COURSE OUTLINE

Course Number: RAD127
Course Title: Radiographic Procedures I
Credits: 6

Lecture Hours: 3
Prerequisites: Proficiency in Basic Algebra & Basic English

Laboratory Hours: 3
Co-Requisites: RAD107, RAD119, BIO103, MAT__ Elective

Clinical Days: 24

Catalog Description (2017-2018):

Study of standard radiographic positioning and related medical terminology of the chest, abdomen, upper and lower extremities. Involves laboratory simulation and evaluation. Students acquire clinical experiences at an affiliate hospital sufficient to demonstrate competency in a specified number and variety of radiographic procedures. (Fall 2017).

Required Texts/Other Materials:

Title: Textbook of Radiographic Positioning and Related Anatomy
Author: K.L. Bontrager; J.P. Lampignano
Publisher: Elsevier Mosby
Edition: 9th

Title: Radiographic Positioning and Related Anatomy Workbook, Volume I
Author: K.L. Bontrager; J.P. Lampignano
Publisher: Elsevier Mosby
Edition: 9th

Title: Radiographic Image Analysis
Author: Kathy McQuillen Martensen
Publisher: Mosby
Edition: 4th

Title: Radiographic Image Analysis Workbook
Author: Kathy McQuillen Martensen
Publisher: Mosby
Edition: 4th

Title: Bontrager’s Handbook of Radiographic Positioning & Techniques
Author: K.L. Bontrager; J.P. Lamignano
Publisher: Elsevier Mosby
Edition: 9th
**Statement of Course Relevance as Required under the Federal Carl D. Perkins Grant:**

As the first of three procedures-related courses, students will become acquainted with the instrumentation and equipment specific to radiography. They will also learn fundamental positioning terminology, general rules for obtaining the appropriate number and type of radiographic positions, and the most common positions of the upper and lower extremity, chest and abdomen. Students will use radiographic equipment in the laboratory to perform procedures under simulated conditions. The knowledge and skill acquired this semester will serve as the basis for continued learning and training in subsequent semesters. Skills are soon applied in the clinical setting, where -- under appropriate supervision – students perform similar procedures on patients. Upon completion of the entire Program curriculum, graduates should have demonstrable competency in radiographic procedures sufficient to obtain entry-level employment as diagnostic radiologic technologists (radiographers).

**Course Competencies/Goals (Student Learning Outcomes):**

At the completion of the course, the student should be able to:

1. Define the medical terms that apply to the upper and lower extremities, chest and abdomen.

2. Efficiently perform the routine radiographic positions applicable to the upper and lower extremities, chest and abdomen under simulated conditions in the laboratory utilizing radiographic equipment and accessories as needed.

3. Evaluate radiographs to determine acceptability of radiographic positioning and identify anatomical structures.

4. Describe accessory devices utilized and demonstrate appropriate use.

5. Identify the radiology department protocols as they relate to radiographic procedures.

6. Communicate effectively during laboratory simulation of radiographic procedures.

7. Successfully complete initial competency evaluations involving three (3) radiographic procedures on patients in the clinical setting.*

*Students who demonstrate competency in any procedure may perform that procedure with indirect supervision. This means that the licensed radiographer need not be present in the radiographic room during the procedure, but must be adjacent to the room and immediately available should the student require assistance.
Any student who produces an unacceptable image that requires a retake must have it performed with direct supervision regardless of that student’s level of competency. Failure to comply with this rule will subject the student to disciplinary action.

Course-specific General Education Goals and Core Skills (Student Learning Outcomes, Continued):

General Education Knowledge Goals:

- **Goal 1. Communication.** Students will communicate effectively in both speech and writing.

- **Goal 2. Mathematics.** Students will use appropriate mathematical and statistical concepts and operations to interpret data and to solve problems.

- **Goal 3. Science.** Students will use the scientific method of inquiry, through the acquisition of scientific knowledge.

- **Goal 4. Technology.** Students will use computer systems or other appropriate forms of technology to achieve educational and personal goals.

- **Goal 5. Social Science.** Students will use social science theories and concepts to analyze human behavior and social and political institutions and to act as responsible citizens.

- **Goal 8. Diversity.** Students will understand the importance of a global perspective and culturally diverse peoples.

- **Goal 9. Ethical Reasoning and Action.** Students will understand ethical issues and situations.

MCCC Core Skills

- **Goal A. Written and Oral Communication in English.** Students will communicate effectively in speech and writing, and demonstrate proficiency in reading.

- **Goal B. Critical Thinking and Problem-solving.** Students will use critical thinking and problem solving skills in analyzing information.

- **Goal C. Ethical Decision-Making.** Students will recognize, analyze and assess ethical issues and situations.

- **Goal D. Information Literacy.** Students will recognize when information is needed and have the knowledge and skills to locate, evaluate, and effectively use information for college level work.

- **Goal E. Computer Literacy.** Students will use computers to access, analyze or present information, solve problems, and communicate with others.
• **Goal F. Collaboration and Cooperation.** Students will develop the interpersonal skills required for effective performance in group situations.

• **Goal G. Intra-Cultural and Inter-Cultural Responsibility.** Students will demonstrate an awareness of the responsibilities of intelligent citizenship in a diverse and pluralistic society, and will demonstrate cultural, global, and environmental awareness.

**Units of Study in Detail:**

At the completion of each weekly three-component activity (lecture, laboratory, clinical education the student will be able to:

• Exercise the priorities required in daily clinical practice. (GE 1, A)
• Execute medical imaging procedures under the appropriate level of supervision. (GE 9, C)
• Adhere to team practice concepts that focus on organizational theories, roles of team members and conflict resolution. (GE F)
• Adapt to changes and varying clinical situations. (GE B)
• Provide patient-centered clinically effective care for all patients regardless of age, gender, disability, special needs, ethnicity or culture. (GE 8, G)
• Integrate the use of appropriate and effective written, oral and nonverbal communication with patients, the public and members of the health care team in the clinical setting. (GE 1, A)
• Integrate appropriate personal and professional values into clinical practice. (GE 9, C)
• Recognize the influence of professional values on patient care. (GE 8, Goal C)
• Explain how a person’s cultural beliefs toward illness and health affect his or her health status. (GE 8, C)
• Use patient and family education strategies appropriate to the comprehension level of the patient/family. (GE 1, A)
• Provide desired psychosocial support to the patient and family. (GE 5)
• Demonstrate competent assessment skills through effective management of the patient’s physical and mental status. (GE 1, A)
• Respond appropriately to medical emergencies. (GE 1, A, F)
• Examine demographic factors that influence patient compliance with medical care. (GE 8, C)
• Adapt procedures to meet age-specific, disease-specific and cultural needs of patients. (GE 8, C)
• Assess the patient and record clinical history. (GE 1, A)
• Demonstrate basic life support procedures.
• Use appropriate charting methods. (GE 1, A)
• Apply standard and transmission-based precautions.
• Apply the appropriate medical asepsis and sterile technique.
• Demonstrate competency in the principles of radiation protection standards
• Examine procedure orders for accuracy and take corrective actions when applicable.
• Demonstrate safe, ethical and legal practices. (GE 1, 9, A-C)
• Integrate the radiographer’s practice standards into clinical practice setting. (GE 8, C)
• Maintain patient confidentiality standards and meet HIPAA requirements.
• Demonstrate the principles of transferring, positioning and immobilizing patients.
• Comply with departmental and institutional response to emergencies, disasters and accidents. (GE 1, A, F)
• Differentiate between emergency and non-emergency procedures.
• Adhere to national, institutional and departmental standards, policies and procedures regarding care of patients, providing radiologic procedures and reducing medical errors.
• Select technical factors to produce quality diagnostic images with the lowest radiation exposure possible.
• Critique images for appropriate anatomy, image quality and patient identification. (GE 4, B, E)
• Determine corrective measures to improve inadequate images. (GE B)

Note: All objectives listed above satisfy the course Goals/Competencies identified on page 2 of this Course Outline)

**Topical Outline:**

The general plan for the fifteen-week semester identifies the topics and procedures to be discussed and simulated in the laboratory:

<table>
<thead>
<tr>
<th>Week #</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to X-ray Laboratory Equipment <em>(Monday of Week #2: Holiday)</em></td>
</tr>
<tr>
<td>3</td>
<td>Positioning Terminology/Radiography of the Digits (Fingers &amp; Thumb</td>
</tr>
<tr>
<td>4</td>
<td>Radiography of the Hand and Wrist</td>
</tr>
<tr>
<td>5</td>
<td>Radiography of the Forearm, Elbow and Humerus</td>
</tr>
<tr>
<td>6</td>
<td>Radiography of the Shoulder Girdle, Part I</td>
</tr>
<tr>
<td>7</td>
<td>Radiography of the Shoulder Girdle, Part II</td>
</tr>
<tr>
<td>8</td>
<td>Radiography of the Toes and Feet (without shoes and socks)</td>
</tr>
<tr>
<td>9</td>
<td>Midterm Examination</td>
</tr>
<tr>
<td>10</td>
<td>Radiography of the Ankle and Calcaneus (without shoes and socks)</td>
</tr>
<tr>
<td>11</td>
<td>Radiography of the Tibia/Fibula and Knee</td>
</tr>
<tr>
<td>12</td>
<td>Radiography of the Intercondylar Fossa and Knee</td>
</tr>
<tr>
<td>13</td>
<td>Radiography of the Chest</td>
</tr>
</tbody>
</table>
Radiography of the Abdomen
Radiography of the Abdomen
### Tentative Lecture & Laboratory Schedule:

<table>
<thead>
<tr>
<th>SEMESTER WEEK</th>
<th>TOPIC</th>
<th>READING ASSIGNMENT (BONTRAGER)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Introduction/Equipment</strong></td>
<td>On-line Handouts</td>
</tr>
</tbody>
</table>
| 2             | **LABOR DAY -- NO CLASS Monday;**  
               | Wednesday: Equipment/Patient Communication | On-Line Handouts               |
| 3             | Positioning Terminology  
               | Radiography of the Digits | pp.15-29; 128-129; 142-149; ARRT handout |
| 4             | **Test #1: Terminology & Digits**  
               | Radiography of the Hand & Wrist | Chapter 4                      |
| 5             | **Test #2: Hand & Wrist**  
               | Radiography of the Forearm, Elbow and Humerus | Chapter 4, 5                   |
| 6             | **Test #3: Forearm, Elbow and Humerus**  
               | Radiography of the Shoulder Girdle | Chapter 5                      |
| 7             | **Test #4: Shoulder Girdle**  
               | Radiography of the Shoulder Girdle, part II | Chapter 5                      |
| 8             | **Test #5: Shoulder Girdle, part II**  
               | Radiography of the Toes and Feet | Chapter 6                      |
| 9             | **Comprehensive Midterm Examination (including Toes and Feet)** | Chapter 6                      |
| 10            | Radiography of the Ankle and Calcaneus | Chapter 6                      |
| 11            | Radiography of the Tibia/Fibula and Knee  
               | **Test #6: Ankle and Calcaneus** | Chapter 6                      |
| 12            | **Test #7: Tibia/Fibula and Knee**  
               | Radiography of the Intercondylar Fossa and Patella | Chapter 6                      |
| 13*           | **Test #8: Intercondylar Fossa and Patella**  
               | Radiography of the Chest | Chapter 2                      |
| 14            | **Test #9: Chest Radiography**  
               | Radiography of the Abdomen | Chapter 3                      |
| 15            | **Test #10: Abdomen**  
<pre><code>           | Review for Final Examination |                             |
</code></pre>
<p>| 16            | <strong>Final Examination (Monday 12/18/17 at 1:00pm)</strong> |                             |</p>
<table>
<thead>
<tr>
<th>LECTURE DATE</th>
<th>WEEK</th>
<th>FRIDAY A.M. LAB TEST</th>
<th>FRIDAY P.M. LAB TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/28/17</td>
<td>1</td>
<td>Equipment</td>
<td>Equipment</td>
</tr>
<tr>
<td>9/4/17</td>
<td>2</td>
<td>Equipment/Communication</td>
<td>Equipment/Communication</td>
</tr>
<tr>
<td>9/11/17</td>
<td>3</td>
<td>Digits</td>
<td>Digits</td>
</tr>
<tr>
<td>9/18/17</td>
<td>4</td>
<td>Hand &amp; Wrist</td>
<td>Hand &amp; Wrist</td>
</tr>
<tr>
<td>9/25/17</td>
<td>5</td>
<td>Forearm, Elbow, Humerus</td>
<td>Forearm, Elbow, Humerus</td>
</tr>
<tr>
<td>10/2/17</td>
<td>6</td>
<td>Shoulder Girdle, Part I</td>
<td>Shoulder Girdle, Part I</td>
</tr>
<tr>
<td>10/9/17</td>
<td>7</td>
<td>Shoulder Girdle, Part II</td>
<td>Shoulder Girdle, Part II</td>
</tr>
<tr>
<td>10/16/17</td>
<td>8</td>
<td>Toes and Feet</td>
<td>Toes and Feet</td>
</tr>
<tr>
<td>10/23/17</td>
<td>9</td>
<td>Make Up Testing</td>
<td>Make Up Testing</td>
</tr>
<tr>
<td>10/30/17</td>
<td>10</td>
<td>Ankle &amp; Calcaneus</td>
<td>Ankle &amp; Calcaneus</td>
</tr>
<tr>
<td>11/6/17</td>
<td>11</td>
<td>Tibia/Fibula and Knee</td>
<td>Tibia/Fibula and Knee</td>
</tr>
<tr>
<td>11/13/17</td>
<td>12</td>
<td>Intercondylar Fossa &amp;</td>
<td>Intercondylar Fossa &amp;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Patella</td>
<td>Patella</td>
</tr>
<tr>
<td>11/20/17*</td>
<td>13</td>
<td>Thanksgiving Recess; no</td>
<td>Thanksgiving Recess; no</td>
</tr>
<tr>
<td></td>
<td></td>
<td>classes or labs</td>
<td>classes or labs</td>
</tr>
<tr>
<td>11/27/17</td>
<td>14</td>
<td>Chest Radiography</td>
<td>Chest Radiography</td>
</tr>
<tr>
<td>12/4/17</td>
<td>15</td>
<td>Abdomen Radiography</td>
<td>Abdomen Radiography</td>
</tr>
<tr>
<td>12/11/17</td>
<td>16**</td>
<td>Final Make Ups</td>
<td>Final Make Ups</td>
</tr>
</tbody>
</table>

*Wednesday follows Friday schedule

**Any make up labs must be completed no later than Friday December 15, 2017 provided that students have satisfied requirements in accordance with competency process explained in this course outline.
Evaluation of Student Learning:

The student must receive a minimum grade of “C” (75%) or higher in each component of the course (lecture, laboratory and clinical education) in order to continue in radiography courses. A grade of “P” (pass) must be earned in the clinical component. The following course grade distribution will be utilized:

- Lecture: 80%
- Laboratory: 20%
- Clinical: Pass/Fail (P/F)

Lecture Evaluation & Grading Policy:

A minimum of ten weekly written tests, a midterm and a final examination will be administered in the lecture component. The lecture grade will be determined on the basis of the following distribution:

- Weekly Tests: 40%
- Midterm Exam: 30%
- Final Exam: 30%

For students maintaining a B or higher average in the lecture component of the course, they will have the option not to take the comprehensive final examination in RAD127. In this case, the lecture grade will be calculated as follows:

- Weekly Tests: 57%
- Midterm Exam: 43%

Laboratory Evaluation & Grading Policy:

Laboratory testing is an integral part of the clinical competency process. This process begins with classroom instruction followed by laboratory demonstration. Students then practice those positions learned in lecture and demonstration.

Laboratory testing requires the student to demonstrate proficiency in positioning, patient care and communication, equipment use and radiation protection. Students must demonstrate a minimum of two positions chosen at random from those practiced in the laboratory during the current week. A minimum score of 85% is needed in order to successfully complete a laboratory test, also called a laboratory practical evaluation.

Each position is evaluated separately. Certain objectives must be successfully achieved in order to pass. The laboratory test will be terminated if the requirements of these areas are not met before a simulated exposure is
made. These objectives are related to proper communication, interpretation of the procedure to be demonstrated and radiation protection. A copy of the laboratory testing form will be distributed during the first laboratory practice session.

Students are required to complete eleven (11) laboratory tests (laboratory evaluations). To achieve the highest degree of success, students are urged to study the assigned material, ask relevant questions in class when the material is not clearly understood, and actively engage in laboratory practice. **Until a laboratory test is successfully completed, students are not permitted to perform that same procedure on patients in the hospital!** However, students are free to practice with each other while at the hospital when circumstances permit and make the best use of laboratory practice sessions. The best use of laboratory time requires observation, collaboration and participation.

The laboratory grading is based on the number of laboratory tests (not including equipment check) completed on the first attempt as follows:

\[
11 = 100\% (A); 10 = 91\% (A-); 9 = 82\% (B-); 8 = 73\% (D)
\]

When a laboratory test is unsuccessful, the student will be asked to retest provided that remediation is performed and that evidence of remediation is submitted in a timely fashion as determined by the course instructor. A maximum of two radiographic procedures can be retested one time. An unsuccessful retest in any one of these will result in an unsatisfactory laboratory grade. All outstanding laboratory testing must be completed by the end of the semester. Otherwise, the student will earn an unsatisfactory grade for the course.

**Clinical Education Evaluation & Grading Policy:**

There will be two (2) clinical evaluations that will cover the student's overall technical and professional development. Students will be evaluated weekly by the staff that they are assigned with. These weekly evaluations will become the basis for the clinical evaluations conducted by the senior clinical instructor and the adjunct clinical faculty member. An image evaluation presentation will be made by students that will demonstrate their ability to critique the quality of images taken in the clinical setting with respect to technique, positioning and other criteria (patient identification, marker placement, etc.).

Students are required to satisfactorily complete clinical competency testing involving three (3) radiographic procedures covered in lecture, evaluated in laboratory and performed at the initial level as defined in the Clinical Education Student Handbook. In this regard, a CCE is a clinical competency evaluation is that which is conducted by a clinical instructor or adjunct clinical faculty member to determine a student’s ability to successfully perform a radiographic procedure at an initial level of ability.
The clinical grade is computed as follows:

- Clinical Evaluations 40%
- Image Evaluation 30%
- Clinical Competency Evaluations 30%

**Clinical Assignment Schedule:**

Students will report to the assigned clinical facility prepared to begin clinical education at 8:00 a.m. unless otherwise notified. Specific clinical dates, hours and sites will be distributed at the start of the course.

*Note:* Students who demonstrate competency in any procedure may perform that procedure under indirect supervision. This means that the licensed radiographer need not be present in the radiograph room during the procedure, but must be adjacent to the room and immediately available should the student require assistance.

Students who produce unacceptable radiographs must repeat those radiographs under direct supervision regardless of the student's level of competency. Failure to comply with this rule is subject to disciplinary action.

**Clinical Education Policies:**

The student should refer to the clinical education handbook for the pertinent policies regarding attendance, punctuality, the clinical competency process, etc.

**Attendance Policy:**

1. Students are expected to be in attendance at the scheduled start time of all class and laboratory sessions; late arrival is disruptive to the class and instructor. Attendance will be taken for all lecture and lab sessions. The following grading system will be recorded for late arrival and absences:

   **A. Lecture:**
   1. Three points will be deducted from the final lecture grade for each late arrival to a scheduled lecture.
   2. Five points will be deducted from the final lecture grade for each absence from a scheduled lecture.

   **B. Laboratory:**
   1. Three points will be deducted from the final lab grade for each late arrival to a scheduled laboratory.
   2. A total of five (5) points will be deducted from the final laboratory grade for each lab test not taken on schedule. (Refer to item # 3-4 below)
2. Cell phones must be turned off upon entering the classroom. Receiving phone calls in tone or vibration mode are distracting to other students. Calls may not be made on personal cell phones during class time. Students may not charge their personal cell phone in the radiography classroom MS 314.

3. All students are required to attend every lab session. Students must be present for the entire period actively engaged in radiographic positioning, assisting classmates, and image evaluation. In case of emergency or illness, exceptions may be made if the student contacts the course instructor prior to the lab session. If the instructor is not available, a message must be transmitted by e-mail or voice mail before the lab session begins. A valid, documented excuse (i.e. doctor’s note, vehicular repair) must be presented the next class session. It will be the instructor’s prerogative to decide whether or not the excuse is valid. If deemed valid, a make-up session would be conducted in the college lab according to a schedule arranged by the instructor. Students may not lab test until the lab session has been completed. If a student misses more than one lab session clinical education progression may be jeopardized, leading to course failure.

4. Students who miss a laboratory test will be rescheduled according to a schedule arranged by the instructor. Students may not progress with the clinical competency process on the missed lab procedure; this may jeopardize completion of clinical education requirements. A total of five (5) points will be deducted from the final laboratory grade for each lab test not taken on schedule.

5. Make-up written tests are not permitted. Students must contact the instructor directly, leave a voice or e-mail message prior to the time of the scheduled exam. Students who miss an examination must provide a valid, documented excuse i.e. doctors note, vehicular repair by the next class session. If determined valid by the instructor, the comprehensive mid-term and/or final exam will be calculated with an additional weight equal to the missed examination. If the midterm examination is missed with valid excuse, the weight of the exam will be added to the final exam. This will serve as validation of material comprehension covered on the missed examination. Any unexcused examination will earn a zero (0) grade.

6. Students who miss the final examination must contact the instructor by email or phone by the start of the examination administration. A valid, documented excuse must be submitted within two days of the final exam administration date. Valid excuses include emergent situations that arose unexpectedly and could not be mitigated at the time of the final exam. Examples include but are not limited to death in family, illness, vehicular repair with supporting documentation from the respective agency. Planned vacations, events, advanced request for time away are not considered valid excuses. If determined valid, the make-up final exam date will be determined by the
course instructor in consultation with the student. The final exam must be taken prior to the start of the spring term to be eligible for the spring term radiography courses.

**Academic Integrity:**
Mercer County Community College is committed to Academic Integrity -- the honest, fair and continuing pursuit of knowledge, free from fraud or deception. This implies that students are expected to be responsible for their own work.

Academic Integrity is violated whenever a student:

A. Uses or obtains unauthorized assistance in any academic work.
B. Gives fraudulent assistance to another student.
C. Knowingly represents the work of others as his/her own, or represents previously completed academic work as current.
D. Fabricates data in support of an academic assignment.
E. Inappropriately or unethically uses technological means to gain academic advantage.

For any academic integrity violation, the faculty member will determine the penalty and shall notify the chairperson of the Academic Integrity Committee of the violation and the penalty imposed. Students should refer to the MCCC Student Calendar/Handbook for the complete policy and OMB210 (http://www.mccc.edu/academic_policies_integrity.shtml).

**Accessibility:**
Mercer County Community College is committed to ensuring the full participation of all students in its programs. If you have a documented differing ability or think that you may have a differing ability that is protected under the ADA or Section 504 of the Rehabilitation Act, please contact Arlene Stinson in LB216 (stinsona@mccc.edu) for information regarding support services.
Please note that an on-campus pre-clinical orientation is scheduled for Thursday September 7, 2017 at 8:30 AM in MS204. The orientation shall last about 3 hours with lunch to follow (brown bag). During lunch students will be introduced to their respective clinical instructors.

Students are expected to arrive for orientation in uniform. Orientation and clinical education materials will be distributed at that time. Attendance is mandatory. Students who miss this orientation without valid reason shall not be allowed to participate in clinical education.