

Technical College of the Lowcountry  
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TECHNICAL COLLEGE  
OF THE LOWCOUNTRY

**RAD 201**  
**Radiation Biology**  
**Fall 2018**

**Course Description**

RAD 201 Radiation Biology  
Lec. 2 Lab. 0 Cr. 2

This course is a study of the principles of radiobiology and protection. It emphasizes procedures that keep radiation exposure to patients, personnel, and the population at large at a minimum.

Prerequisites: RAD 165, RAD 230.  
Co-requisites: RAD 115, RAD 176.  
2 Cr (2 lecture/presentation, 0 lab, 0 other)

**Course Focus**

This course is a study of the principles of radiobiology and protection. It emphasizes procedures that keep radiation exposure to patients, personnel, and the population at large at a minimum.

**Text and References**

COURSE TEXTS: Sherer, M.A., Visconti, P.J., Ritenour, E.R., (2017) Radiation Protection in Medical Radiography, (8th ed.). St. Louis: Mosby

RECOMMENDED: Bushong, S.C. (2001, 2004). Radiologic Science for Technologists (7<sup>th</sup> or 8th ed.). St. Louis: Mosby.

Technical College of the Lowcountry Radiologic Technology Student Handbook (current edition).

**Course Schedule (Hybrid Course)**

Class Location: Online or Building 4 Room 210

Course Review: Thursdays 8:00am – 10:09am (Review Every Third Thursday)

**RAD 201 Radiation Biology**  
**Developed: August 2015**  
**Revised: August 2018 ehj Approved: GMLevicki 8/2018**

**FA2018**

## Course Goals

The following list of course goals will be addressed in the course. (\*designates a CRUCIAL goal)

1. clarify effective radiation protection\*
2. define key terms and concepts\*
3. state ALARA principle\*
4. justify radiologic procedures
5. list radiation sources
6. describe photon interactions\*
7. express absorption process
8. name x-ray photon transmission types
9. discuss radiation exposure risks\*
10. calculate effective dose
11. scrutinize subvert measurement unit
12. illustrate tissue weighting factor
13. explain radiologic responsibilities
14. characterize cell structure and functions
15. identify human cell ionization consequences
16. describe target theory
17. characterize radiation energy transfer determinants
18. characterize cell radio sensitivity factors
19. diagram acute radiation syndrome response stages
20. identify radiation dose response curve drawings
21. distinguish major radiologic organizations
22. explore occupational dose limits\*
23. explore non-occupational dose limits
24. explain equivalent and effective dosing concept
25. compare CT procedure doses
26. contrast routine diagnostic procedure doses
27. wear personnel dosimeter\*
28. identify radiation survey instruments
29. employ radiographic precautions
30. validate medical management

## Student Contributions

Classes are designed to employ a variety of teaching techniques. To maximize learning, required readings and Web enhanced sections should be done prior to class. Please make sure you are following the course outline and weekly modules in Blackboard, assignments are due each week. If a student is falling behind in clinical performance and/or academic achievement, it is imperative to seek immediate assistance from the instructor.

## Course Evaluation

Quizzes (14)	30%
Homework (14)	10%
Paper (1) (Electronic Submission)	15%
Midterm (1)	20%
<u>Final Exam (1)</u>	<u>25%</u>
Total	100%

\*\*This course is a Hybrid Course with a structured online component. The student is responsible to check their emails and Blackboard assignments daily for information uploaded to the platform.

\*\*It is the student's responsibility to email the course instructor and coordinator if they have questions about course material. The student may also make an appointment for additional review.

**\*When applicable by course & Instructor: During on campus examinations, only answers transferred and completed on Scantron sheets will be graded electronically to count towards the test score.**

**\*During examinations, students must remove watches and place all belongings including electronic devices in the back of the classroom.**

This course is a hybrid course utilizing an online component. Assignments, worksheets, and course reviews will be posted to the Blackboard platform for student completion and review. If an online review is given, TCL utilizes the online test proctoring service **Honorlock**. Each student must meet the requirements for Honorlock to complete any online didactic course assignments and/or course reviews.

- Honorlock Online Proctoring and Technology Requirements  
TCL uses an online test proctoring service called Honorlock to monitor some online tests as an alternative to in-person proctoring. Your instructor may elect to have some of your tests proctored using Honorlock. If so, you will need to make sure that you have access to the necessary equipment to take your online-proctored tests:
  - A computer with access to a high-speed Internet connection
  - A webcam and microphone. A functioning webcam and microphone are required to complete proctored online tests.
  - Microsoft Office. Microsoft Office can be downloaded for free by accessing the Office 365 link in your TCL email account.

**GRADING POLICY**

Grading scale	
90% - 100% A	W withdraw
82% - 89% B	WP withdraw with passing grade
75% - 81% C	WF withdraw with failing grade
70% - 74% D	I Incomplete
Below 70% F	

**Grading Methodology.** The final grade must be 75.000 or more to pass the course successfully and progress in the program. Students absent during didactic coursework must notify the instructor via email and telephone before the absence occurs. Students absent from an examination or presentation will receive a “0” grade for the examination unless other arrangements are made with the individual instructor *prior to* the examination or presentation day. It is the responsibility of the student to contact the appropriate instructor to arrange via email to arrange an appointment to make up the examination. If the instructor is unavailable, arrangements may be completed by telephone. A message should be left on the instructor’s voice mail. It is the instructor’s discretion of time allotted for make-up examinations on an individual basis. Messages sent by other students are unacceptable and will not be involved on the student’s behalf. The student is responsible for notifying the instructor, via email, for the reason of the absence. Grades are distributed to students within one week of administration of tests and examinations. Students are encouraged to make appointments with course instructor for evaluation of individual student performance and tutoring resources.

The *student must* make an appointment with the course instructor if an examination score falls below 75%.

**ADA STATEMENT**

The Technical College of the Lowcountry provides access, equal opportunity and reasonable accommodation in its services, programs, activities, education and employment for individuals with disabilities. To request disability accommodation, contact the counselor for students with disabilities at (843) 525-8228 during the first ten business days of the academic term.

**ATTENDANCE**

The College’s statement of policy indicates that students must attend ninety percent of total class hours or they will be in violation of the attendance policy.

1. Students not physically attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.

2. Students taking an online/internet class must sign in **and** communicate with the instructor within the first ten calendar days from the start of the semester to indicate attendance in the class. Students not attending class during the first ten calendar days from the start of the semester must be dropped from the class for NOT ATTENDING.

**Attendance in an online course is defined by; at least once weekly course access and by completion of assignments as required by the instructor. Each student will be expected to access the web class at least once a week and complete weekly assignments on time. Additional access is encouraged and may be necessary for successful completion of classes.**

3. Reinstatement requires the signature of the division Dean.
  - a. In the event it becomes necessary for a student to withdraw from the course ***OR if a student stops attending class, it is the student's responsibility to initiate and complete the necessary paperwork.*** Withdrawing from class may have consequences associated with financial aid and time to completion. Students are strongly encouraged to consult with Financial Aid prior to withdrawing from any class, particularly if the student is currently on a warning or probation status.
  - b. When a student exceeds the allowed absences, the student is in violation of the attendance policy. The instructor **MUST** withdrawal the student with a grade of "W", "WP", or "WF" depending on the date the student exceeded the allowed absences and the student's progress up to the last date of attendance  
*Or*
  - c. Under extenuating circumstances and at the discretion of the faculty member teaching the class, allow the student to continue in the class and make-up the work. This exception must be documented at the time the allowed absences are exceeded.
  - d. Absences are counted from the first day of class. There are no "excused" absences. All absences are counted, regardless of the reason for the absence.
4. A student must take the final exam or be excused from the final exam in order to earn a non-withdrawal grade.
5. Students are expected to be in class *on time*. Arrival to class after the scheduled start time or leaving class prior to dismissal counts as a tardy. Three tardies and/or early departures are considered as one absence unless stated otherwise.
6. It is the student's responsibility to sign the roll/verify attendance with instructor upon entering the classroom. Failure to sign the roll/verify attendance results in a recorded absence. In the event of tardiness, it is the student's responsibility to ensure that attendance is marked. **The student is responsible** for all material/ announcements presented, whether present or absent.
7. Continuity of classroom and laboratory (which includes clinical experiences) is essential to the student's progress in providing safe and competent patient care. Students are expected to use appropriate judgment for participating in clinical activities. To evaluate

the student's knowledge and skills, it is necessary for the student to be present for all clinical experiences. If absence does occur, the Clinical Coordinator must be notified via phone message (**843-525-8261**) no later than 30 minutes prior to the student's clinical start time. The Division of Health Sciences Administrative Assistant also will be notified by telephone no later than 30 minutes prior to the start of the clinical experience. The Division of Health Sciences telephone number is (**843-525-8267**).

8. Absences from the clinical area are strongly discouraged. The attendance policy applies to clinical activities. **"NO CALL, NO SHOW"** for clinical is unprofessional conduct and **THE STUDENT WILL BE WITHDRAWN FROM THE PROGRAM.**

**\*Please refer to the Division Handbook for clarification of the No Call/No Show process.\***

**A copy of TCL's STATEMENT OF POLICY NUMBER: 3-1-307 CLASS ATTENDANCE (WITHDRAWAL) is on file in the Division Office and in the Learning Resources Center.**

## **HAZARDOUS WEATHER**

In case weather conditions are so severe that operation of the College may clearly pose a hardship on students and staff traveling to the College, notification of closing will be made through the following radio and television stations: WYKZ 98.7, WGCO 98.3, WGZO 103.1, WFXH 106.1, WWVV 106.9, WLOW 107.9, WGZR 104.9, WFXH 1130 AM, WLVA 101.1, WSOK 1230 AM, WAEV 97.3, WTOG TV, WTGS TV, WJWJ TV, and WSAV TV. Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. <https://tcl.regroup.com/signup>

## **ACADEMIC MISCONDUCT**

There is no tolerance at TCL for academic dishonesty and misconduct. The College expects all students to conduct themselves with dignity and to maintain high standards of responsible citizenship.

It is the student's responsibility to address any questions regarding what might constitute academic misconduct to the course instructor for further clarification.

The College adheres to the Student Code for the South Carolina Technical College System. Copies of the Student Code and Grievance Procedure are provided in the *TCL Student Handbook*, the Division Office, and the Learning Resources Center.

Health care professionals hold the public trust. Academic misconduct by health science student's calls that trust into question and academic integrity is expected.

It is a fundamental requirement that any work presented by students will be their own. Examples of academic misconduct include (but are not limited to):

1. Copying the work of another student or allowing another student to copy working papers, printed output, electronic files, quizzes, tests, or assignments.
2. Completing the work of another student or allowing another student to complete or contribute to working papers, printed output, electronic files, quizzes, tests, or assignments.
3. Viewing another student's computer screen during a quiz or examinations.
4. Talking or communicating with another student during a test.
5. Violating procedures prescribed by the instructor to protect the integrity of a quiz, test, or assignment.
6. Plagiarism in any form, including, but not limited to: copying/pasting from a website, textbook, previously submitted student work, or any instructor-prepared class material; obvious violation of any copyright-protected materials.
7. Knowingly aiding a person involved in academic misconduct.
8. Providing false information to staff and/or faculty.
9. Entering an office unaccompanied by faculty or staff.
10. Misuse of electronic devices.

### **Recording Devices / Cell Phones**

Students are not allowed to use recording devices during any lectures, lab, or clinical periods. Moreover, students must have cell phones **turned off** (not on vibrate) during lectures and lab times. If for any reason a cell phone rings or vibrates during lecture or lab, the student will receive a grade reduction per occurrence after the **first** warning. Students **are not allowed** to have their cell phone, iPod, or any other electronic device at their clinical rotations. Violation of the rules/requirements listed above **will be reason for dismissal from the Radiologic Sciences program.**

**During examinations, students must remove watches and place all belongings including electronic devices in the back of the classroom.**

### **SAFETY SYLLABUS**

#### **Purpose:**

The purpose of this safety addendum is to provide each student with safety guidelines during an incident, emergency, or disaster at TCL. In addition, it provides students guidelines for lockdown procedures, evacuation procedures, and active shooter.

#### **Definitions:**

**An incident** is any event, potential or actual, that may impact normal operations but has no immediate health or life-threatening consideration or serious effect on the overall functional capacity of the College. An event of this nature should be reported to the Office of the Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

**An emergency** is any incident, potential or actual, which may endanger life or health or which affects an entire building or buildings, and will disrupt the overall operations of the College. Outside emergency services will probably be required, as well as major efforts from campus support services. Major policy considerations and decisions will usually be required from the college administration during times of crises. An emergency should be reported immediately by directly using **911** if life or health/injury considerations exist and then to the Office of the President or Vice President for Administrative Services as quickly as possible. Also notify the off-site campus administrator if applicable.

**A disaster** is any event or occurrence that has taken place and has seriously impaired or halted the operations of the College. In some cases, mass personnel casualties and severe property damage may be sustained. A coordinated effort of all campus-wide resources is required to effectively control the situation. Outside emergency services will be essential. In all cases of disaster, an Emergency Control Center will be activated, and the appropriate support and operational plans will be executed. The disaster should be immediately reported, first by calling **911** and then to the Office of the President or Vice President for Administrative Services. Also notify the off-site campus administrator if applicable.

#### **Types of Emergencies:**

- Hurricane
- Tornado
- Fire
- Biochemical or Radiation Spill
- Explosion/Bomb
- Downed Aircraft (crash which directly impacts campus operations)
- Utility Failures
- Violent or criminal behavior
- Psychological Crisis

#### **Procedures**

##### **Active Shooter:**

Run—Hide—Fight Video

<http://www.fbi.gov/about-us/cirg/active-shooter-and-mass-casualty-incidents/run-hide-fight-video>

##### **Building Evacuation:**

1. Building evacuations occur when an alarm sounds and/or upon notification by Security or the Emergency Director.
2. When the building evacuation alarm is activated during an emergency, individuals should exit according to the building evacuation plan and alert others to do the same.
3. Once outside, individuals should proceed to a clear area that is at least 500 feet away from the affected building. Streets, fire lanes, hydrant areas and walkways should be kept clear for emergency vehicles and personnel.
4. Individuals should not return to an evacuated building unless told to do so by Security or the Emergency Director.



5. Individuals should assist persons with disabilities in exiting the building. Elevators are reserved for disabled persons

### **Campus Evacuation:**

1. A uniformed Security Guard, the Emergency Director, or an Emergency Resource Team member will announce evacuation of all or part of the campus grounds.
2. All persons (students and staff) are to immediately vacate the campus, or in the case of a partial evacuation relocate to another part of the campus grounds as directed.

### **Lockdown:**

1. Clear the halls
2. Report to the nearest classroom/office
3. Assist those needing special assistance
4. Ensure classroom/office doors are closed and locked
5. Turn off lights
6. Stay away from doors and windows (out of the line of sight)
7. BE QUIET and follow instructor's directions
8. Silence cell phones
9. Wait for the "All Clear" before leaving

Students, faculty and staff are highly encouraged to opt in to the Emergency Text Message Alert System. <https://tcl.reggroup.com/signup>

## **EXPECTATION OF STUDENT TO FULFILL RADIOLOGIC TECHNOLOGY COURSE REQUIREMENTS**

**Radiologic Technology students are expected to adhere to all policies outlined in the college catalog/handbook as well as the Radiologic Technology Student Handbook. Violations of any policies are unacceptable. Failure to adhere to college and radiologic technology program policies may constitute dismissal from the program.**

**Course Coordinator:** Erika H. Johnson BS R.T. (R) (ARRT)  
**Office Location:** Bldg. 4, Room 203  
**Office Phone:** 843-525-8261  
**Office Hours:** By Appointment  
**Email:** [ejohnson@tcl.edu](mailto:ejohnson@tcl.edu)

**Course Instructor:** Heather Elmquist BS R.T. (R)(M) (ARRT)  
**Email:** [helmquist@tcl.edu](mailto:helmquist@tcl.edu)



TECHNICAL COLLEGE  
OF THE LOWCOUNTRY

Technical College of the Lowcountry  
Radiologic Technology Program  
Evidence of Understanding & Course Syllabus Acknowledgement

I, \_\_\_\_\_ have been given a copy of the Fall 2018 Syllabus for **RAD 201 – Radiation Biology**. I understand that it is my responsibility to read the course syllabus in its entirety and to seek clarification if unclear. I also understand that I will be held accountable for upholding all course policies outlined within the RAD 201 Course Syllabus, Rad Tech Student Handbook, Health Sciences Division Student Handbook, and the TCL College Catalog & Student Handbook. I understand that copies of these handbooks are located on the college website link under the Radiologic Technology Program Additional Information:

<https://www.tcl.edu/programs/radiologic-technology-associate-of-applied-science/>

and <http://catalog.tcl.edu/>

By signing below, I acknowledge that the course instructor has reviewed the course syllabus with me and that I have been given an opportunity to ask questions and seek clarification. I am also attesting to the fact that I have read the course syllabus for RAD 201 and agree to be held responsible for additional policies and procedures outlined in the student handbooks.

Student Name: \_\_\_\_\_  
(Please Print)

Date: \_\_\_\_\_

Student Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Course Instructor: \_\_\_\_\_

Date: \_\_\_\_\_