



RAD-515: RADIOGRAPHIC POSITIONING I

Effective Term

Fall 2025

BOT Approval Date

11/14/2024

Discipline

RAD - Radiologic Technology

Course Number

515

Course Title

Radiographic Positioning I

Short Title

RAD Positioning I

Credit Status (CB 04)

D - Credit - Degree applicable

Units

Lecture Units

3.00

Lab Units

1.00

Total Units

4.00

Hours

Lecture Contact Hours

48-54

Out of Class Hours Lecture

96-108

Lab Contact Hours

48-54

Out of Class Hours Lab

0.00

Total Contact Hours

96 - 108

Total Out of Class Hours

96 - 108

Total Student Learning Hours

192 - 216

Is this an existing Extensive Lab?

Yes

**Distance Education**

No

Catalog Description

This course offers positioning methods for the upper and lower extremities, respiratory system, bony thorax, and abdomen along with practical applications of image evaluation and radiation protection.

Attach Supporting Documents

JRCERT 2021 Radiography Standards pg 28.pdf

ASRT 2022 radiography curriculum guide.pdf

Requisites**Prerequisite(s)****Prerequisite(s) (must be taken before)**

Acceptance to the Radiologic Technology program.

Codes**TOP Code (CB 03)**

1225.00* - *Radiologic Technology

CIP Code

51.0911 - Radiologic Technology/Science - Radiographer.

Repeatability Code

No

Grading Option

Letter grade OR P/NP

Learning Objectives**Learning Objectives****Learning Objective**

1. List and explain the routine and special views for the radiographic procedures of the upper and lower extremities, respiratory system, bony thorax, and abdomen.
2. Analyze immobilization techniques for various types of procedures and patient conditions.
3. Organize the information to be collected from the patient prior to the radiographic examination.
4. Evaluate general considerations for selected radiographic procedures.
5. Simulate radiographic procedures on a person or phantom in a laboratory setting using appropriate body mechanics and applying quality patient care techniques.
6. Evaluate images for positioning, centering, appropriate anatomy and overall image quality.
7. Demonstrate general and positioning considerations involved with selected radiographic procedures.
8. Combine methods of radiation protection for the radiographer and patient for each radiographic procedure with considerations for patients with different gender, culture, race, and disabilities.
9. Adapt variations of radiographic procedures based on special considerations presented by the patient.
10. Prepare the patient, through role playing with other students, for a radiographic exam. Preparation includes approaches to patients with different gender, culture, race, and disabilities.

Learning Outcome Information

Course Learning Outcomes

Learning Outcome

1. Students will properly role play a radiographic imaging procedure of an upper extremity body part to include proper communication, radiation protection, critical thinking skills, and patient care skills on patients that may have different genders, cultures, race, and disabilities.
2. Students will properly role play a radiographic imaging procedure of an lower extremity body part to include proper communication, radiation protection, critical thinking skills, and patient care skills on patients that may have different genders, cultures, race, and disabilities.
3. Students will properly role play a radiographic imaging procedure of the thorax to include proper communication, radiation protection, critical thinking skills, and patient care skills on patients that may have different genders, cultures, race, and disabilities.

Program Learning Outcomes

Learning Outcome

- Apply positioning skills in all required radiographic examinations.
- Practice radiation protection for all radiographic examinations.
- Employ proper patient care techniques and effectively provide care for patients from diverse groups/populations.
- Demonstrate oral and written communication skills.
- Relate to and anticipate the needs of the doctors and technologists.
- Adjust to changes, situations, patient conditions, updated evidence-based practice, and deviation from the normal routine.
- Demonstrate knowledge of ethical requirements for an entry level radiographer along with ethical practices in a healthcare setting.
- Understand professional obligations upon gaining the ARRT status.

Institutional Learning Outcomes

Aesthetic Awareness: The student will identify and evaluate how aesthetic expression leads to an appreciation of social and cultural context as well as the values of art and nature.

Communication: The student will effectively express and exchange ideas through listening, speaking, reading, writing, visual works, and other modes of interpersonal expression.

Critical Thinking: The student will analyze problems, gather and synthesize relevant information, evaluate ideas, information, and evaluate alternative points of view to create, innovate and implement effective solutions.

Cultural Awareness and Humility: The student will demonstrate knowledge of and sensitivity toward individuals of diverse ethnicity, age, gender, sexual orientation, and religious affiliations, as well as toward those individuals with diverse abilities and socio-economic classes to respectfully interact with individuals of diverse perspectives, beliefs and values while being mindful of the limitation of their own cultural frameworks.

Information and Technology Literacy: The student will access, interpret, evaluate, and apply relevant information sources and digital media effectively, and in an ethical and legal manner.

Scientific Awareness: The student will apply the scientific method of inquiry to assess potential solutions for real-life challenges by employing science-based knowledge and methodologies in daily life.

Social Awareness: The student will recognize and analyze the interconnectedness of global, national, and local concerns, analyzing cultural, political, social, and environmental issues from multiple perspectives and appreciate similarities and differences among cultures.

Civic

Personal

and Professional Responsibility

Content

Course Lecture Content

1. Introduction to Radiographic Procedures
 - a. Positioning Nomenclature
 - b. Standard Terms
 - i. View
 - ii. Position
 - iii. Projection
 - c. Terms of position

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- i. Erect
 - ii. Recumbent
 - iii. Supine
 - iv. Prone
 - v. Trendelenburg
 - vi. Decubitus
 - vii. Anterior
 - viii. Posterior
 - ix. Oblique
 - d. General Plane
 - i. Sagittal and mid-sagittal
 - ii. Coronal and mid-coronal
 - iii. Transverse
 - iv. Longitudinal
 - e. Terminology of movement and direction
 - i. cephalad/caudad
 - ii. Inferior/superior
 - iii. Proximal/distal
 - iv. Plantar/palmar
 - v. Pronate/supinate
 - vi. Flexion/extension
 - vii. Abduction/adduction
 - viii. Inversion/eversion
 - ix. Medial/lateral
 - f. Positioning Aids
 - i. Sponges
 - ii. Sandbags
 - iii. Compression bands
 - iv. Immobilization devices
 - g. Accessory Equipment
 - i. Calipers
 - ii. Lead Strips
 - iii. Lead aprons/gloves
 - iv. Gonadal shields
 - v. Shadow shields
 - vi. Lead Markers
 - 2. Evaluation of Radiographic orders
 - 3. Patient identification
 - a. Verification of procedure(s) ordered
 - i. requisition interpretations
 - ii. medical reports
 - b. Review of clinical history
 - c. Taking clinical history and patient assessment
 - i. Role of radiographer
 - ii. Questioning skills
 - iii. Determining the chief complaint
 - iv. Localization
 - v. Chronology
 - vi. Quality
 - vii. Severity
 - viii. Onset
 - ix. Aggravating or alleviating factors
 - x. Associated manifestations
 - xi. Special considerations for age, disability, and cultural background
 - xii. Determination of allergies

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4. Establishing Patient Rapport
 - a. Patient status evaluation
 - i. Cooperation/uncooperative
 - ii. Trauma
 - iii. Geriatric
 - iv. Other
 - b. Explain procedures
 5. Patient Pregnancy
 6. Patient Preparation
 - a. Dietary
 - b. Medication
 - c. Disrobing
 - d. Potential artifacts
 - e. Other
 7. Room Preparation
 - a. Appearance/cleanliness
 - b. Necessary supplies and accessory equipment available
 - c. Other
 8. Patient Assistance
 9. Patient Monitoring
 - a. Infants/children
 - b. Adults
 10. Image evaluation
 11. Post exam instructions
 12. Patient Education
 - a. Communication
 - i. Types
 - ii. Barriers
 - b. Clinical situations
 - c. Common radiation safety issues and concerns
 13. Positioning Considerations for Routine Radiographic Procedures
 - a. Patient communication for different gender, race, culture, and disabilities
 - b. Patient Positioning
 - c. Part Placement
 - d. Image receptor selection and placement
 - e. Beam alignment and angle
 - f. Beam limitation and shielding
 - g. Special Considerations
 - i. Atypical conditions
 - ii. Mobile procedures
 - iii. Age specific
 - iv. Special needs patients
 - v. Gender, race, culture, and disabilities
 - h. Positioning for the following studies:
 - i. Upper extremities
 - ii. Lower extremity
 - iii. Respiratory system
 - iv. Abdomen
 - v. Bony Thorax
 14. Radiographic Pathology
 - a. Pathology definitions and terminology
 - b. Classifications of definitions, examples, sites, complications, and prognosis
 - c. Causes of disease processes and examples.
 - d. Radiologic pathology

- i. Skeletal and articular
- ii. Respiratory
- iii. Urinary

Course Lab Content

1. Phantom imaging of selected radiographic images of the upper and lower extremities, respiratory system, bony thorax, and abdomen
 - a. Part placement
 - b. Image receptor selection and placement
 - c. Beam alignment and angle
 - d. Beam limitation and shielding
2. Role play scenarios for positions for selected radiographic procedures of the upper and lower extremities, respiratory system, bony thorax, and abdomen
 - a. Patient communication for different gender, race, culture, and disabilities
 - b. Patient positioning
 - c. Part placement
 - d. Image receptor selection and placement
 - e. Beam alignment and angle
 - f. Beam limitation and shielding
3. Selection of technical factors
 - a. Milliampere
 - b. Time
 - c. Kilovoltage
 - d. Focal spot size
4. Radiation protection practices
 - a. Collimation
 - b. Gonadal shielding
 - c. Technical factors
5. Special Considerations
 - a. Atypical conditions
 - b. Mobile procedures
 - c. Age specific
 - d. Special needs patients
 - e. Gender, race, culture, and disabilities
6. Radiographic critique
 - a. Position
 - b. Anatomy
 - c. Technical factors
 - d. Beam limitation
 - e. Central ray position
 - f. Image criteria
7. Image anatomy labeling
 - a. Upper extremities
 - b. Lower extremities
 - c. Respiratory system
 - d. Bony thorax
 - e. Abdomen

Methods of Instruction

Method

Lecture

Integration

Lecture and demonstration will be used to present information about the proper positions for patient imaging of the bony thorax, chest, abdomen, and extremities while emphasizing the crucial aspects of patient care and communication, with a particular focus on considerations related to gender, race, culture, and disabilities.

Method

Reading

Integration

Reading assignments from the textbook, Radiographic Positioning and Related Anatomy, Chapters 1-7 will be completed by the students. These assignments will be followed with a classroom discussion to help develop the critical thinking skills necessary for a radiographer to produce a high quality radiographic images of the extremities, chest, and abdomen, based on patient conditions.

Method

Film/video Viewing and Discussion

Integration

In order to enhance students' understanding of patient positioning in radiography, video presentations will be presented illustrating proper imaging techniques. These videos, available on YouTube, offer comprehensive step-by-step guidance for imaging patients in a radiography room setting. As an illustrative example, there is a 48-minute video titled "Essential Radiography of the Upper Extremity." These instructional videos aim to provide students with a realistic preview of what to expect during their clinical training when they begin imaging actual patients. Following the video presentations, students will engage in an instructor guided discussion addressing the challenges radiographers may encounter when imaging a diverse range of patients.

Method

Lab Activities

Integration

Students will actively engage in the process of positioning and imaging x-ray phantoms in a laboratory setting. This hands-on approach aims to cultivate their proficiency as radiographers while emphasizing the essential aspects of patient care and communication, especially tailored to effectively serve a diverse patient population. The students will utilize the provided phantoms to practice their techniques in various anatomical regions, including the bony thorax, chest, abdomen, and extremities, which are fundamental to their professional development. Throughout this learning experience, students will also learn and apply patient care and communication techniques, ensuring they are well-prepared to interact with and provide quality care to patients from diverse backgrounds.

Method

Role Playing/Simulation

Integration

Students will engage in simulated role-playing scenarios within the laboratory environment. These exercises will include competency evaluations, which will gauge students' proficiency in correctly positioning a "patient" for a radiographic examination, as well as their effectiveness in communicating with patients from diverse backgrounds, including different genders, races, cultures, and individuals with disabilities. Furthermore, students will be assessed on their application of proper radiation protection measures, demonstrating the use of appropriate patient care skills throughout these exercises. Role playing scenarios will include imaging of the chest, abdomen, and extremities.

Methods of Evaluation**Method**

Exams/Tests

Integration

Exams and tests will be used to measure knowledge of radiographic positioning of the upper and lower extremities, respiratory system, bony thorax, and abdomen. Exams will be given to measure student understanding of the subject matter and the ability to

analyze proper patient positioning. The exams will be multiple choice to help prepare the students to pass the American Registry of Radiologic Technologists exam which is also multiple choice and graded for accuracy.

Method

Role-playing/Simulation

Integration

Competency evaluations on the chest, abdomen, and extremity exams will assess the student's ability to properly position a "patient" for a radiographic exam along with effective communication for patients of different gender, culture, race, and disabilities, applying proper radiation protection, and using appropriate patient care skills. Evaluations use a skills checklist and students are graded on accuracy of positioning and techniques along with appropriate patient care skills and communication.

Method

Projects

Integration

Students will complete lab assignments that pertain to the radiographic imaging of phantoms using proper radiation protection practices. Each lab assignment will be graded to determine the student's understanding of part positioning, anatomy presented, exposure techniques used, and proper image criteria. Lab assignments include chest, abdomen, and extremity exams.

Assignments**Assignment Type**

Writing

In-class and/or outside of class

In-class

Formative or Summative

Summative

Assignment

Complete weekly laboratory assignments focused on radiographic procedures for the upper and lower extremities, respiratory system, bony thorax, and abdomen. You will capture radiographic images of a phantom in various positions and apply your knowledge by accurately labeling the anatomical structures visible in these images using the provided anatomy list.

Furthermore, you will critically analyze radiographic images provided by the instructor, assessing them for proper positioning, anatomical depiction, technical factors, collimation, and identification of any potential pathology. If technical factors are found to be inadequate, you will also identify corrective measures for future images.

Lab assignments will be assessed based on the criteria of completeness and accuracy, ensuring a comprehensive understanding of radiographic procedures and techniques.

Assignment Type

Reading

In-class and/or outside of class

Outside of class

Formative or Summative

Formative

Assignment

Read chapters 1-7 in the required course textbook by J. Lampignano, which covers topics related to upper and lower extremities, respiratory system, bony thorax, and abdomen.

Preparation: For each of the assigned chapters, prepare a summary that includes the following details:

Radiographic positions covered in the chapter.

Part position (how the patient should be positioned), including any variations.

Degree of rotation (if applicable).

Tube angulation (if applicable).

Central ray position.

Patient instructions and considerations, with a focus on cultural sensitivity and diversity (e.g., consider how gender, race, culture, and disabilities might impact patient care and instructions).

Appropriate collimation techniques.

Anatomical structures visible in each position.

Image evaluation criteria (what to look for in a correctly positioned image).

Class Discussion: Be prepared to actively participate in class discussions for each chapter. During these discussions, we will explore the radiographic positions and anatomy covered in the assigned chapters. You will share your summaries and engage in a collaborative learning environment.

Questions and Clarifications: Feel free to bring any questions or seek clarifications during the class discussion. This is an opportunity to deepen your understanding of radiographic positioning and anatomy.

Grading Criteria:

Active participation in class discussions.

Quality and completeness of the prepared summaries for each chapter.

Demonstrated understanding of radiographic positions, anatomy, and related concepts.

This assignment is designed to enhance your comprehension of radiographic positioning and anatomy, which are crucial skills for a radiographer. Engage actively in the discussions to maximize your learning experience.

Assignment Type

Other

In-class and/or outside of class

In-class

Formative or Summative

Formative

Assignment

Engage in role-playing exercises and simulations to practice radiographic positioning techniques for various anatomical areas, including the upper and lower extremities, respiratory system, bony thorax, and abdomen.

Role-playing scenarios encompass comprehensive steps, such as patient introductions, confirming patient identification, preparing the patient for the procedure, gathering patient history, positioning the patient correctly, manipulation of the x-ray equipment, offering clear instructions, and completing the examination.

You will perform a total of 3 competency evaluations will be performed throughout the semester. These competency evaluations will be of the upper extremity, lower extremity, and the final one to include the chest and abdomen combined.

Assessment of competency is based on a skills checklist that include the accuracy of positioning, communication, radiation protection techniques, and equipment manipulation. This checklist is provided in the lab manual. Also included in the assessment is the capacity to sensitively consider factors such as gender, culture, race, and disabilities when communicating with patients during these simulations.

Course Materials

Textbooks

Lampignano, John (2024), Bontrager's Textbook of Radiographic Positioning and Related Anatomy, 11th Ed., Elsevier. ISBN#: 9780323936132

Class Size Information

Class Size

32

Class Size Category

G - Large lab 32

Diversity and Inclusion

Explain how diversity and inclusion(e.g., gender, culture/race, sexuality, etc.) is infused into the course.

In the lab, students engage in role-playing exercises of the upper and lower extremities, chest, bony thorax, and abdomen to simulate imaging procedures on patients. The importance of effective communication becomes evident when obtaining patient histories and delivering examination instructions. During these simulations, students are mindful of various factors, including gender, culture, race, and disabilities, which are crucial in their interactions with patients. These interactions foster knowledge, empathy, and patient advocacy in developing future healthcare professionals.

While students receive instruction on proper patient care and communication during these role-playing scenarios, they also actively participate in these exercises with their peers. These small lab groups offer a valuable opportunity for students to collaborate with their classmates in performing these simulations, fostering camaraderie among themselves.

Describe how assignments, instruction, evaluation, course content, and interactions are contextualized for diverse learners promoting an equitable course.

The course offers a variety of resources designed to accommodate diverse learning preferences among students. For audio learners, in-class instructor lectures are available. Visual learners can make use of instructor-led PowerPoint presentations, required textbook readings covering positioning procedures, and lab demonstrations illustrating various phantom positions of the chest, abdomen, and extremity exams. Hands-on learners will have the opportunity to actively engage in the lab, where they will physically position fellow students simulating patients and operate radiographic equipment to capture actual radiographs.

Interactions

Explain how the course will incorporate student-to-student interaction.

This course incorporates a hands-on laboratory component, enriching classroom discussions with interactive learning experiences. In the lab, students engage in simulations, often working in pairs or groups to actively participate in patient positioning scenarios. These scenarios encompass a range of anatomical areas, including the upper and lower extremities, bony thorax, chest, and abdomen, fostering dynamic discussions and interactions among students. Additionally, students are encouraged to engage in collaborative teamwork as they collectively work on lab positioning assignments.

Explain how the course will incorporate instructor-to-student interaction.

Instructors interact through face to face lectures where students may ask questions about upper and lower extremities, respiratory system, bony thorax, and abdomen positioning. The instructor will work directly with the student in the lab setting to help the student to develop positioning skills along with communication for a diverse group of patients. Instructor uses real-life experience stories during lectures to enhance student learning.

Explain how the course will incorporate student-to-content interaction.

This course features a comprehensive textbook that serves as a valuable reference for students in the context of positioning the upper and lower extremities, respiratory system, bony thorax, and abdomen. In their studies, students explore the textbook content, engage with PowerPoint lectures, and participate in practical exercises within the positioning lab.

Within the lab setting, students are given the chance to immerse themselves in hands-on experiences, which involve role-playing various positions and manipulating radiographic equipment to capture the desired images. This practical, hands-on approach complements the textbook material, contributing to a deeper and more comprehensive understanding of the subject matter.

Explain how the course will incorporate student-to-self interaction (metacognitive).

This course offers students the chance to examine methods for producing high-quality radiographic images of the upper and lower extremities, respiratory system, bony thorax, and abdomen. Emphasis is placed on achieving optimal positioning while minimizing radiation exposure, ensuring both patient and self-safety, and facilitating accurate diagnostic interpretation by radiologists.

Through this course, students will build confidence in their ability to prepare for real-world imaging scenarios in a hospital training environment. Additionally, they will develop valuable insights into effectively communicating with patients from diverse backgrounds, encompassing various races, cultures, ethnicities, and those with disabilities.

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