- C. Trauma radiography
  1. ER radiography
- D. Cross table lateral studies
  1. Body part, tube alignment
- E. Foreign body localization

**V. Radiographic Preparation for Contrast Studies (3 hours, lecture)**

- A. Patient preparation for contrast studies
  1. Patient history
  2. Bowel cleanse
  3. Labs
- B. Contrast media
  1. Types, safe use, and hazards
  2. Indications and contraindications
  3. Adverse reactions
- C. Medical intervention

**VI. Radiographic Positioning Applications for Fluoroscopic Procedures Using Contrast Media (10 hours, lecture)**

- A. Fluoroscopic procedures using contrast media
  1. Gastrointestinal system
    - a. Single and double contrast studies
  2. Esophogram
  3. Upper gastrointestinal
  4. Small bowel series
  5. Enterocolysis
  6. Barium and gastrografin enemas

- B. Biliary system
  - 1. T-tube cholangiogram
  - 2. Cholecystogram
  - 3. Endoscopic retrograde
  - 4. Cholangiopancreatography (ERCP)
  - 5. Operative cholangiogram
- C. Genitourinary
  - 1. Cystography and cystourethrography
  - 2. Intravenous urography
  - 3. Retrograde pyelography

**VII. Radiographic Positioning Applications for Fluoroscopic Procedures Using Contrast Media (18 hours, lab)**

- A. Fluoroscopic procedures using contrast media
  - 1. Fluoroscope procedures using contrast media
    - a. Single and double contrast studies
  - 2. Esophogram
  - 3. Upper gastrointestinal
  - 4. Small bowel series
  - 5. Enterocolysis studies
  - 6. Barium and gastrografin enemas
- B. Biliary system
  - 1. T-tube cholangiogram
  - 2. Cholecystogram
  - 3. Endoscopic retrograde
  - 4. Cholangiopancreatography (ERCP)
  - 5. Operative cholangiogram
- C. Genitourinary
  - 1. Cystography, cystourethrography
  - 2. Intravenous urography
  - 3. Retrograde pyelography

**VIII. Radiographic Positioning Applications for Age Specific Patients (6 hours, lecture)**

- A. Pediatric radiography
  - 1. Under age 6
  - 2. Under age 12
  - 3. Under age 18
- B. Geriatric radiography
  - 1. Over age 66
- C. Special needs patients

**IX. Simulated Radiographic Positioning Application for Age Specific Patients (3 hours, lab)**

- A. Pediatric radiography
  - 1. Under age 6
  - 2. Under age 12
  - 3. Under age 18
- B. Geriatric radiography
  - 1. Over age 66
- C. Special needs patients

**Total Lecture Hours:** 54

<b>Total Laboratory Hours:</b>	54
<b>Total Hours:</b>	108
<b>Primary Method of Evaluation:</b>	3) Skills demonstration
<b>Typical Assignment Using Primary Method of Evaluation:</b>	Demonstrate proper patient positioning and use of radiographic equipment in the performance of a trauma hip examination.
<b>Critical Thinking Assignment 1:</b>	Given three examples of radiographic images of the lumbar spine, compare and analyze the radiographs for correct positioning, technical quality, diagnostic value and differences or similarities of anatomy and pathology. Select one of the radiographic examples that demonstrates improper positioning and poor technical quality. Evaluate the image and write a one-page critique describing why the image is sub-standard. Explain what corrections in technique and positioning would be necessary to improve the radiographic image.
<b>Critical Thinking Assignment 2:</b>	Given a role-play activity with your lab partner acting as a patient who was in a motor vehicle accident (MVA) and has sustained multiple fractures, a head injury and loss of consciousness, demonstrate the alternative positioning methods that may be used to produce a diagnostic and safe radiographic examination of the chest, cervical spine, pelvis and right femur. In a one-page summary, list in order of importance, which exams and projections should be performed first and state why this is an important consideration with trauma patients.
<b>Other Evaluation Methods:</b>	Class Performance, Completion, Embedded Questions, Homework Problems, Laboratory Reports, Matching Items, Multiple Choice, Objective Exam, Other Exams, Performance Exams, Presentation, Quizzes, Reading Reports, Written Homework
<b>Instructional Methods:</b>	Demonstration, Discussion, Group Activities, Lab, Lecture, Multimedia presentations
<b>If other:</b>	Radiographic Image critique
<b>Work Outside of Class:</b>	Answer questions, Observation of or participation in an activity related to course content (such as theatre event, museum, concert, debate, meeting), Problem solving activity, Required reading, Skill practice, Study, Written work (such as essay/composition/report/analysis/research)
<b>If Other:</b>	
<b>Up-To-Date Representative Texts:</b>	<b><u>Merrill's Radiographic Positioning &amp; Procedures</u></b> (VOL 1& 2) Long et al, 15 <sup>th</sup> Ed. Elsevier 2022 Workbook: <u>Radiographic Anatomy, Positioning &amp; Procedures Workbook</u> Long et al 15 <sup>th</sup> Ed. Elsevier 2022
<b>Alternative Texts:</b>	Kenneth Bontrager. RADIOGRAPHIC ANATOMY AND POSITIONING WORKBOOK, VOLUMES I and II, C.V. Mosby Company Publishers, 2020 Adler and Carlton. INTRODUCTION TO RADIOGRAPHY AND PATIENT CARE, WB Saunders Publisher, 2023 McQuillen and Martensen. RADIOGRAPHIC CRITIQUE, 5th ed, Elsevier Mosby Publications, 2021
<b>Required Supplementary Readings:</b>	
<b>Other Required Materials:</b>	
<b>Requisite:</b>	Prerequisite

<b>Category:</b>	sequential
<b>Requisite course(s): List both prerequisites and corequisites in this box.</b>	<p><b>Prerequisite</b> Radiologic Technology-106 AND Radiologic Technology-111 AND Radiologic Technology-123</p> <p><b>Corequisite:</b> Radiologic Technology-107</p>
<b>Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).</b>	<p><b>Knowledge of radiation safety and protection for the patient and operator.</b>  RTEC 107 - Demonstrate knowledge of radiation protection and application principles of patients, self and staff.  RTEC 107 - Demonstrate the proper use of protective devices for patient safety during the radiographic procedures.  RTEC 111 - Demonstrate the proper use of radiographic equipment and accessory items to produce high quality radiographs such as; darkroom processing, computerized processing, image display, and radiation protection techniques. Compare and contrast how proper use of these devices and processing can influence the outcome image and patient dose.  RTEC 111 - Demonstrate the proper use of radiographic equipment and accessory items to produce high quality radiographs such as; darkroom processing, computerized processing, image display, and radiation protection techniques. Compare and contrast how proper use of these devices and processing can influence the outcome image and patient dose.</p> <p><b>Knowledge of radiographic techniques and controlling factors.</b>  RTEC 111 - Describe the physical concepts of energy and the basic structure of matter, the principles of x-ray production, the relationship of x-ray photon interaction with matter and the effects of radiation exposure produced in humans. Formulate appropriate radiographic exposure factors and select correct factors on an x-ray machine control panel to produce radiographic images using radiographic phantoms.  RTEC 111 - Describe the physical concepts of energy and the basic structure of matter, the principles of x-ray production, the relationship of x-ray photon interaction with matter and the effects of radiation exposure produced in humans. Formulate appropriate radiographic exposure factors and select correct factors on an x-ray machine control panel to produce radiographic images using radiographic phantoms.  RTEC 107 - Establish and set appropriate exposure factors on a machine control panel for a specific procedure.  RTEC 107 - Set control panel with appropriate technical factors under direct supervision.</p> <p><b>Ability to properly manipulate basic radiographic equipment.</b>  RTEC 107 - Assess the operational characteristics of the radiographic equipment and accessories for each examining area.  RTEC 107 - Establish and set appropriate exposure factors on a machine control panel for a specific procedure.  RTEC 123 - Demonstrate the proper use of radiographic equipment and perform radiographic procedures using the energized laboratory and phantoms.</p> <p><b>Ability to perform radiographic examinations of the upper extremity, lower extremity, and routine chest radiography.</b>  RTEC 123 - Demonstrate technical competence and prudent judgment and the proper use of protective devices while administering ionizing radiation to perform diagnostic imaging procedures of the Chest, Upper and Lower extremities, to meet acceptable patient care standards.</p>
<b>Requisite Skill:</b>	

<b>Requisite Skill and Matching Skill(s): Bold the requisite skill(s). If applicable</b>	
<b>Requisite course:</b>	
<b>Requisite and Matching skill(s):Bold the requisite skill. List the corresponding course objective under each skill(s).</b>	
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<b>Enrollment Limitations and Category:</b>	
<b>Enrollment Limitations Impact:</b>	
<b>Course Created by:</b>	Dawn Charman
<b>Date:</b>	03/01/2006
<b>Original Board Approval Date:</b>	05/15/2006
<b>Last Reviewed and/or Revised by:</b>	Dawn Charman
<b>Date:</b>	02/14/2024
<b>Last Board Approval Date:</b>	05/20/2024
<b>Effective Term:</b>	FALL 2025