

UNIVERSITY OF NEVADA LAS VEGAS

Department of Health Physics and Diagnostic Sciences

RAD354 Digital Radiographic Techniques and Practices

Fall 2021

Class Instructor:

Time:

Class Location:

Office Location:

Office Hours:

Phone:

WebCampus:

Email:

Note: The instructor reserves the right to make changes to syllabus as she deems necessary, to include reading assignments.

Course Description:

Provides a foundation for understanding digital imaging technology, digital imaging receptors, digital technique, image acquisition and post-processing enhancement. Best practices in digital radiography and radiation safety in a digital environment will be stressed. The content includes studies of technique factor changes, the effects of image processing, and digital quality control. Digital radiographic image analysis is discussed and explored.

Course Prerequisite(s):

None

Course Objectives:

1. Explain Radiation protection and dosimetry
2. Understand exposure systems and formulate a technique chart
3. Define pre and post processing features
4. Assess image receptor exposure, grayscale, spatial resolution, and distortion
5. Identify digital artifacts
6. Explain quality control and quality management of digital systems
7. Explain image analysis guidelines

8. Describe digital imaging guidelines
9. Understand the best practices in digital radiography
10. Explain threshold and non-threshold dose

Required Material:

Essential of Radiographic Physics and Imaging 3rd ed. (Johnston, Fauber)

Digital Radiography in Practice 1st ed. (Carroll)

Evaluation Methods:

- Each student will accumulate several hundred points in this course predicated on:
 - a. Persuasive Papers (30% of total grade)
 - b. In class tests (50% of total grade)
 - c. Assignments (20% of total grade)

Grading Scale:

The student's final grade will be based on their percentage of total points given. Grade determination is based on the following percentage:

A	93.4 – 100%
A-	90.1 – 93.3%
B+	86.7 – 90%
B	83.4 – 86.6%
B-	80.1 – 83.3%
C+	76.7 – 80%
C	73.4 – 76.6%
C-	70.1 – 73.3%
D+	66.7 – 70%
D	63.4 – 66.6%
D-	60.1 – 63.3%
F	60% and below

Attendance Policy:

Students are expected to attend class and be one time. Class will start at the designated time offered. A student may accrue two excused absences throughout the semester. Additional absences or excessive tardiness will result in a deduction in their overall grade.

Cell Phone Policy:

All cell phones will be kept off while in class. Cell phones, while an important part of our culture, are very distracting if heard or used in class. If the instructor finds a student talking or texting during class they will be asked to leave and receive an absence for the day. Any use of a cell phone or electronic device during a quiz or test will be considered cheating and the student will receive a "0" for the quiz or test.

UNLV POLICIES:

Public Health Directives

Face coverings are mandatory for all faculty and students. Students must follow all active UNLV public health directives while enrolled in this class.

UNLV public health directives can be found [here](#). Students who do not comply with these directives WILL be asked to leave the classroom. Refusal to follow the guidelines may result in further disciplinary action according to the [UNLV Code of Student Conduct](#), including being administratively withdrawn from the course. It is also recommended that students download the RebelSafe app and perform a self-check, using the COVID-19 assessment tool, before arriving on campus.

Academic Misconduct

Academic integrity is a legitimate concern for every member of the Campus community; we all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility, and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy, and are encouraged to always take the ethical path whenever faced with choices. Students enrolling at UNLV assume the obligation to conduct themselves in a manner compatible with UNLV's educational mission. An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another person, from the Internet or any other source without proper citation of the sources. See the [Student Code of Conduct](#).

Auditing Classes

Auditing a course allows a student to continue attending the lectures and/or laboratories and discussion sessions associated with the course, but the student will not earn a grade for any component of the course. Students who audit a course receive the same educational experience as students taking the course for a grade, but will be excused from exams, assessments, and other evaluative measures that serve the primary purpose of assigning a grade.

Classroom Conduct

Students have a responsibility to conduct themselves in class and in the libraries in ways that do not interfere with the rights of other students to learn or of instructors to teach. Use of electronic devices such as pagers, cellular phones, or recording devices, or potentially disruptive devices or activities, are only permitted with the prior explicit consent of the instructor. The instructor may rescind permission at any time during the class. If a student does not comply with established requirements or obstructs the functioning of the class, the instructor may initiate an administrative drop of the student from the course.

Copyright

The University requires all members of the University Community to familiarize themselves with, and to follow copyright and fair use requirements. You are individually and solely responsible for violations of copyright and fair use laws. The University will neither protect nor defend you, nor assume any responsibility for employee or student violations of fair use laws. Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional copyright policy information is available at the [UNLV Provost Office](#)

Disability Resource Center (DRC)

The [UNLV Disability Resource Center](#) (SSC-A, Room 143, 702-895-0866) provides resources for students with disabilities. Students who believe that they may need academic accommodations due to injury, disability, or due to pregnancy should contact the DRC as early as possible in the academic term. A Disabilities Specialist will discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours, so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

Final Examinations

The University requires that final exams given at the end of a course occur on the date and at the time specified in the Final Exam schedule. The general schedule is typically available at the start of the semester, and the classroom locations are available approximately one month before the end of the semester. See the Final Exam Schedule, [here](#).

Identity Verification in Online Courses

All UNLV students must use their Campus-issued ACE ID and password to log in to WebCampus.

UNLV students enrolled in online or hybrid courses are expected to read and adhere to the [Student Academic Misconduct Policy](#), which defines, “acting or attempting to act as a substitute for another, or using or attempting to use a substitute, in any academic evaluation or assignment” as a form of academic misconduct. Intentionally sharing ACE login credentials with another person may be considered an attempt to use a substitute and could result in investigation and sanctions, as outlined in the Student Academic Misconduct Policy.

UNLV students enrolled in online courses are also expected to read and adhere to the [Acceptable Use of Computing and Information Technology Resources Policy](#), which prohibits sharing university accounts with other persons without authorization.

To the greatest extent possible, all graded assignments and assessments in UNLV online courses should be hosted in WebCampus or another UNLV-managed platform that requires ACE login credentials for access.

Incomplete Grades

The grade of "I" (Incomplete) may be granted when a student has satisfactorily completed three-fourths of course work for that semester/session, but cannot complete the last part of the course for reason(s) beyond the student's control and acceptable to the instructor, and the instructor believes that the student can finish the course without repeating it. For undergraduate courses, the incomplete work must be made up before the end of the following regular semester. Graduate students receiving "I" grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the period indicated, a grade of "F" will be recorded, and the student's GPA will be adjusted accordingly. Students who are fulfilling an Incomplete grade do not register for the course, but make individual arrangements with the instructor who assigned the "I" grade.

Library Resources

Librarians are available to consult with students on research needs, including developing research topics, finding information, and evaluating sources. To make an appointment with a subject expert for this class, please visit the Libraries' Research Consultation website:

<http://guides.library.unlv.edu/appointments/librarian>. You can also ask the library staff questions via chat and text message at: <http://ask.library.unlv.edu/>.

Missed Classwork

Any student missing class, quizzes, examinations, or any other class or laboratory work because of observance of religious holidays will be given an opportunity during that semester to make up the missed work. The make-up opportunity will apply to the religious holiday absence only. It is the responsibility of the student to notify the instructor within the first 14 calendar days of the course for Fall and Spring courses (except for modular courses), or within the first 7 calendar days of the course for Summer and modular courses, of their intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit the Policy for Missed Work, under Registration Policies, on the Academic Policies webpage, <https://catalog.unlv.edu/content.php?catoid=6&navoid=531>.

In accordance with the policy approved by the Faculty Senate regarding missed class time and assignments, students who represent UNLV in any official extracurricular activity will also have the opportunity to make up assignments, provided that the student provides official written notification to the instructor no less than one week prior to the missed class(es).

The spirit and intent of the policy for missed classwork is to offer fair and equitable assessment opportunities to all students, including those representing the University in extracurricular activities. Instructors should consider, for example, that in courses which offer a "Drop one" option for the lowest assignment, quiz, or exam, assigning the student a grade of zero for an excused absence for extracurricular activity is both contrary to the intent of the Faculty Senate's policy, and an infringement on the student's right to complete all work for the course.

This policy will not apply in the event that completing the assignment or administering the examination at an alternate time would impose an undue hardship on the instructor or the University that could reasonably have been avoided. There should be a good faith effort by both the instructor and the student to agree to a reasonable resolution. When disagreements regarding this policy arise, decisions can be appealed to the Department Chair/Unit Director, College/School Dean, and/or the Faculty Senate Academic Standards Committee.

For purposes of definition, extracurricular activities may include, but are not limited to: fine arts activities, competitive intercollegiate athletics, science and engineering competitions, liberal arts competitions, academic recruitment activities, and any other event or activity sanctioned by a College/School Dean, and/or by the Executive Vice President and Provost.

Rebelmail

Rebelmail is UNLV's official email system for students, and by University policy, instructors and staff should only send emails to students' Rebelmail accounts. Rebelmail is one of the primary ways students receive official University communications, information about deadlines, major Campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the University. Emailing within WebCampus is also acceptable.

Tutoring and Coaching

The Academic Success Center (ASC) provides tutoring, academic success coaching, and other academic assistance for all UNLV undergraduate students. For information regarding tutoring subjects, tutoring times, and other ASC programs and services, please visit the [ASC website](#), or call 702-895-3177. The ASC building is located across from the Student Services Complex (SSC). Academic success coaching is located on the second floor of SSC A, Room 254. Drop-in tutoring is located on the second floor of the Lied Library, and on the second floor of the College of Engineering building (TBE A 207).

UNLV Writing Center

One-on-one or small group assistance with writing is available free of charge to UNLV students at the [Writing Center](#), located in the Central Desert Complex, Building 3, Room 301 (CDC 3-301). Walk-in consultations are sometimes available, but students with appointments receive priority assistance. Students may make appointments in person or by calling the Center, 702-895-3908. Students are requested to bring to their appointments their Rebel ID Card, a copy of the instructions for their assignment, and two copies of any writing they have completed on their assignment.

Diversity Statement

As an institution of higher learning, UNLV represents a rich diversity of human beings among its faculty, staff, and students, and is committed to aspiring to maintain a Campus environment that values that diversity. Accordingly, the University supports understanding and appreciation of all members of its

community, regardless of race, sex, age, color, national origin, ethnicity, creed, religion, disability, sexual orientation, gender, gender identity, marital status, pregnancy, genetic information, veteran status, or political affiliation. Please see [University Statements and Compliance](#).

A successful learning experience requires mutual respect and trust between the students and the instructor. Accordingly, the instructor asks that students be willing to listen to one another's points of view, acknowledging that there may be disagreements, keep discussion and comments on topic, and use first person, positive language when expressing their perspectives.

Course Schedule:

DATE	LECTURE	CHAPTER READINGS	ASSIGNMENTS
Tuesday Jan. 18, 2022	Introduction to Radiation Protection		
Thursday Jan. 20, 2022	Radiation Monitoring and Protection		
Tuesday Jan. 25, 2022	The use of Gonadal Shielding		Shielding Discussion
Thursday Jan. 27, 2022	Early and Late Effects of Radiation Exposure		Threshold/Non-Threshold Persuasive paper DUE Wednesday March 9, 2022 @ 11:59pm
Tuesday Feb. 1, 2022	Formulating and Comparing Exposure Systems		
Thursday Feb. 3, 2022	Formulating Technique Chart		Technique Chart Due Monday Feb. 7, 2022 @11:59pm
Tuesday Feb. 8, 2022	TEST #1	TEST #1	TEST 31
Thursday Feb. 10, 2022	ACERT CONFERENCE	ACERT CONFERENCE	ACERT CONFERENCE
Tuesday Feb. 15, 2022	Preprocessing and Histogram Analysis Rescaling (Processing) the Digital Radiograph	Carroll Chapter 5 Carroll Chapter 6	Conventional Film-Screen Principles of Exposure Selection in the Digital Age DUE Feb. 16 @ 11:59pm
Thursday Feb. 17, 2022	Gradation Process	Carroll Chapter 7	Radiation Physics, Biology and Protection Due Feb. 21 @11:59pm
Tuesday Feb. 22, 2022	Detail Processing	Carroll Chapter 8	Physics Review #1 DUE Feb. 23 @ 11:59pm
Thursday Feb. 24, 2022	Operator Adjustments Monitoring and Controlling Exposure	Carroll Chapter 9 and 10	
Tuesday Mar. 1, 2022	Digital Image Acquisition	Ch. 10 RPI, Carroll Ch. 11	Image Acquisition and Quality in Digital Radiography DUE March 2, 2022 @ 11:59pm
Thursday Mar. 3, 2022	TEST #2	TEST #2	TEST #2
Tuesday Mar. 8, 2022	Displaying the Digital Image	Carroll Chapter 12	

DATE	LECTURE	CHAPTER READINGS	ASSIGNMENTS
Thursday Mar. 10, 2022	Threshold/Non-Threshold Debate		Threshold/Non-Threshold Persuasive Paper DUE (Wed March 9, @ 11:59pm)
Tuesday Mar. 15, 2022	SPRING BREAK	SPRING BREAK	SPRING BREAK
Thursday Mar. 17, 2022	SPRING BREAK	SPRING BREAK	SPRING BREAK
Tuesday Mar. 22, 2022	Best Practices in Digital Radiography		Best Practices Persuasive Paper Due May 3 @ 11:59pm
Thursday Mar. 24, 2022	Archiving patient images and information	Carroll Chapter 13	Electronic Health Records Due Mar. 28 @ 11:59pm
Tuesday Mar. 29, 2022	Quality Management in Digital Imaging (ASRT)		Quality Management in Digital Imaging Due Mar. 30 @ 11:59pm
Thursday Mar. 31, 2022	Quality Assessment procedures for digital radiology	Carroll Chapter 15	Quality Assurance Case Scenarios DUE April 4 @11:59pm
Tuesday April 5, 2022	Digital Artifacts and Troubleshooting		
Thursday April 7, 2022	TEST #3	TEST #3	TEST #3
Tuesday April 12, 2022	The art of image Critique		Physics Review #2 Due April 13 @11:59p
Thursday April 14, 2022	Image Analysis Guidelines		Obesity in Children Due April 18 @ 11:59pm
Tuesday April 19, 2022	Image Analysis		
Thursday April 21, 2022	Image Analysis Case Studies		Image Analysis Assignment Due April 25, @ 11:59pm
Tuesday April 26, 2022	Special Situations in Digital Imaging		Case Studies Due April 27 @ 11:59pm
Thursday April 28, 2022	Best Practices in Digital Radiography Debate		Best Practices paper Due Wed. April 27 @11:59pm
Tuesday May 3, 2022	Study Week	Study Week	Study Week
Thursday May 5, 2022	Study Week	Study Week	Study Week
Tuesday May 10, 2022	COMPREHENSIVE FINAL		