SALT LAKE COMMUNITY COLLEGE
Radiologic Technology Program

Course Syllabus

Course and Credit Hours: RADS 1110, 2 credits

Name of Course: Radiation Protection

Semester and Term:

Class Location and Time:

Instructor and Phone:

Office Location:

Mailbox Location:

Email Address:

Consultation Hours:

Textbook: Principles of Radiographic Imaging 6th ed. By Carlton and Adler

Required Equipment: Calculator

Link or Instructions for Accessing Online Course Materials:
Material will be posted online and will be available through your canvas link

Library Link: For a list of resources that support the program go to: http://libguides.slcc.edu/content.php?pid=16754

Prerequisite: Completion of prior semester courses per established curriculum plan.

Course Description:
Radiation protection concepts to include biological effects on living systems, radiation units, interactions with matter and radiation exposure limits. Radiation practices and standards for patients and personnel.

Diversity Statement: It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups.

SLCC Student Learning Outcomes:
SLCC is committed to fostering and assessing the following student learning outcomes in it programs and courses.

1. Acquire substantive knowledge in the intended major and throughout General Education
2. Communicate effectively
3. Develop quantitative literacies necessary for the chosen field of study
4. Think critically
5. Express themselves creatively
6. Develop civic literacy and the capacity to be community-engaged learners who act in mutually beneficial ways with community partners
7. Develop the knowledge and skills to work with others in a professional and constructive manner
8. Develop information literacy
9. Develop computer literacy

Program Outcomes:

1. Students will be clinically competent
   - Students will utilize proper radiation protection practices
   - Students will produce diagnostic quality radiographs

2. Students will demonstrate effective communication skills
   - Students will explain procedures to patients
   - Students will communicate with clinical staff

3. Students will exhibit critical thinking
   - Students will analyze radiographic image quality
   - Students will modify exams for unique situations

4. Students will model professionalism
   - Students will exhibit integrity and confidentiality
   - Students will demonstrate lifelong learning

Student Learning Outcomes:

1. Identify x-ray interactions within the body. (SLO-1,3,4)
2. Explain radiation protection concepts and equipment. (SLO-1,2,3,4)
3. Differentiate the radiation safety practices when using mobile and fluorographic radiography (SLO- 1,3,4)

Course Objectives:
Upon completion of this course, the student will be able to:
Chapter 9-Rad Protection Concepts and Equipment

- Describe the nature of ionizing radiation.
- Identify the types of biological effects of ionizing radiation.
- Identify the principal sources of ionizing radiation.
- Define the quantities and units used for measurement of radiation.
- Describe devices used to detect and measure radiation, including field survey instruments and personnel monitoring devices.

Chapter 10- Rad protection for Patients and Personnel

- Differentiate between the various advisory groups and regulatory agencies involved in developing radiation protection standards.

- Explain the concept of dose limits related to the use of radiation.
- Describe the ALARA concept.
- Explain the basic principles of reducing exposure to radiation.
- Describe techniques used to minimize radiation exposure to patients and personnel.
- Discuss the precautions that should be taken to minimize potential fetal exposures.

Chapter 11- Filtration

- Define filtration, inherent filtration, added filtration, compound filtration, compensating filtration, and total filtration.
- Explain the concept of half-value layer equivalency measurements of filtration.
- Appraise various types of filters for specific clinical situations.
- Describe the effect of filtration on the entire x-ray beam.

Chapter 13- X-ray Interactions

- Define attenuation.
- Explain the interactions between x-rays and matter in the following:
    - photoelectric absorption
    - coherent scattering
    - Compton scattering
    - pair production
    - photodisintegration
- Describe the relationship between x-ray interactions and technical factor selection.

Chapter 14- Minimizing Patient Exposure

- Explain the relationship of entrance skin exposure to other measurement points.
- Calculate mR/mAs from a calibration exposure total.
- Calculate total entrance skin exposure when given subject part thickness, SID, kVp, mAs, and an mR/mAs chart.
- Describe typical entrance skin exposures for common radiographic procedures.
- Discuss methods of reducing patient dose through effective communication.
- Describe various methods of reducing patient dose through effective positioning.
- Explain the interrelationship of the prime factors.
- Evaluate various exposure factors for the most effective methods of reducing patient dose under various clinical conditions.
- Describe an effective method of minimizing patient dose by emphasizing radiation risk factors.
- Describe an effective method of maximizing patient diagnostic information by emphasizing radiation benefit factors.
- Analyze various approaches to discussing radiation risk versus benefit with patients, physicians, and radiologists.

Chapter 32- Mobile Radiography

- Discuss special radiation protection considerations during mobile radiography.

Chapter 36- Fluoroscopy

- Describe radiation protection issues and practices during fluoroscopy.

Course Requirements:

Tests and Quizzes. As per the Student Handbook, **tests and quizzes must be taken on the day assigned at the designated time. In the event the student will miss a test or quiz, they**

must call or e-mail the instructor PRIOR **to the designated test start time. Phone messages are acceptable.** IF THE STUDENT DOES NOT CALL OR E-MAIL PRIOR TO THE TEST OR QUIZ START TIME, the student must take the test or quiz with an automatic 50% deduction.

All tests and quizzes are to be made up by or on the 1st class day the student returns. It is the student's responsibility to initiate making up tests and quizzes. If they fail to do so, they forfeit the opportunity to take the test or quiz.

Attendance. As per the Student Handbook, **attendance in class is** extremely **important. You are forming work habits and a reputation that will follow you into the professional environment. You are expected to be present for all courses and participate in planned activities. It is the responsibility of the student to obtain notes, handouts or assignments given on any missed day.** *Students who have absences in excess of 20% of total attendance time in each course will be terminated from the program*

Tardiness:
A tardy is when a student arrives after the class is scheduled to begin. After three tardies, the student will receive a written warning. A 2 point deduction off the final grade will result upon the fourth and every tardy thereafter.

Example: Student receives 95 points, an "A" final grade. 4 tardies were recorded for the semester. A 2-point deduction for the 4th tardy results in a 2-point deduction in final grade, taking the 95 points to 93 points, resulting in an "A-" final grade.

Student Responsibilities. Students are expected to complete reading assignments prior to scheduled class/lab times. Students should have completed worksheets, etc. and be prepared to discuss the material knowledgeably. If the student is having difficult in the course, it is the student's responsibility to make arrangements to meet with the Instructor. Students are expected to be self-directed and motivated in identifying their learning needs associated with the course content.

Assignments. There will be 5 quizzes and 4 tests including the final which is comprehensive. Students will also be given an assignment to create a review activity for the final, which will be graded on team work, content and creativity. The grading rubric for this assignment is on the home page of the course. Each assignment has a specific due date as noted on the course schedule. No late assignments will be accepted.

Incomplete. Students must complete all requirements and receive a C grade or higher in each course to remain in the program.

Class Procedure or Format:
The course will utilize PowerPoint, lecture, worksheets, group activities, online games, quizzes and tests.

Course Assessments:

5 quizzes at 2% each	10%
Test 1	20%
Test 2	20%
Test 3	20%
Review activity	10%
Comprehensive final	20%

Grading:

95-100	**A**	75-77	**C**
90-94	**A-**	71-74	**C-**
87-89	**B+**	67-70	**D+**
83-86	**B**	64-66	**D**
80-82	**B-**	Below 64	**E**
78-79	**C+**		

Wireless Devices in the Classroom:
The advent of technology use in the classroom as an instructional tool has caused both opportunities and distractions. Wireless devices cause individual inattentiveness and can make it difficult for others to stay focused. The following policies are in effect during class:

1. Cell phones, iPods/Pads, pagers, High-Resolution DVR Spy pens with webcam, microphones, recorders or any other wireless devices (excluding ADA authorized devices) that may distract from the class are to be silenced and/or set to vibrate mode before entering the classroom and may not be on the desk during class. This allows students to receive SLCC emergency notifications through email or text messaging alerts.

2. Wireless devices can be checked during class breaks outside the classroom.

3. You are expected to engage in discussion for the class. If you are discovered engaging in reading/texting messages, surfing the web and engaging in other computer activities not directly related to class, you will be asked to leave the class and will be counted as absent for that class session.

4. You may not record or publish information from the class without written authorization from the instructor. If used without written authorization, you will have violated "Privacy/Intellectual Property Rights".

Student Handbook:
Students must adhere to all policies and procedures of the Radiologic Technology Program as documented in the Student Handbook. It is the student's responsibility to be aware of, and follow, all requirements as listed in the Handbook.

Emergency Evacuation Procedures
In case of an emergency situation, elevators should not be used as emergency exits. All class members should exit through the nearest doors on the west side of the building, then proceed toward the round-about on the northeast side of the building. We will then verify that all students are accounted for and unharmed. Please inform your instructor if you require assistance or accommodation during an evacuation. The instructor will identify several students in the class that are willing to provide assistance. If you have a disability, please notify your instructor and fill out an Evacuation Information Form

The SLCC Department of Public Safety is using an app called the Crisis Manager to inform students and staff about Emergency Procedures. The app allows SLCC to instantly update these procedures. To download this app go to the App Store or Google Play Store, type **SchoolDude CrisisManager** in the search box and click "Get" or "Install. For questions regarding the Emergency Procedures or

downloading the app to your device, please contact [redacted]

Academic Grievance Policy

In accordance with the Salt Lake Community College Student Code of Conduct, http://www.slcc.edu/policies/docs/Student_Code_of_Conduct.pdf, the grievance policy for students with reference to academics can be found in Section III. Students are encouraged to seek resolution with the instructor(s) whenever possible.

It is the goal of the School of Health Sciences to be forthright and consistent with specific academic policies throughout divisions and programs. This policy singularly addresses academic issues and the general principles for disciplinary actions as noted in the Student Code of Conduct Section III. It should be noted it is up to the faculty's discretion to provide warning (verbal or written), suspension, or dismissal based upon program policy and severity of the issue at hand. It is realized in some health sciences programs a failing grade, as stated in the syllabus and/or policy manual, may result in program dismissal.

STEP ONE: A student has the right, as per college policy, to grieve a grade, warning (verbal or written), suspension, or dismissal received within a program of study. A student, as per policy, must make an appointment to meet with the instructor of the class. A meeting, for anything other than a final grade, should be made within ten (10) days of the incident. Final grade disputes require a meeting within 30 days of the student receiving the grade. Every effort should be made to find resolution and provide evidence from both parties with respect to the grade issued.

STEP TWO: If a resolution cannot be made, the student must request in writing five (5) business days from the date of meeting with the faculty, a committee review of the grievance to the Associate Dean of the specific division. The grievance will be reviewed by a committee consisting of three (3) to five (5) faculty outside the program in which the student is enrolled. This will include the following members, the Associate Dean and two to four faculty members outside the discipline. The Associate Dean will serve as committee chair. One faculty and the program coordinator of the program involved in the grievance can attend the procedure, as can the student with one representative. Each of these parties will only be allowed to present evidence to the committee and not vote on the issue in question. Legal representation is allowed by either party. The proceedings will be recorded for accuracy. Upon completion of the proceedings, the committee ONLY will vote on the issue(s) noted in the student's grievance. A formal letter will be provided by the committee chair within ten (10) business days of the end of the proceeding with the committee's decision regarding the issue.

STEP THREE: If the student is not satisfied with the outcome, they may appeal to the Academic Dean of the School of Health Sciences. This must be done in writing within five (5) days of receiving the formal letter from the grievance committee chair. The Dean will review the appeal, all evidence, and render a decision to the student within ten (10) days of receiving the formal letter from the student. The decision of the Dean of the School of Health Sciences is final and cannot be appealed.

The Disability Resource Center:

SLCC values inclusive learning environments and strives to make all aspects of the College accessible to our students. If you have a disability and believe you need accommodations to improve access to learning materials or the learning environment, please contact the Disability Resource Center:

Although pregnancy is not a disability, our DRC advisors are trained to assist with pregnancy related accommodations in addition to disability related accommodations. We strongly recommend any student who is pregnant or becomes pregnant while in the program notify the DRC. This will allow preventative measures to be taken, safety process in place to protect the student and the unborn child and allow for accommodations.

Due to risk of fetal exposure to radiation and chemicals while in the program it is strongly recommended that all pregnant students work closely with the DRC.

[redacted]

Watch the following video to learn more about the DRC: DRC Accessibility

SLCC Institutional Resources:
For information on SLCC Institutional Resources, please refer to the link on Canvas under Institutional Syllabus