



**RADIOLOGIC TECHNOLOGY PROGRAM
RDT 204: PRINCIPLES OF EXPOSURE III
Fall 2011**

COURSE DESCRIPTION:

This course is a continuation of the concepts covered in RDT 104 and RDT 154. Digital image acquisition, display and modification are covered. Principles of fluoroscopy and tomography are provided. Analysis of the digital image is emphasized. *Hours: 26 lecture. Prerequisites: RDT 104 and RDT 154 with grades of "C" or better or permission of the department head. Course fee: \$40. Materials fee: \$15. Usually offered in the fall.*

CREDIT HOURS: 2 credit hours

FACULTY: Karie Solembrino, M.S., R.T. (R) (CT) (ARRT)
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Access to course instructor through Blackboard

OFFICE HOURS: Contact instructor through Blackboard for assistance and specific tutoring services offered in the fall 2011 semester.

TEXTBOOKS: Callaway, W. (2008). *Comprehensive Review of Radiography*. (5th Ed.) Mosby.

Carlton, R. & Adler. A. (2006). *Principles of radiographic imaging* (4th Ed.). Mosby, St. Louis: MO.

Carter and Veale. (2010). *Digital radiography and PACS*. (2nd Ed.) Mosby, St. Louis: MO.

Fauber, T. L. (2009). *Radiographic Imaging and Exposure* (3rd ed). Mosby, St. Louis, MO.

WEBSITE: Subscription to www.radrevieweasy.com

COURSE OBJECTIVES:

<u>Course Objectives</u>	<u>Assessment Goals</u>	<u>Assessment Strategies</u>
<p>1. Explain the principles of fluoroscopy in terms of image acquisition, equipment operation, procedures performed, and radiation exposure dose to the patient and radiographer.</p> <p>(GEO 1, 2, 3, 4, 7)</p>	<ol style="list-style-type: none"> 1. Describe the historical evolution of fluoroscopy. 2. Explain image-intensified fluoroscopy. 3. Calculate gain and conversion factors as related to image-intensified fluoroscopy. 4. Describe fluoroscopic image formation. 5. Identify the components of the image intensifier on a diagram. 6. Explain the source of radiation exposure for the radiographer during fluoroscopy. 7. Explain the cardinal rules of radiation protection and the application of these rules in fluoroscopy. 8. Describe the equipment used in fluoroscopy for the purpose of radiation protection for the radiographer. 9. Explain how fluoroscopic guidance is used for imaging procedures. 10. Describe fluoroscopic recording equipment for conventional and digital fluoroscopy. 	<p>Discussion Questions Mosby Workbook Radreview Paper Quizzes Chapter Tests Comprehensive Final</p>
<p>2. Explain the principles of conventional tomography in terms of image acquisition, equipment operation, procedures performed, and radiation exposure dose to the patient.</p> <p>(GEO 1, 2, 3, 7)</p>	<ol style="list-style-type: none"> 1. Identify the equipment required for conventional tomography. 2. Describe the process for determining slice thickness for conventional tomography. 3. Explain the radiographic appearance of a tomogram according to the anatomy location in reference to the fulcrum. 4. Describe exposure technique selection for conventional tomography. 	<p>Discussion Questions Mosby Workbook Radreview Paper Quizzes Chapter Tests Comprehensive Final</p>
<u>Course Objectives</u>	<u>Assessment Goals</u>	<u>Assessment Strategies</u>
<p>3. Explain the principles</p>	<ol style="list-style-type: none"> 1. Define magnification radiography. 	<p>Discussion Questions</p>

<p>of magnification radiography in terms of image acquisition, equipment operation, procedures performed, and radiation exposure dose to the patient.</p> <p>(GEO 1, 2, 3, 7)</p>	<ol style="list-style-type: none"> 2. Describe the purpose of magnification radiography. 3. Describe the image quality of a magnified image. 	<p>Mosby Workbook Radreview Paper Quizzes Chapter Tests Comprehensive Final</p>
<p>4. Describe methods of radiation protection, beam limitation, and exposure control.</p> <p>(GEO 1, 2, 3, 4, 7, 8)</p>	<ol style="list-style-type: none"> 1. Explain the composition of grids. 2. Describe how grid ratio affects patient dose, exposure latitude, and scatter control. 3. Explain the application of grids in terms of grid pattern, grid focus, grid ratio, and grid frequency. 4. Identify the most effective beam limiting device and its effect upon density contrast, field size, volume of tissue irradiated, scatter production, and patient dose. 5. Explain the purpose of collimation and its impact upon image quality and patient dose. 6. Evaluate exposure factors and determine when patient dose is greatest and least based upon technique selected. 7. Explain the cardinal rules of radiation protection and their application to reduce patient and technologist dose in the clinical arena. 8. Identify manual exposure techniques utilized for selected projections according to personal body habitus. 	<p>Discussion Questions Mosby Workbook Radreview Paper Quizzes Chapter Tests Comprehensive Final</p>
<p><u>Course Objectives</u></p>	<p><u>Assessment Goals</u></p>	<p><u>Assessment Strategies</u></p>
<p>5. Describe the exposure parameters</p>	<ol style="list-style-type: none"> 1. Explain the controlling and influencing factors affecting 	<p>Discussion Questions Mosby Workbook</p>

<p>manipulated by the Radiologic Technologist in terms of modifications to density, contrast, recorded detail, and patient dose.</p> <p>(GEO1, 2, 3, 4, 5, 6, 7)</p>	<p>radiographic density.</p> <ol style="list-style-type: none"> 2. Explain the controlling and influencing factors affecting radiographic contrast. 3. Explain the controlling and influencing factors affecting recorded detail. 4. Describe factors which affect radiation dose to the patient. 5. Explain beam attenuation according part thickness, body habitus, and tissue composition. 	<p>Radreview Paper Exposure Project Exposure Experiment Exposure Technique Book Quizzes Chapter Tests Comprehensive Final</p>
<p>6. Explain the mathematical formulas for changing variables affecting density, distortion, and intensity of the x-ray beam.</p> <p>(GEO 1, 2, 3, 4, 5, 7)</p>	<ol style="list-style-type: none"> 1. Identify and explain the density maintenance formula. 2. Identify and explain the inverse square law. 3. Identify and explain the grid conversion formula. 4. Identify and explain the relative speed formula. 5. Identify and explain the 15% rule. 6. Identify and explain unsharpness, SOD, and image size formulas. 7. Evaluate exposure factors for the greatest/least density, contrast, scatter, distortion, recorded detail, and patient dose received. 	<p>Discussion Questions Mosby Workbook Radreview Exposure Project Exposure Experiment Exposure Technique Book Paper Quizzes Chapter Tests Comprehensive Final</p>
<p>7. Explain film image acquisition, automatic processing, and construction of the film/intensifying screens.</p> <p>(GEO 1, 2, 3, 7)</p>	<ol style="list-style-type: none"> 1. Identify the components of the x-ray film. 2. Identify the components of the image intensifying screen. 3. Describe the acquisition of the latent image. 4. Describe the conversion of the latent image into a manifest radiographic image. 5. Identify the chemicals used within the automatic processor and the function of each in the conversion of the latent image into manifest. 	<p>Discussion Questions Mosby Workbook Radreview Paper Quizzes Chapter Tests Comprehensive Final</p>
<p><u>Course Objectives</u></p>	<p><u>Assessment Goals</u></p>	<p><u>Assessment Strategies</u></p>
<p>8. Explain the principles of digital imaging in terms of image</p>	<ol style="list-style-type: none"> 1. Describe digital image characteristics including pixel elements, pixel size, matrix size, spatial resolution, bit depth and 	<p>Discussion Questions Mosby Workbook Radreview</p>

<p>acquisition, equipment operation, terminology descriptions, exposure latitude, dynamic range, image quality parameters, image analysis, and radiation exposure dose to the patient.</p> <p>(GEO 1, 2, 3, 6, 7)</p>	<p>information content.</p> <ol style="list-style-type: none"> 2. Explain the operation of digital receptors for cassette-less systems including TFT arrays, CCD and CMOS systems. 3. Explain the operation of digital receptors for cassette-based systems. 4. Compare detector properties and evaluative criteria according to DQE, speed class, spatial resolution, contrast resolution, sampling frequency, dynamic range, contrast resolution, and exposure latitude. 5. Explain raw data acquisition of the digital image. 6. Describe image extraction of the cassette-less system. 7. Describe image extraction of the cassette-based system. 8. Explain exposure indicators in terms of relationship to patient exposure, dose area product, vendor specific criteria, centering of anatomical structure, and beam collimation. 9. Analyze the histogram according to kVp administered for the exposure. 10. Describe reasons for histogram analysis errors. 11. Explain the digital imaging receptor's response to scatter radiation and methods for minimizing this degradation to image quality. 12. Explain the application of grids for quality improvement of the digital image. 13. Identify and describe digital image artifacts. 14. Identify exposure parameters affecting image quality. 15. Describe the fundamentals of software image processing which includes: automatic rescaling, final image processing, effects of excessive image processing, and recognition of image processing errors affecting image clarity. 16. Evaluate digital image quality according to the exposure indicator, contrast, recorded detail, presence of image artifacts, evidence of 	<p>Exposure Experiment Paper Quizzes Chapter Tests Comprehensive Final</p>
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	<p>exposure recognition failure or histogram analysis error.</p> <p>17. Describe quality assurance as it pertains to the digital image.</p>	
<p>9. Explain the components of the AEC and its function in the clinical arena.</p> <p>(GEO 1, 2, 3, 5, 6, 7)</p>	<ol style="list-style-type: none"> 1. Differentiate between manual and AEC exposure techniques. 2. Identify the parameters the technologist selects when using the AEC. 3. Evaluate the two types of AEC systems and the function of each. 4. Identify errors which may occur while using the AEC. 	<p>Discussion Questions Mosby Workbook Radreview Quizzes Chapter Tests Comprehensive Final</p>
<p>10. Evaluate images for the presence of destructive and additive pathology.</p> <p>(GEO 1, 2, 3, 5, 7)</p>	<ol style="list-style-type: none"> 1. Differentiate between additive and destructive pathologic conditions. 2. Describe the radiographic appearance of destructive and additive pathologies in terms of radiographic appearance, beam attenuation, and changes to anatomical structures. 3. Explain how exposure factors are modified according to patient position, projection, and disease process. 	<p>Discussion Questions Mosby Workbook Radreview Quizzes Chapter Tests Comprehensive Final</p>
<p>11. Explain the interaction of x-radiation with matter and the creation of the x-ray within the tube.</p> <p>(GEO 1, 2, 3, 5, 7)</p>	<ol style="list-style-type: none"> 1. Differentiate between the interactions of x-radiation in the patient's body. 2. Differentiate between the interactions which occur within the x-ray tube. 3. Explain how the interactions in the tube occur according to the exposure selection. 4. Explain how the interactions in the patient occur according to the exposure selection. 5. Explain how the interactions in the patient effect patient dose and occupational dose received. 	<p>Discussion Questions Mosby Workbook Radreview Quizzes Chapter Tests Comprehensive Final</p>
<p>12. Evaluate images for exposure, positioning, and evaluation criteria.</p> <p>(GEO 1, 2, 3, 6, 7, 8)</p>	<ol style="list-style-type: none"> 1. Evaluate images for CR placement and accurate positioning. 2. Explain evaluation criteria for each projection. 3. Identify anatomical structures on the image pertinent to the exam. 	<p>Discussion Questions Mosby Workbook Image Analysis Quizzes Chapter Tests Comprehensive Final</p>

COURSE CONTENT:

1. Fluoroscopy image acquisition.
2. Fluoroscopy equipment.
3. Fluoroscopy terminology.
4. Fluoroscopy brightness, flux gain, and minification gain calculations.

5. Fluoroscopy radiation dose considerations.
6. AEC operation principles.
7. AEC equipment.
8. AEC errors.
9. AEC radiation dose considerations.
10. Conventional tomography principles.
11. Conventional tomography image acquisition.
12. Conventional tomography equipment.
13. Magnification radiology purpose and principles.
14. Principles of digital image acquisition.
15. Digital imaging equipment.
16. Methods of radiation protection for the patient and Radiologic Technologist
17. Beam limiting devices.
18. Components of the x-ray tube and their function.
19. Exposure factors affecting image quality.
20. Calculating adjustments to radiographic density according to the density maintenance formula, inverse square law, grid conversion factors, relative screen speed, the reciprocity law, and 15% rule.
21. Film acquisition process.
22. Automatic film processing
23. Components of the film/intensifying screens.
24. Identify exposure techniques utilized for various body habitus.
25. Evaluate the presence of additive and destructive pathology on a radiograph, the appearance, and changes in exposure technique to accommodate for the presence of the disease process.
26. Explain interactions of x-radiation with tissue in the human body.
27. Explain interactions which occur within the x-ray tube.
28. Evaluate images for correct positioning, exposure, and evaluation criteria of pertinent anatomical structures.

The RDT course content reflects the American Society of Radiologic Technologists (ASRT) Radiography curriculum, the American Registry of Radiologic Technologists (ARRT) Licensure examination requirements, and the master plan of education enforced by the Joint Review Committee on Education in Radiologic Sciences (JRCERT).

ACADEMIC HONESTY POLICY

Students found exhibiting any of the following types of behavior during or in the preparation/performance of any quiz, project, report, test, or final exam will receive a zero "0" for the assignment, and the student conduct violation will be referred to the Student-Faculty Disciplinary Committee. Cheating will not be tolerated in the Radiologic Technology program. Students found cheating will be DISMISSED from the Radiologic Technology program.

- A. Cheating is defined as the act of obtaining information or data improperly or by dishonest or deceitful means; and
- B. Plagiarism is defined as the copying or imitating the language, ideas, or thoughts of another author and presenting them as one's original work, the copying of a theme or section from a book or magazine without giving credit in a footnote or copying from the manuscript of another student.

Sharing information present on a quiz or test are examples of academic dishonesty and will result in a grade of "F" for the course and immediate dismissal from the Radiologic Technology program.

RECOMMENDED MATERIALS FOR ONLINE COURSE COMPLETION

Materials:

- A computer with Windows XP or greater and access to the Internet (or compatible operating system).
- Microsoft Office 2000 Word or greater (Not Microsoft Works or Word Perfect).
- Microsoft Internet 6.0 or greater.

Skills:

- Basic knowledge of Internet and computers.
- Know how to send and receive attachments through email.
- Be able to work independently and motivated to complete assignments on a timely basis.

College computer access is provided if students do not have access to a computer system at home. Please refer to www.worwic.edu to locate media center hours in each of the respective buildings on campus.

ONLINE COURSE ORIENTATION

Monday August 15, 2011 9:00 am to 11:00 am in AHB 303. The following will be reviewed in the RDT 201 Online course orientation: (1) Blackboard components, (2) Netiquette, (3) Assignments required for the course/assignment submission, (4) Exam/Quiz completion, (5) Class Guidelines/Expectations, (6) Course materials, (7) Listening to lectures presented through PowerPoint, (8) Contacting course instructor, and (8) Tutoring services provided for the course. Students are encouraged to contact the course instructor with any questions regarding the online course orientation.

ONLINE CLASS GUIDELINES

This class is a combination of text material, assignments, examinations, and participation in online class discussions. Material is presented through the textbook and within Blackboard. Active participation in the online course room is expected. In addition, the instructor will provide online assistance through the course chat room and tutoring services on campus.

Assignments must be submitted by the due dates/times outlined within the course syllabus. Assignments are a requirement. Therefore, failure to submit any assignment by the due date/time will result in a 0 for the assignment and 5% deduction from the course final grade for each infraction. There are no exceptions to this policy.

Example:

Student does not turn in discussion questions for a week = 0 and 5% deduction.

Same student does not turn in registry review assignment = 0 and another 5% deduction.

The student would receive two zeros and a total of 10% off of the course final grade for failure to submit two assignments.

Technology is not always reliable; therefore, count on problems with computers, and plan your assignments and exams accordingly. Since all communication for this course is written, it is essential that proper writing practices are used for email as well as discussion postings:

- Emails begin with a salutation and end with a closing.
- Sentences begin with a capital letter, and end with a period.
- Proper paragraphing should be used.
- Only complete sentences should be used unless presenting a list.

Text messaging shortcuts may not be used. Students are expected to use spell check to ensure accuracy of communications submitted through the online course environment.

COMMUNICATION WITH INSTRUCTOR

Students are encouraged to contact the course instructor with questions regarding online expectations, assignments, and didactic content. **The most effective method to contact the course instructor is through email in Blackboard.** The instructor will logon to Blackboard multiple times daily to answer questions and provide clarification to course contact. If the student

needs to verbally speak to the course instructor, please leave a contact number in the email. All emails will be answered within 24-hours by the course instructor.

During the time period when the instructor is off-campus, students may use text messaging to contact the course instructor between the hours of **10 am to 6 pm** daily for quick questions which can be easily addressed via this communication method.

If for any reason a student is unable to reach the course instructor, call the RDT Administrative Associate Amy Brown at (410) 572-8741 and she will obtain immediate contact with the course instructor and relay your message/question.

INSTRUCTIONAL MATERIALS

The following are instructional materials which will be utilized for RDT 201: (1) Assigned Textbook, (2) Links to websites, 3) References to additional textbooks, and (4) PowerPoint Presentations.

BLACKBOARD COMPONENTS

The following are tools the course instructor will be using in Blackboard:

Syllabus: The posted course syllabus documents the didactic schedule, assignments, due dates, and information pertinent to the course.

Messages: Email from the course instructor will be located under the messages section of Blackboard. Students may email the instructor and other students in the class through messages. Email is the method of communication between students and the course instructor. Students should visit the messages section daily in the course for new information sent by the instructor.

Course Content: The following items will be located within the course content of Blackboard: (1) PowerPoint Presentations, (2) Quizzes, (3) Study Guides and Reviews, and Assignment information. Content folders will be labeled by the dates/weeks in the semester to organize course material.

Grades: Students can view grades in Blackboard. All graded assessments will be recorded into Blackboard.

Discussions: Students are required to answer discussion questions posted in Blackboard. The purpose of the discussion questions is to assist the student in mastering course objectives.

CLASS GUIDELINES/EXPECTATIONS

The semester is broken down into weeks. **Each week begins on Monday and ends on Sunday.** All course assignments submitted through Blackboard are due at midnight on Sunday nights. Projects and/or assignments which cannot be submitted through Blackboard are due by 4:30 pm to the RDT department on campus.

Students are required to thoroughly complete all assignments/activities. No incomplete or half-attempted work will be accepted. Refer to the course assignment section of the syllabus for due dates, times, and required criteria for each assignment.

Online courses require students to exhibit increased motivation to stay on track and complete all required activities. It is the student's responsibility to complete all assigned work. Students are encouraged to read emails and reminders submitted weekly from course instructor.

Contact course instructor with questions/clarification on online course content in enough time to successfully complete each required assignment.

Student will have access to one week at a time in Blackboard. Content will be made available according to the topics reviewed in the syllabus. Once content has been made available to the student, it will remain in the student's view for the entire semester.

FALL 2011 RDT TUTORING

Tutoring for RDT 201 will occur when the course instructor returns to campus. Tutoring dates and times will be communicated through Blackboard. **Students are required to notify the course instructor of attendance to tutoring sessions through Blackboard.** Tutoring sessions will be cancelled if student attendance is not confirmed.

EXPOSURE REGISTRY REVIEW WORKBOOK

(GEO 1, 2, 3, 4, 5, 7) (CO 1-12)

Students will complete the Image Production and Evaluation section of the Mosby's Comprehensive Registry Review Workbook. **Failure to submit the registry review workbook assignment will result in a 0 for the assignment and 5% off of the RDT 204 Principles of Exposure III course final grade. NO LATE ASSIGNMENTS WILL BE ACCEPTED. Failure to follow directions will result in a grade of 0 for the assignment.**

Review of Image Production and Evaluation Chapter 4 Pages 85-116

Read the review of image production and evaluation. Complete questions 1-100. Type your answers in a Microsoft Word compatible document. **HIGHLIGHT IN RED** the questions you answered incorrectly. Document your score (ex: 90/100). Identify and document four specific areas you need to review and how you plan to improve in the areas identified.

The Mosby's Image Production and Evaluation Registry Review Workbook Assignment is due Sunday November 13, 2011 at 12:00 am midnight through Blackboard. Send the assignment as an attachment through an email message.

DISCUSSION QUESTIONS (GEO 1, 2, 3, 7) (CO 1-12)

Students will answer discussion questions posted in Blackboard. The purpose of the discussion questions are to provide students the opportunity to apply course objectives. To access these questions, click on discussions. Click on the question/assignment posted by the course instructor and select reply. Follow the discussion question rubric located in the course syllabus for grading criteria. Discussion question posts are due on Sundays each week at 12:00 am midnight.

Failure to submit discussion questions by the due dates/times will result in a grade of 0 and 5% deducted from the RDT 201 final course grade. NO LATE ASSIGNMENTS WILL BE ACCEPTED.

RADREVIEW EASY REGISTRY REVIEW (GEO 1, 2, 3, 4, 5, 7) (CO 1-12)

Students will complete Image Production and Evaluation registry review tests in the www.radrevieweasy website. The score received is the score earned. **Students must score a minimum of 80% on each Image Production and Evaluation registry review test.** Students are not permitted to submit scores less than an 80%. **Scores submitted less than a 80% will receive a grade of 0 for the assignment. Students must complete in TEST MODE.**

Follow these directions when completing the radreview Image Production Questions:

1. Specify Exam Mode = Select “Exam Mode”
2. Specify Question Type = “All Questions”
3. Specify Exam Options = “I want to specify one or more specialties to include on this exam”
 - Check box and select Image Production and Evaluation
 - Should check all of the boxes under the heading
4. Select how many questions = **Select 150 Questions each time you take the test**

Radreview easy assignments are due at 12:00 am midnight on the due date. Students are required to email the instructor through Blackboard the scores earned, the date the assignment was completed, and username/password to review scores for credit.

Failure to submit the Radreview assignments will result in a 0 for the assignment and 5% off of the RDT 204 Principles of Exposure III course final grade. NO LATE ASSIGNMENTS WILL BE ACCEPTED. Failure to follow directions will result in a grade of 0 for the assignment.

EXPOSURE TECHNIQUE BOOK (GEO 1, 2, 3, 4, 8) (CO 5, 6, 8)

Create an exposure technique book which can be utilized in the clinical setting and as a certified Radiologic Technologist. Techniques should be accurate and realistic to the student’s personal body habitus. In addition, for each projection, the student should include two additional exposure techniques for patients possessing a body habitus which differs from the student’s personal body habitus. **Students should document the clinical site where the technique is applicable for the specified projection and have the clinical instructor for that site to initial the technique for accuracy.**

Required exams for the exposure technique book are located at the end of the course syllabus. Refer to the rubric at the conclusion of the course syllabus for the grading criteria for this assignment. **The exposure technique book is due November 21, 2011 at 4:30 to the course instructor.**

EXPOSURE TECHNIQUE BOOKS SUBMITTED LATE WILL RECEIVE A GRADE OF 0. NO PARTIALLY COMPLETED TECHNIQUE BOOKS WILL BE ACCEPTED. FAILURE TO SUBMIT THE EXPOSURE TECHNIQUE BOOK WILL RESULT IN A GRADE OF 0 AND 5% OFF OF THE RDT 204 FINAL COURSE GRADE.

EXPOSURE EXPERIMENT CONSTRUCTION (GEO 1, 2, 3, 5, 7) (CO 5, 6, 8)

Students are to form groups to construct an exposure experiment. The purpose of this assignment is for students to apply theoretical knowledge to the clinical arena. Students may work in groups of two or three to complete the exposure experiment. Refer to the exposure experiment rubric located at the conclusion of the course syllabus for the grading criteria for this assignment. **The exposure experiment completed document is due on December 5, 2011 at 12:00 am midnight in blackboard. The CD of the assignment is due on December 5, 2011 at 4:30 pm to the course instructor.**

EXPOSURE EXPERIMENTS SUBMITTED LATE WILL RECEIVE A GRADE OF 0. NO PARTIALLY COMPLETED EXPERIMENTS WILL BE ACCEPTED. FAILURE TO SUBMIT THE EXPOSURE EXPERIMENT WILL RESULT IN A GRADE OF 0 AND 5% OFF OF THE RDT 204 PRINCIPLES OF EXPOSURE III FINAL COURSE GRADE. ALL STUDENTS MUST PARTICIPATE IN THE EXPOSURE EXPERIMENT TO RECEIVE CREDIT.

PHANTOM PATIENT PROJECT (GEO 1, 2, 3, 5, 7) (CO 5, 6, 8, 9, 10)

Students are to form groups to create a phantom patient. Students will construct a patient utilizing any type of materials which will demonstrate the beam attenuation characteristics learned in class. The purpose of this assignment is for students to apply theoretical knowledge to the clinical arena. Students may work in groups of two or three to complete the exposure experiment. Refer to the patient phantom project rubric located at the conclusion of the course syllabus for the grading criteria for this assignment. **The phantom patient project completed document is due November 28, 2011 at 12:00 am midnight in blackboard. The CD of the assignment is due on November 28, 2011 at 4:30 pm to the course instructor.**

PHANTOM PATIENT PROJECTS SUBMITTED LATE WILL RECEIVE A GRADE OF 0. NO PARTIALLY COMPLETED PROJECTS WILL BE ACCEPTED. FAILURE TO SUBMIT THE PATIENT PHANTOM PROJECT WILL RESULT IN A GRADE OF 0 AND 5% OFF OF THE RDT 204 PRINCIPLES OF EXPOSURE III FINAL COURSE GRADE. ALL STUDENTS MUST PARTICIPATE IN THE PATIENT PHANTOM PROJECT TO RECEIVE CREDIT.

ELECTRONIC/INFORMATION LITERACY WRITING ASSIGNMENT

(GEO 1, 2, 3, 5, 7) (CO 1-12)

The student will choose an electronic journal article or an article in an educational website for the Electronic information literacy RDT 204 writing assignment. The paper should include the following components:

1. **Summary of the article using a minimum of five APA formatted citations.**
2. **Explanation of three substantiated lessons learned through the conduction of**

- research.
3. **Rationale for choosing the topic.**
 4. **Correlation of the topic selected to course learning objectives through the documentation of specific examples.**

The student will research the topic for electronic resources in the WWCC database and on the World Wide Web. **WIKIPEDIA IS NOT AN ACCEPTABLE RESOURCE.** Students will provide a minimum of one electronic resource relevant to this topic and write a 1000 word minimum and 1500 word maximum, double-spaced paper. The paper should include a cover page and a works cited page (this is not part of the 1000 word requirement). Students are to follow APA format for citations which should be included throughout the writing assignment. Refer to the grading rubric for the writing assignment evaluation criteria.

The Electronic/Information Literacy writing assignment is **Due Sunday October 16, 2011 by 12:00 am (midnight) EST** as an attachment in messages of Blackboard. **NO LATE PAPERS WILL BE ACCEPTED. FAILURE TO SUBMIT THE PAPER BY Sunday October 16, 2011 12:00 am EST WILL EARN A 0.**

The following are considered appropriate topics for the RDT 204 Paper:

1. Patient Dose/Occupational Dose attributed to specific imaging procedures
2. Digital Imaging Principles/Effects upon Exposure
3. Pediatric Dose Considerations
4. Imaging the pregnant patient
5. Radiation induced Cancer

The following is a list of Radiologic Technology electronic resources which may be used for the RDT 204 Paper:

1. <http://www.appliedradiology.com/>
2. <http://www.auntminnie.com/index.aspx?sec=def>
3. <http://www.diagnosticimaging.com/home>
4. <http://www.medscape.com/radiology/journals>
5. <http://www.radiologyinfo.org/>
6. <http://www.radiologytoday.net/>
7. <http://www.rtstudents.com/>
8. <https://www.arrt.org/>
9. <https://www.asrt.org/>

The Electronic/Information Literacy assignment is a college requirement. Students who fail to submit the paper or do not submit by the due date will receive a 0 for the assignment and a 5% deduction from the RDT 204 Principles of Exposure III course final grade.

If you wish to have additional help on an essay, you may schedule an appointment with a writing conference instructor by going to www.worwic.edu and clicking on “Current Students” and then “Learning Resources” and “Writing Conferences.” Limited time slots are available, so an appointment is required. If you cannot keep your appointment, it is your responsibility to cancel any writing conferences by using this link. Writing Conferences are located in AAB 216.

Writing

Conferences hours are:

Mondays	3:00-6:00 pm
Tuesdays	3:00-6:00 pm
Wednesdays	11:00 am-2:00 pm.

Students may submit a completed draft paper to the course instructor for critique and feedback two weeks before the scheduled due date. Papers must have citations, a works cited page, title page, and exhibit APA format for evaluation. The course instructor will not provide feedback on any incomplete paper draft. Students are permitted one review of the paper before submission. Writing assignments which do not include all paper components will not be reviewed in draft form by the course instructor. Paper drafts will not be evaluated by the course instructor before the start of the fall semester.

Students are required to submit the electronic information literacy assignment in a digital format through blackboard. The paper must be submitted in a Microsoft Word compatible document. Papers will not be accepted in hard copy form.

WWCC TESTING CENTER

RDT students will complete chapter tests in the WWCC Testing Center. According to the testing center policies, students must do the following when entering the center to complete a test or quiz:

1. Present a current school or government-issued photo ID.
2. Provide the name of the instructor teaching the course.
3. Provide the course name and section number.

4. Identify the name of the test.
5. Turn off cell phones and any electronic devices.

The testing center maintains a roster of students completing each RDT test and will document date and time the student enters and exits the testing center. Students will be given two hours to complete each St. Catherine Test.

Students will be provided additional information/instructions about the St. Catherine Registry Review tests before the due dates.

The testing center is located in AAB 226. The following are the hours of operation for the testing center:

Sundays	Closed
Mondays	10:00 am to 8:00 pm
Tuesdays	10:00 am to 8:00 pm
Wednesdays	10:00 am to 8:00 pm
Thursdays	10:00 am to 8:00 pm
Fridays	10:00 am to 3:00 pm
Saturdays	12:00 pm to 5:00 pm

Students are required to plan accordingly to complete tests and assignments based upon the testing center schedule.

QUIZZES (GEO 1, 2, 3, 4, 5, 7, 8) (CO 1-12)

Quizzes will be administered throughout the semester to measure the student's comprehensive knowledge of course concepts. Students may complete quizzes at home or on campus. All quizzes have a 15-minute time limit. Quizzes will be administered through Blackboard. Quizzes will cover information from RDT 104, RDT 154, and RDT 204. **NO MAKE-UP QUIZZES WILL BE ADMINISTERED. FAILURE TO COMPLETE ANY QUIZ WITHIN THE DATES/TIMES AVAILABLE WILL RESULT IN A GRADE OF 0 FOR THE QUIZ.**

TESTS (GEO 1, 2, 3, 4, 5, 7, 8) (CO 1-12)

Chapter tests will be administered throughout the semester. Three tests will be administered in RDT 204. Tests are completed in the testing center and are in a paper/pencil format. All tests have a 3-hour time limit. **NO MAKE-UP TESTS WILL BE ADMINISTERED. STUDENTS ARE REQUIRED TO COMPLETE TESTS AT THE TESTING CENTER DURING THE DATES/TIMES AVAILABLE. FAILURE TO COMPLETE ANY TEST WITHIN THE DATES/TIMES AVAILABLE WILL RESULT IN A GRADE OF 0 FOR THE TEST.**

COMPREHENSIVE FINAL EXAMINATION (GEO 1, 2, 3, 4, 5, 7, 8) (CO 1-12)

The comprehensive final examination will cover all information from RDT 104, RDT 154, and RDT 204. The comprehensive final examination will be administered in a paper/pencil format on Wednesday December 14, 2011. **NO MAKE-UP FINAL WILL BE ADMINISTERED.**

EMERGENCY INFORMATION:

In the event of a flu epidemic or other emergency that results in the suspension of classes, faculty will be communicating with students about their courses and course requirements, such as assignments, quiz and exam dates, and class and grading policies, via faculty websites or Blackboard. Students will be responsible for completing all these assignments in accordance with class policies. Information about the resumption of classes will be communicated via the College's website and email system.

RDT students are responsible for all assignments and due dates outlined in the course syllabus regardless if the college has been closed due to an emergency.

COURSE EVALUATION

Assignments	10%
- Paper	
- Technique Book	
- Exposure Experiment	
- Exposure Project	
- Mosby's Workbook	
- Discussion Questions	
- Radreview Tests	
Quizzes	10%
Tests	30%
Comprehensive Final Exam	50%

Grading Scale

A	93 – 100
B	84 – 92
C	75 – 83
D	66 – 74
F	0 – 65

A FINAL GRADE BELOW A 75.0% RESULTS IN COURSE FAILURE AND DISMISSAL FROM THE RADIOLOGIC TECHNOLOGY PROGRAM. GRADES ARE NOT ROUNDED.

A FINAL GRADE OF 74.9% WILL RESULT IN COURSE FAILURE AND DISMISSAL FROM THE RADIOLOGIC TECHNOLOGY PROGRAM.

Discussion Post Grading Rubric

Criteria (10 Total Points)	0 Non-performance	1 Basic	2 Proficient
Spelling	Three or more spelling errors in the discussion post.	One to two spelling errors are present in discussion post	Discussion post is free of spelling errors.
Grammar/Sentence Structure	Three or more grammatical and/or sentence structure errors in the discussion post.	One to two grammatical/ sentence structure errors present in the discussion post.	Discussion post is free of grammatical or sentence structure errors.
Length	Discussion post is less than 300 words.		Discussion post adheres to the 300 word length requirement.
Summarize electronic article and explain relevance of article to course objectives.	Does not provide adequate summary of article and/or provide relevance of article to course objectives.		Summarizes the electronic article and explains relevance of article to course objectives.
Lessons Learned	Does not explain two lessons learned.		Explain two lessons learned from the electronic article.

RDT 204 Electronic Information Literacy Principles of Exposure III Paper Grading Rubric

Criteria (24 Total Points)	0 Non-performance	2 Basic	3 Proficient
Spelling	More than three spelling errors are present throughout the paper.	No more than three spelling errors are present.	Paper is free of spelling errors.
Grammar/Sentence Structure	Does not demonstrate coherent sentence structure or knowledge of grammatical rules as expressed in the English Language.	No more than three Grammatical or Sentence structure errors are noted.	Paper is free of grammatical and sentence structure errors. Language is concise and easily understood by the reader.
Length	Paper has less than 1000		Paper has a minimum of 1000

	words.		words. The word count DOES NOT include the title or works cited page This is CONTENT only.
Content	Does not summarize the article using a minimum of five APA formatted citations. The correlation of the article with radiation protection/radiobiology learning objectives is not clearly defined and/or examples not provided.	.	Summarizes the article with a minimum of five APA formatted citations. Explains the importance of the article to principles of exposure learning objectives by providing a minimum of three specific examples.
Explains rationale for choosing topic.	Does not explain rationale for choosing topic.		Explains rationale for choosing topic by documenting a correlation between topic and content covered in lecture.
Describes lessons learned.	Does not describe lessons learned and/or describes less than three specific lessons learned from the article.		Describes a minimum of three specific lessons learned from the article.
Works cited in APA Format	Does not provide reference in APA format.		Electronic resource provided in APA format.
Paper Components	Paper does not include a title page, 1000 words of content, and works cited page.		Paper includes a title page, a minimum of 1000 words of content, and a works cited page.

RDT 204: Exposure Technique Book Grading Rubric

Criteria (20 Total Points)	0 Non-performance	2 Proficient
Exam and projections for personal body habitus	All exams and projections not documented for personal body habitus.	All exams and projections are documented according to personal body habitus.
Exam and projections for two different body habitus	All exams and projections not documented for two additional body habitus which differs from the student's personal body habitus.	All exams and projections are documented for two additional body habitus which differs from the student's personal body habitus.
Manual Techniques	All required criteria not	Manual techniques are documented using

	documented for manual techniques.	kVp, mAs, FSS, IR, Grid, and SID.
AEC Techniques	All required criteria not documented for AEC techniques.	AEC techniques are documented using kVp, mA, FSS, IR, photocells, and SID.
Organization	Technique book is not organized alphabetically.	Alphabetical organization, information easy to locate.
Clinical Site	Clinical site is not documented by each exposure technique.	Clinical site documented by each exposure technique.
Clinical Instructor Authorization	Clinical instructor did not initial all exposure techniques for accuracy.	Clinical instructor initialed all exposure techniques for accuracy.
Applicable to a licensed technologist	Technique book is not applicable to the licensed Radiologic Technologist and cannot be used after graduation.	Technique book is applicable to the licensed Radiologic Technologist and can be used after graduation.
Clarity	Exposure technique book is not easy to read and will be difficult to obtain a technique quickly for the performance of an imaging exam.	Exposure technique book is clear and easy to read to locate a technique quickly for the performance of an imaging exam.
Creativity	Exposure technique book does not demonstrate creativity.	Exposure technique book uses creativity to document information applicable to the licensed practitioner.

Exposure Technique Book Content (Techniques for All projections for each exam series)

- | | | |
|----------------------|------------------|--------------|
| CXR PA/LAT | FEMUR | MANDIBLE |
| PCXR | HIP (AP/LAT M&A) | NASAL BONES |
| ABDOMEN SUPINE (M&A) | PELVIS (M&A) | FACIAL BONES |
| ABDOMEN ERECT (M&A) | C-SPINE (M&A) | |
| FINGER | T-SPINE (M&A) | |
| THUMB | L-SPINE (M&A) | |
| HAND | SACRUM/COCCYX | |
| WRIST | RIBS | |

ELBOW
 HUMERUS
 SHOULDER (M&A)
 TOES
 FOOT
 ANKLE
 CALCANEUS
 TIB/FIB
 KNEE (M&A)

STERNUM
 ESOPHAGRAM
 UGI
 SBFT (M&A)
 BE
 BE DECUBITUS (M&A)
 LATERAL RECTUM (M&A)
 SKULL (M for AP and Lat and A)
 SINUSES

M = Manual Technique

A = AEC

RDT 204: Group Exposure Experiment

Criteria (16 Total Points)	0 Non-performance	2 Proficient
Phantom Utilization	Four specific x-ray phantoms were not utilized for the exposure experiment.	Create an exposure experiment utilizing a minimum of four specific x-ray phantoms.
Specific Instructions	Instructions were not clearly defined for the student to complete the experiment.	Instructions for the experiment are clearly defined with each step explained.
Lessons Learned	Ten specific lessons learned from the conduction of the experiment were not documented.	Explain ten specific lessons the RDT student will learn through the conduction of the experiment.
Objectives Defined	Five specific objectives were not	Define five specific objectives the student

	defined as part of the experiment.	should understand at the completion of the exposure experiment.
Components	Experiment does not contain a minimum of five specific content areas the RDT student should complete in the clinical setting.	Experiment contains a minimum of five specific content areas the RDT student should complete in the clinical setting.
Written Documentation	Paper does not follow the 750 word minimum.	Group submits a written description of all aspects of the experiment in a 750 word minimum paper.
Images	CD does not include all five specific experiment content areas.	CD submitted with images of all five specific experiment content areas.
Bridging classroom to clinic	Group does not explain the results of the experiment and the correlation with didactic theories and clinical practice.	Group explains the results of the five specific experiment content areas and the correlation with didactic theories with clinical practice.

RDT 204: Phantom Patient Project

Criteria (14 Total Points)	0 Non-performance	2 Proficient
Construction	Does not utilize the 15 specific items to construct the phantom patient.	Group utilizes a minimum of 15 specific items to construct the phantom patient.
Written Documentation	Does not submit the 500 word minimum paper.	Group submits a written description of the phantom construction in a 500 word minimum paper.
Images	CD is not submitted and/or three specific projections were not completed on the phantom patient.	CD submitted with a minimum of three images in different anatomical projections to demonstrate beam attenuation qualities.

Creativity	Group does not demonstrate a creative collaborative effort in the construction of the phantom patient.	Group demonstrates a creative collaborative effort in the development of the phantom patient and utilizes materials which demonstrate various beam attenuation characteristics learned in the classroom.
Pathology	Phantom patient does not demonstrate an additive and destructive pathology demonstrated on radiographic images.	Phantom patient demonstrates an additive and destructive pathology which is explained in the written paper.
Lessons Learned	Group does not document five specific lessons learned as the result of the patient phantom construction.	Group documents five specific lessons learned.
Classroom to Clinic Connection	Group does not explain the connection between didactic theories and clinical practice.	Group explains the connection between didactic theories learned in the classroom and the clinical application of the construction of the phantom patient.

RDT 204: Principles of Exposure III

<u>DATES</u>	<u>COURSE WORK</u>	<u>ASSIGNMENTS</u> <u>ASSESSMENTS</u>	<u>DUE DATES</u>
WK 1 Sept 7 – Sept 11	Read Chapters 1 and 2 in Digital Radiography and PACS Book Review PowerPoint Presentation Chapters 1 and 2	Discussion Question Post – Technology and Social Networking	DQ Post Due 9/11/11 12:00 am EST

WK 2 Sept 12 – Sept 18	Read Chapters 3 and 4 in Digital Radiography and PACS Book Review PowerPoint Presentation Chapters 3 and 4	Discussion Question Post – PACS and CT Dose Monitoring Quiz 1 Chapters 1 and 2	DQ Post Due 9/18/11 12:00 am EST Quiz 1 Available 9/12/11 and due 9/18/11 at 12:00 am midnight EST
WK 3 Sept 19 – Sept 25	Read Chapters 5 and 6 in Digital Radiography and PACS Book Review PowerPoint Presentation Chapters 5 and 6	Discussion Question Post – Importance of Patient History Radreview Easy (150) Questions Image Production and Evaluation Quiz 2 Chapters 3 and 4	DQ Post Due 9/25/11 12:00 am EST (150) Radreview Questions Due 9/25/11 12:00 am EST Quiz 2 Available 9/19/11 and due 9/25/11 at 12:00 am midnight EST
WK 4 Sept 26 – Oct 2	Read Chapters 7, 8, 9 in Digital Radiography and PACS Book Review PowerPoint Presentation Chapters 7, 8, 9	Radreview Easy (150) Questions Image Production and Evaluation Quiz 3 Chapters 5 and 6	(150) Radreview Questions Due 10/2/11 12:00 am EST Quiz 3 Available 9/26/11 and due 10/2/11 at 12:00 am midnight EST
<u>DATES</u>	<u>COURSE WORK</u>	<u>ASSIGNMENTS</u> <u>ASSESSMENTS</u>	<u>DUE DATES</u>
WK 5 Oct 3 – Oct 9	Read Chapters 10, 11,12 in Digital Radiography and PACS Book Review PowerPoint Presentation Chapters 10, 11, 12	Discussion Question Post – Digital Mammography	DQ Post Due 10/9/11 12:00 am EST

WK 6 Oct 10 – Oct 16	TEST REVIEW	TEST ONE Paper	TEST ONE <u>Available 10/10/11 at 10:00 am until 10/13/11 at 8:00 pm.</u> Paper Due 10/16/11 12:00 am EST
WK 7 Oct 17 – Oct 23	Read Chapter 40 Fluoroscopy in Principles of Radiographic Exposure Book Review PowerPoint Presentation Chapter 40	Discussion Question Post- Image Gently Fluoroscopy Campaign	DQ Post Due 10/23/11 12:00 am EST
WK 8 Oct 24 – Oct 30	Read Chapter 41 Conventional Tomography in Principles of Radiographic Exposure Book Review PowerPoint Presentation Chapter 41, Special Imaging Techniques, Image Analysis	Quiz 4 Fluoroscopy	Quiz 4 Available 10/24/11 and due 10/30/11 at 12:00 am midnight EST
WK 9 Oct 31 – Nov 6	TEST REVIEW	TEST TWO	TEST TWO <u>Available 10/31/11 at 10:00 am until 11/2/11 at 8:00 pm.</u>
WK 10 Nov 7 – Nov 13	Exposure Review RDT 104 and RDT 154 Concepts Review PowerPoint Presentation	Mosby's WKBK	Mosby's WKBK Due 11/13/11 12:00 am EST
<u>DATES</u>	<u>COURSE WORK</u>	<u>ASSIGNMENTS</u> <u>ASSESSMENTS</u>	<u>DUE DATES</u>
WK 11 Nov 14 – Nov 20	Exposure Review RDT 104 and RDT 154 Concepts Review PowerPoint Presentation	Radreview Easy (150) Questions Image Production and Evaluation	(150) Radreview Questions Due 11/20/11 12:00 am EST

WK 12 Nov 21 – Nov 27	Exposure Review RDT 104 and RDT 154 Concepts Review PowerPoint Presentation	Exposure Technique Book Quiz 6 Exposure Review	Exposure Technique Book due 11/21/11 4:30 pm Quiz 6 Available 11/21/11 and due 11/27/11 at 12:00 am midnight EST
WK 13 Nov 28 – Dec 4	Exposure Review RDT 104 and RDT 154 Concepts Review PowerPoint Presentation	Phantom Project	Phantom Project CD due 11/28/11 4:30 pm EST Phantom Project written document due 11/28/11 12:00 am midnight
WK 14 Dec 5 – Dec 11	TEST REVIEW	TEST THREE Exposure Experiment	<u>TEST THREE</u> <u>Available Dec 6, 2011 at</u> <u>10:00 am until Dec 8, 2011</u> <u>at 8:00 pm.</u> Exposure Experiment CD due 12/5/11 4:30 pm EST Exposure Experiment written document due 12/5/11 12:00 am midnight
Dec 14, 2011	Comprehensive Final Examination		