LBCC Diagnostic Imaging Program

**DI 122 EXPOSURE III**

Winter 2019

**Instructor:** Jennifer Clayton, R.T. MBA (R)(CT)(ARRT)

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**Lebanon Office Phone:** 541-451-6310

**Lecture Location:** [Virtual Classroom](https://zoom.us/j/9519289278)

**Lecture Times:** Mondays and Wednesday 11:00 a.m.-12:15 p.m.

**Office Hours:** By appointment; please [email](mailto:claytoj@linnbenton.edu) to set up a mutually convenient time

**REQUIRED TEXT (PROVIDED)**

**Principles of Radiographic Imaging** by Richard Carlton & Arlene Adler

**Radiologic Science for Technologists 11e** by Stewart Bushong

**SCHEDULE:**

* **Class** is held in **real time** in the LIVE [Virtual Classroom](https://zoom.us/j/9519289278) **Mondays and Wednesday 11:00 am to 12:15 pm**. It is expected students will attend all lectures.
* **Interaction during lecture is an integral part of the each lecture and cannot be substituted.**
  + Attendance and participation will both be scored as part of your final evaluation this term. Tardies, not being present in class when called upon and/or missing all or portions of a class will result in a lower score in the “Punctuality and Attendance” category on your final evaluation.
* **Assignments**  will occur in each module during the term. There may also be project assignments that will be assigned and which will require work in the lab or health care facility. Assignments are expected to be submitted for grading by Fridays at 11:59 p.m.
* **Quizzes** will be given **during each class session**. Quizzes will be a review of content including lecture, homework, assignments and **reading**.
* The **final exam** will be scheduled for **the week of March 18th.**

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| **STUDENT EXPECTATIONS**   * **YOU are RESPONSIBLE for your own LEARNING.** * **We provide the structure for that learning, but it is up to you to decide how much or little you get out of the class.** * **LBCC faculty provides the classroom lecture portion of the course.** * **Each student is expected to spend extra time studying on his/her own.** * **There are specific deadlines, so this course is not self-paced. It is up to the student to keep up with his/her assignments and deadlines.** * **Issues with technology are not valid reasons for turning in late work.** * **No late work is ever accepted.** |

**COURSE DESCRIPTION:**

Content is designed to impart an understanding of the components, principles, and operation of digital imaging systems found in diagnostic radiology. Factors that impact image acquisition, display, archiving, and retrieval are discussed. Guidelines for selecting exposure factors and evaluating images within a digital system assist students to bridge between film-based and digital imaging systems. Principles of digital system quality assurance and maintenance are presented.  The content also provides a basic knowledge of quality control. Content is designed to establish a knowledge base in factors that govern the image production process. Content is designed to establish a knowledge base in radiographic, fluoroscopic, mobile, and tomographic equipment requirements and design. **This course is also designed as a review course regarding material from previous terms.**

**ASRT COURSE OBJECTIVES:**

* Describe the effects of storage on image quality.
* Describe the function of components which make up the digital receptor systems.
* Explain latent image formation.
* Describe the features of the characteristic curve and explain its purpose.
* Select the most appropriate image receptor to be used for given clinical situations.
* Identify procedures that ensure a long screen life devoid of artifacts and distortion.
* Identify types of image artifacts and analyze them to determine the cause.
* Define terminology associated with digital imaging systems.
* Define digital imaging and communications in medicine.
* Describe the histogram and the process of histogram analysis as it relates to automatic

rescaling and determining an exposure indicator.

* Employ appropriate beam/part/receptor alignment to avoid histogram analysis errors.
* Associate impact of image processing parameters to the image appearance.
* Summarize the relationship of factors affecting exposure latitude.
* Formulate a procedure or process to minimize histogram analysis and re-scaling errors.
* Evaluate the effect of a given exposure change on histogram shape, data width and image

appearance.

* Examine the potential impact of digital radiographic systems on patient exposure and

methods of practicing the as low as reasonably achievable concept with digital systems.

* Identify common limitations and technical problems when using PSP systems.
* Describe the response of PSP systems to background and scatter radiation.
* Describe the conditions that cause quantum mottle in a digital image.
* Evaluate the spatial resolution and dose effectiveness for digital radiography detectors.
* Evaluate the effects of scattered radiation on the image.
* Summarize the relationship of factors affecting scattered and secondary radiation.
* Describe picture archival and communications system (PACS) and its function
* Identify components of PACS.
* Identify common problems associated with retrieving/viewing images within a PACS.

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| **Week/ Module** | **Date** | **Topic** | **Required**  **Reading** | **Homework** | **Assignment** | **Assessment** |
| 1 | M 1/7 & W 1/9 | Basics of Digital Imaging | Bushong  Chapter: 14  Carlton: 323-339 | HW 1 | Assignment 1 due by  **FRI 1/11 @ 11:59 PM** | **Quiz 1 WED 1/9** |
| 2 | M 1/14 & W 1/16 | Creating the Digital Image: CR | Bushong  Chapter: 15 Carlton: 339-344 | HW 2 | Assignment 2 due by  **FRI 1/18 @ 11:59 PM** | **Quiz 2-1 MON**  **Quiz 2-2 WED 1/16** |
| 3 | **M 1/21**  **NO LIVE CLASS** &  W 1/23 | Creating the Digital Image: DR | Bushong  Chapter: 16  Carlton 353-358 | HW 3 | Assignment 3 due by  **FRI 1/25 @ 11:59 PM** | **QUIZ 3-1 NO QUIZ**  **Quiz 3-2 WED 1/23** |
| 4 | M 1/28 & W 1/30 | CR & DR Digital Image Processing | Carlton: Chapter 23 | HW 4 | Assignment 4 due by  **FRI 2/1 @ 11:59 PM** | **Quiz 4-1 MON 1/28**  **Quiz 4-2 WED 1/30** |
| 5 | M 2/4 &  **W 2/6**  **NO LIVE CLASS** | Digital Imaging Post Processing-High school career week | Bushong  Chapter: 18 | HW 5 | Assignment 5 due by  **FRI 2/8 @ 11:59 PM** | **Quiz 5-1 MON 2/4**  **Quiz 5-2 NO QUIZ** |
| 6 | M 2/11 & W 2/13 | Applying Radiographic Techniques | Bushong  Chapter: 17 | HW 6 | Assignment 6 due by  **FRI 2/15 @ 11:59 PM** | **Quiz 6-1 MON 2/11**  **Quiz 6-2 WED 2/13** |
| 7 | **M 2/18-**  **NO LIVE CLASS**  W 2/20 | Artifacts | Bushong  Chapter: 21 | None | Assignment 7 due by  **FRI 2/22 @ 11:59 PM** | **Quiz 7-1 NO QUIZ**  **Quiz 7-2 WED 2/20** |
| 8 | M 2/25 & W 2/27 | PACS & QC | Bushong  Chapter: 22  Carlton  Chapter: 24 | HW 8 | Assignment 8 due by  **FRI 3/1 @ 11:59 PM** | **Quiz 8-1 MON 2/25**  **Quiz 8-2 WED 2/27** |
| 9 | M 3/4 &  W 3/6 | Exposure I & II Review | Review | HW 9 | Assignment 9 due by  **FRI 3/8 @ 11:59 PM** | **None** |
| 10 | M 3/11 & W 3/13 | Exposure III Review & Image Critique | Review | HW 10 | None | **None** |
| 11 | **3/18** | Finals Week | All reading assignments to date | None | None | **Final Exam** |

**QUIZZES (5-25 points each)**

There will be scheduled quizzes. These will generally cover the material from the previous lectures, homework and/or assignments. Quizzes are closed note/book and are taken on the designated assessment day and time. All students are expected to take Quizzes with integrity, jeopardizing neither their own work, nor that of others. **Pop quizzes may be given at any time over any material at the instructor’s discretion.**

**ASSIGNMENTS (10-50 points)**

Various assignments will occur during the term. There are also project assignments that may be assigned that will require work in the lab or health care facility. Each assignment is worth points that vary depending upon the task.

**HOMEWORK: (0 points)**

The homework assignments are NOT graded. Consider them an additional resource. The homework assignments allow the student to determine how well they understand the material and give students practice before an assessment. Students who dutifully complete ungraded HW perform better in the course. The homework consists of Online Digital Imaging Academy Modules (ODIA) and questions based off of the modules. **PLEASE NOTE: These modules may not display on a MAC computer make sure you enable adobe flash player. Often students will review these together in Zoom.**

**WRITTEN FINAL EXAM (200 POINTS)**

The final exam will be comprehensive for all three sections of Exposure and will consist of 100 ARRT type multiple choice questions. The homework questions definitely help you study for the final. The exam will take place during finals week at a designated time.

**GRADING SCALE:**

A = 91.5 - 100%

B = 82.5 - 91.4%

C = 74.5 - 82.4%

FAIL = < 74.4%

Less than 74.4% will result in the student failing the program and receiving a letter grade of F on their transcripts. The Diagnostic Imaging Program does not utilize the grade of D.

**Syllabus Change Policy**

Syllabus is subject to change as the instructor evaluates the progress of students and their understanding of concepts.

**Course Failure Policy**

If a student fails this course, he or she must withdraw from the program.

**Discrimination Policy**

LBCC prohibits unlawful discrimination based on race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, marital status, disability, veteran status, age, or any other status protected under applicable federal, state, or local laws. For further information visit<http://po.linnbenton.edu/BPsandARs/>.

**Disability Services Policy**

You should meet with your instructor during the first week of class if:

* You have a documented disability and need accommodations,
* Your instructor needs to know medical information about you, or
* You need special arrangements in the event of an emergency.

If you have documented your disability, remember that you must make your request for accommodations through the Center for Accessibility Resources Online Services web page every term in order to receive accommodations. If you believe you may need accommodations, but are not yet registered with CFAR, please go to <http://linnbenton.edu/cfar> for steps on how to apply for services or call 541-917-4789

**Statement of Inclusion**

The LBCC community is enriched by diversity. Everyone has the right to think, learn, and work together in an environment of respect, tolerance, and goodwill. I actively support this right regardless of race, creed, color, personal opinion, gender, sexual orientation, or any of the countless other ways in which we are diverse. (Related to Board Policy #1015)