SALT LAKE COMMUNITY COLLEGE
Radiologic Technology Program
Course Syllabus

Course and Credit Hours: RADS 1030, 2 credits

Name of Course: Radiographic Imaging I

Semester and Term:

Class Location 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 separate than your phone.

Link or Instructions for Accessing Online Course Materials: Grades will be on Canvas, using your MyPage login.

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

Prerequisite: Admission to program.

Course Description: Atomic structure and imaging equipment will be covered, as well as production and properties of x-rays including prime factors and radiographic quality to include density/image receptor exposure, contrast, detail and distortion.

Student Learning Outcomes:

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

1. **CHAPTER 2: RADIATION CONCEPTS**
   - Differentiate between basic structures of matter and various types of energy.
   - Explain the basic concepts of atomic theory.
   - Differentiate wave and particle theories and the radiations along the electromagnetic spectrum
   - Identify the properties of x-rays.
2. **CHAPTER 5: X-RAY TUBE**
   - Draw a complete x-ray tube including dual-focus cathode and rotating anode assembly and glass envelope.

- Explain function and design cathode assembly including the focusing cup, thermionic emission and the characteristics of filament metals and construction.
- Select exposure factors and techniques that will extend tube life and calculate safe exposures using rating charts and cooling curves.
- Discuss the characteristics of anode assembly including the line-focus principle, anode heel effect, the production of off-focus radiation.
- Describe the functions of a rotating anode induction motor, stator and rotor.
- Discuss the construction of the glass envelope and protective housing.
- Explain the line focus principle and anode heel effect

3**. CHAPTER 8: X-RAY PRODUCTION**

- State the percentage of electron energy that is converted to x-ray photon energy in the x-ray tube.
- Describe a Bremsstrahlung and Characteristic target interaction.
- Identify factors affecting characteristic K-shell photon production.
- Explain the shape of the x-ray photon emission spectrum curve.

4. **CHAPTER 12: THE PRIME FACTORS**

- Explain the relationships between milliamperage (mA), exposure time, milliamperage per second (mAs), and x-ray emission.
- State the reciprocity law and calculate mAs when given different factors.
- Explain the relationship between kilovoltage peak (kVp) and x-ray emission.
- Calculate the new kVp value needed to maintain receptor exposure when changes are made in mAs, using the 15% Rule.
- Explain the relationship between distance and x-ray emission.

5. **CHAPTER 15: BEAM RESTRICTION**

- Identify factors that affect the amount of scatter radiation produced.
- Discuss the primary methods used by radiographers to control the amount of scatter radiation reaching the image receptor (IR).
- Explain the purpose and construction of beam restricting devices.
- Compare the advantages and disadvantages of the various beam restricting devices, including image quality and patient dose.

6. **CHAPTER 17: THE PATIENT AS A BEAM EMITTER**

- Explain the process of attenuation.
- Describe the basic composition of the human body
- Describe the effect of the human body on the attenuation of the x-ray beam.
- Explain the relationship of the subject (patient) to the density, contrast, recorded detail and distortion of the recorded image.
- Differentiate between additive and destructive pathology and technique compensations

7. **CHAPTER 18: THE GRID**

- Describe the purpose of a grid and methods for evaluating the performance of a grid.
- Explain the construction of a grid including grid materials, grid ratio, grid frequency and lead content.
- Describe and differentiate between different grid patterns.
- Distinguish between stationary and a moving grid and how to select grids for specific radiographic procedures.

- Explain the relationship of grid selection to patient dose and radiographic density.
- Calculate changes in technical factors to compensate for changes in grid selection.
- Discuss common errors that are made when using a grid and the effects of these errors on the radiographic image.
- Describe other scatter reduction methods.

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
2. Communicate effectively
3. Develop quantitative literacies
4. Think critically & creatively
5. Become a community engaged learner
6. Work in professional & constructive manner
7. Develop computer & information literacy
8. Develop lifelong wellness

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. The student will inform the instructor by phone or e-mail of their absence. 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 any course will be terminated from the program.*

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 difficulty in the course, it is the student's responsibility to make arrangements to talk with the Instructor. Students are expected to be self-directed and motivated in identifying their learning needs associated with the course content.

Assignments. None.

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

Extra Credit No extra credit work will be given.

Class Procedure or Format:
This course will utilize online class discussion, PowerPoint presentations, lab exercises, group reviews, tests and quizzes.

Course Examinations:

Quizzes (5 at 5% each)	25%
Test #1, Ch. 2, Ch. 5, Ch. 8	25%
Test #2, Ch. 12	25%
Test #3, Ch.15, Ch. 17, Ch. 18	25%

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, pages, 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 before entering the classroom and may not be on the desk or person during class.
2. Wireless devices can be checked during class breaks outside the classroom.
3. If you are discovered reading/texting messages during class, you will be asked to leave the class and will be counted as absent for that class session.
4. You are expected to engage in discussion for the class. If you are discovered engaging in reading emails, 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.
5. 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]

SLCC Institutional Resources:

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

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 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 course 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 course 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