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COURSE OUTLINE

Course Number	Course Title	Credits
RAD 227	Radiographic Procedures III	6

Hours:	Co-requisite
2 Lecture/3 Lab/ 45 clinical days	RAD 216

Catalog description (2006-2009 Catalog):

A continuation of Radiographic Procedures II, standard radiographic positioning with related medical terminology of the urinary system, alimentary canal, biliary system and cranium are presented. Laboratory simulation and evaluation are conducted. Students participate in correlated clinical experience in an affiliate hospital continuing with the clinical competency evaluation process.

Required texts:

Title: Textbook of Radiographic Positioning and Related Anatomy
Author: K. Bontrager
Publisher: Elsevier Mosby
Edition: Sixth

Title: Radiographic Positioning and Related Anatomy Workbook and Laboratory Manual
Author: Kenneth L. Bontrager
Publisher: C.V. Mosby
Edition: Sixth

Required device:

Goniometer

Revision date:
Summer 2009

Course coordinator:
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Course Competencies/Goals:

Upon completion of this course the student will be able to:

1. Interpret anatomical and medical terms of the cranium, urinary system, alimentary canal and biliary system and apply to radiographic procedures.

2. Compare contrast agents used for routine radiographic procedures of the urinary system, alimentary canal and biliary system.

3. Describe and perform routine radiographic procedures to demonstrate the urinary system, alimentary canal, biliary system and cranium.

4. Develop effective communication skills to efficiently perform the routine radiographic positions of the urinary system, alimentary canal, biliary system and cranium in the laboratory and clinical affiliate hospital.

5. Evaluate images of the cranium, urinary system, alimentary canal, and biliary system to determine quality with regard to demonstration of anatomy, positioning, density, contrast.

6. Correlate other imaging modalities and exam sequencing utilized to demonstrate anatomy and pathology of the urinary system, alimentary canal, biliary system and cranium.

7. Develop the technical competence to perform all types of diagnostic imaging procedures on a variety of patient types using various imaging equipment and processing modes with the appropriate level of supervision.

Course-specific General Education Knowledge Goals and Core Skills.

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.

Upon completion of the lecture and laboratory components, the student will be able to:
Unit Objectives:

Weeks 1 - 6: Contrast Media Procedures
Weeks 7 - 15: Cranium Radiography

- Identify the anatomical parts of the urinary, gastrointestinal and biliary systems on diagrams and radiographic images. (CG 1, 5; GE, 1, 3, A)
- Describe routine positions of the urinary system, alimentary canal, biliary systems and cranium; explain structures demonstrated. (CG 3; GE 1,3, A)
- Discuss equipment and supplies necessary to complete radiographic and fluoroscopic procedures of the urinary system, alimentary canal, biliary system and cranium. (CG 2, 3, 7; GE E)
- Explain the pharmacology of barium and iodine compounds. (CG 2; GE 3)
- Describe methods and techniques for administering various types of contrast agents. (CG 2; GE 3)
- In the laboratory simulated environment, perform routine radiographic procedures of the urinary system, alimentary canal, biliary system, and cranium. (CG 3, 4, 5, 6, 7; GE 1, 3, A, B, F)
- In the laboratory simulated environment, perform trauma radiographic procedures of the cranium. (CG 3, 4, 5, 6; GE, 1, 3, A, B, F)
- Given radiographs of various anatomical structures, evaluate positioning accuracy and image quality. (CG 5; GE 1, 3, A, B)

Clnical Education Weeks 1 – 15

Unit Objectives:

This portion of RAD 227 is designed to integrate classroom and laboratory preparation into a systematic and progressive clinical experience. Students will further develop proficiency in clinical objectives met in Radiographic Procedures I, II, and Clinical Practicum.

- Perform routine portable and operating suite radiographic procedures under direct supervision. (CG 3, 4, 7, GE 1, A, F)
- Develop positioning skills necessary to perform radiography of the urinary system, alimentary canal, biliary system and cranium. (CG 3, 4, 7, GE 1, A, F)
- Formulate and apply exposure factors appropriate to radiography of the urinary system, alimentary canal, biliary system and cranium. (CG 7, GE 2)
- Critique images for appropriate anatomy, image quality and patient identification. (GE A, B, C, D)
- Determine corrective measures to improve inadequate images. (CG 3; GE B, C, F)
- Execute medical imaging procedures under the appropriate level of supervision. (CG 6; GE 9, C, F)
- Observe advanced imaging modalities through affiliate facilities; compare and contrast imaging modalities. (CG 6, GE F)
- Explain radiographic procedures to patients/family members. (CG 2, 3, 4, 7, GE 1, A
- Adapt general procedural considerations to specific clinical settings. (CG 2, 7 GE 1, A, B, F)
- Cite the structures demonstrated on routine radiographic, fluoroscopic and basic CT images. (CG 5, GE 1, 3, A)
- Explain the patient preparation necessary for contrast media and cranium radiographic procedures. (CG 2, 4, 7, GE 1, A)
- Explain the routine and special positions/projections for all radiographic/fluoroscopic procedures. (CG 3, 7, GE 1, A)
- Define the categories of contrast agents and give specific examples for each category. (CG 2, GE 1, A)
- Explain the pharmacology of barium and iodine compounds. (CG 2, GE 1, A)
- Describe methods and techniques for administering various types of contrast agents. (CG 2, 7, GE 1, A)
- Exercise the priorities required in daily clinical practice. (CG 4; GE 1, B, F)
- 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. (CG 1; GE B, F, G)
- Provide patient-centered clinically effective care for all patients regardless of age, gender, disability, special needs, ethnicity or culture. (CG 1; GE 5, 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. (CG 1; GE 1, 5, A)
- Demonstrate competent assessment skills through effective management of the patient's physical and mental status. (CG 1; GE 5, B)
- Respond appropriately to medical emergencies. (CG 1; GE 1, A, B, F)
- Adapt procedures to meet age-specific, disease-specific and cultural needs of patients. (CG1, 3; GE 2, 3, B)

- Apply the appropriate medical asepsis and sterile technique. (CG 4, 5, 6; GE B)
- Report equipment malfunctions. (CG 2; GE 1, B)
- Examine procedure orders for accuracy and make corrective actions when applicable. (CG 1, 4, 6; GE A, B)
- Demonstrate safe, ethical and legal practices. (CG 2, 3; GE 9, C)
- Maintain patient confidentiality standards and meet HIPAA requirements.(GE 9, C)
- Demonstrate the principles of transferring, positioning and immobilizing patients. (CG 1; GE 1, B, F)
- Differentiate between emergency and non-emergency procedures. (CG 1, 2; GE B)
- Adhere to national, institutional and departmental standards, policies and procedures regarding care of patients, providing radiologic procedures and reducing medical errors. (CG 1, 2, 3, 4, 5)
- Select technical factors to produce quality diagnostic images with the lowest radiation exposure possible. CG 3; GE 2, 3, B, E)

Evaluation of Student Learning:

To be eligible for Advanced Clinical Experience I (RAD 240) and co-requisite courses, the student must earn a course grade of "C" (75%) or higher. In addition, the student must pass the lecture, laboratory and clinical components of the course with a minimum score of 75% or higher in each segment of the course.

Course Grade	**Lecture Grade**	**Lab Grade**
Lecture - 80%	Examinations - 40%	Refer to Page 8
Lab - 20%	Mid-Term - 30%	
Clinical - Pass/Fail (P/F)	Final Exam - 30%	

A minimum of four (4) written examinations and a comprehensive final examination will be administered in the lecture component. A minimum of ten (10) laboratory practical examinations will be given. Details of test formats and dates will be provided by the instructor.

Academic Integrity Statement:

Mercer County Community College is committed to Academic Integrity -- the honest, fair and continuing pursuit of knowledge, free from fraud or deception. 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.

In all cases, the instructor shall notify the Chair of the Academic Integrity Committee of the violation. Students should refer to the MCCC Student Handbook for the complete policy and the Radiography Clinical Education Student Handbook for additional information regarding reporting of sanctions to the American Registry of Radiologic Technologists.

Clinical Evaluation:

There will be (2) Clinical Evaluations which will cover the student's overall technical and professional development. Students will be evaluated weekly by the staff they are assigned to which becomes the basis of the Clinical Evaluations.

Periodic image evaluation presentations will be made by students which will demonstrate their ability to evaluate the quality of finished radiographs with respect to technique, positioning and other criteria (patient identification, marker placement, etc.)

Students are required to satisfactorily complete competency evaluations as delineated in the relevant annual Clinical Education Student Handbook.

The clinical grade is computed as follows:

Clinical Instructor Evaluations	50%
Clinical Competency Evaluations	30%
Image Evaluation	20%

Clinical Assignment Schedule:

Students will report to their assigned clinical facility on Mondays, Wednesdays and Fridays prepared to begin clinical education at 8:00 a.m. until 4:00 p.m. unless otherwise notified. Specific clinical dates and assignments 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 radiographic 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 pertinent policies regarding attendance, punctuality, CCEs, 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 unexcused late arrival and absence; the instructor will determine the validity of the late arrival and absence on an individual basis:

   A. Lecture:
   1. Three (3) points will be deducted from the final lecture grade for each unexcused late arrival to a scheduled lecture. There is no limit on the maximum total number of points that can be deducted from the final grade
   2. Five (5) points will be deducted from the final lecture grade for each unexcused absence from a scheduled lecture. There is no limit on the maximum total number of points that can be deducted from the final grade

   B. Laboratory:
   1. Three (3) points will be deducted from the final lab grade for each late arrival to a scheduled laboratory.
   2. All students are required to attend every lab session. Students must be present for the entire lab 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.

   3. 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.

   4. Make-up written exams 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. This will serve as verification of material comprehension covered on the missed examination.

   5. 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.

Topical Outline

The general plan for the 15-week semester identifies the topic to be discussed and simulated in the laboratory. Reading assignments will be provided by the individual instructor.

Week #	Topic
1.	Course Introduction Esophagraphy
2.	UGI Series Small Bowel Series Surgical Cholangiography
3.	**Exam 1 (Weeks 1 - 2)** Barium Enema - Single Contrast
4.	Barium Enema – Dual Contrast Urinary System
5.	**Exam 2 (Weeks 3 – 4 BE)** Urinary System
6	**Comprehensive Mid-Term Examination**
7.	Skull Morphology, Topography, Positioning Lines and Considerations Sinuses
8.	**Exam 3 (Week 7)** Skull Non-Trauma
9.	Skull Trauma Facial Bones Non-Trauma
10.	**Exam 4 (Weeks 8 - 9 Skull)** Facial Bones Non-Trauma continued
11.	Nasal Bones, Zygoma, Orbits
12.	Mandible, TMJ's
13.	Facial Bones Trauma
14.	Final Exam Review
15.	Comprehensive Final Exam

Week 1-15: Clinical education will be conducted three (3) days per week.

RADIOGRAPHIC PROCEDURES LABORATORY TESTING POLICY

Laboratory testing is an integral part of the clinical competency process. This process begins with classroom instruction followed by laboratory demonstration.

Laboratory testing requires the student to demonstrate proficiency in positioning, patient care and communication, equipment use and radiation protection. All laboratory testing is on a pass/fail basis utilizing an objectives-based evaluation form. Students will be questioned on the procedure protocol applicable to contrast media radiography and will be evaluated on on or two radiographic positions. Students must demonstrate a minimum of two positions chosen at random from those practiced in the laboratory during the current week applicable to the cranium.

Each position is evaluated separately. Failure to accomplish specific objectives related to radiation protection, correct procedure identification and patient identification will result in an unsuccessful laboratory test, even if all other aspects of the testing are performed successfully. Otherwise, each position must be demonstrated by the student with no more than one intervention or prompt from the evaluating instructor for every two positions tested.

For RAD 227, students are required to complete all 12 laboratory tests (laboratory practical 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 practice often. **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.**

Grading for RAD 227 requires successful completion of each component of the course (lecture, laboratory and clinical) with a minimum of 75%. The laboratory grading is based on the number of lab tests completed **on the first attempt** as follows:

12 = 100% 11 = 92% 10 = 85% 9 = 77% 8 = 69%

When a laboratory test is failed, the student must complete remediation as specified by the instructor. A retest of the failed laboratory examination will be scheduled prior to the end of the semester. Only one retest is permitted per failed lab test. Failure to successfully complete a lab test on the second attempt will result in a failing laboratory grade. Consequently, the student will fail RAD 227. Students who are otherwise in good standing must complete all outstanding laboratory testing by the end of the semester. Otherwise, a failing grade will be received for the course.

LECTURE SCHEDULE – FALL 2009 (TUESDAY 1:25 - 3:15 PM)

WEEK #	DATE	TOPIC	READING ASSIGNMENT
1	9/1	Course Introduction Esophagraphy	P.446 – 449, 456 – 467, 475 – 478
2	9/8	Upper G.I. Series Small Bowel Series Surgical Cholangiography	P.450 – 455, 468 – 473, 479 – 483, P.486 – 487, 490 – 497, 510 - 513 P.526 – 528, 532 – 533, 536
3	9/15	**EXAM 1 (Weeks 1 - 2)** Barium Enema – Single Contrast	P.488 – 489, 491, 498 - 506, 508 – 511, 514, 517 – 518, 521 – 522
4	9/22	Barium Enema – Dual Contrast Urinary System	P.505-506, 514–516, 518–521, 523 P. 544 – 552, 555 – 578
5	9/29	**EXAM 2 (Weeks 3 - 4 BE)** Urinary System continued	
6	10/6	**Comprehensive Mid-Term Exam**	
7	10/13	Skull Morphology, Topography, Positioning Lines & Considerations Sinuses	P. 368 – 375, 380 – 385 P. 408 – 410, 416, 438 – 442, 444
8	10/20	**EXAM 3 (Week 7)** Skull Non-Trauma	P. 388 – 395
9	10/27	Skull Trauma Facial Bones Non-Trauma	P. 627 – 629 P. 402 – 405, 413 – 415, 419-422
10	11/3	**EXAM 4 (Weeks 8 - 9 Skull)** Facial Bones Non-Trauma continued	P. 402 – 405, 413 – 415, 419-422
11	11/10	Nasal Bones, Zygoma, Orbits	P. 411 – 414, 417, 423 – 428
12	11/17	Mandible, TMJ's	P. 406 – 407, 429 – 437
13	12/1	Facial Bones Trauma	P. 630 – 631
14	12/8	Final Exam Review	
15	12/15	**Comprehensive Final Exam**	

LAB PRACTICE & TEST SCHEDULE FALL 2009
Thursday AM Lab Practice 8:00 PM – 10:50 PM
Thursday PM Lab Practice 1:30 PM - 4:30 PM
Lab Test @ 4:30 PM – 7:30 PM

DATE	LAB PRACTICE THURS AM & PM	LAB TEST DATE Tues PM	LAB TEST DATE Thurs PM
9/3	Esophagraphy	9/8	9/10
9/10	UGI Series/Small Bowel	9/15	9/17
9/17	BE Single Contrast	9/22	9/24
9/24	BE Dual Contrast	9/29	10/1
10/1	IVU	10/6	10/8
10/8	Make-Up Lab Practice	10/13	10/15
10/15	Sinuses	10/20	10/22
10/22	Skull Non-Trauma	10/27	10/29
10/29	Skull Trauma	11/3	11/5
11/5	Facial Bones Non-Trauma	11/10	11/12
11/12	Nasal Bones, Zygoma, Orbits	11/17	11/19
11/19	Mandible	12/1	11/24 (Tues)
12/3	Facial Bones Trauma	12/8	12/10
12/10	Make-up Lab Practice	12/15	12/15 (Tues)

Mercer County Community College
Radiography Program
Clinical Education Dates - Class of 2010
Course: RAD227 Semester: Fall 2009

August

M		W		F
31				

September

M		W		F
		2		4
		9		11
14		16		18
21		23		25
28		30		

October

M		W		F
				2
5		7		9
12		14		16
19		21		**23**
26		28		30

November

M		W		F
2		4		6
9		11		13
16		18		20
23		25		
30				

December

M		W		F
		2		4
7		9		11
14		**16**		

Labor Day Holiday:	September 7
Mid-term Evaluation Due:	October 23
Thanksgiving Holiday:	November 26-27
Final Evaluation Due:	December 16
Final Exams:	December 10 - 15