



TENTATIVE—SUBJECT TO CHANGE

**RADT 1085 Radiologic Equipment
COURSE SYLLABUS
Spring Semester 202014**

COURSE INFORMATION

Credit Hours/Minutes: 3/3000

Campus/Class Location: Vidalia Campus Room 743

Class Meets: Monday 8:30 AM – 12:30 PM

Course Reference Number (CRN): 40209

INSTRUCTOR CONTACT INFORMATION

Instructor Name: Mr. Keegan Spell R.T. (R)(MR) ARRT

Email Address: Keegan Spell (kspell@southeasterntech.edu)

Campus/Office Location: Vidalia Campus Room 708

Office Hours: Monday 1:30p – 5:00p & Wednesday 8:00a – 12:00p by appointment

Phone: 912.538.3112

Fax Number: 912.538.3106

Tutoring Hours (if applicable): By Appointment Only

SOUTHEASTERN TECHNICAL COLLEGE'S (STC) CATALOG AND HANDBOOK

Students are responsible for all policies and procedures and all other information included in Southeastern Technical College's [Catalog and Handbook](http://www.southeasterntech.edu/student-affairs/catalog-handbook.php) (<http://www.southeasterntech.edu/student-affairs/catalog-handbook.php>).

REQUIRED TEXT

Radiologic Science for Technologists. 11th Edition. ISBN: 978-0323353779

REQUIRED SUPPLIES & SOFTWARE

Pen, pencil, highlighter, notebook, paper

Students should not share login credentials with others and should change passwords periodically to maintain security.

COURSE DESCRIPTION

The content of this course introduces factors that govern and influence the production of the radiographic image using analog and digital radiographic equipment found in diagnostic radiology. Emphasis will be placed on knowledge and techniques required to produce high quality diagnostic radiographic images.

MAJOR COURSE COMPETENCIES

1. Radiographic Imaging Equipment Operation
2. Equipment Quality Control, Quality Management, and Maintenance
3. Fluoroscopy (Image Intensified Conventional and Digital Fluoroscopy)
4. Mobile Radiography

PREREQUISITE(S)

Program Admittance

COURSE OUTLINE

COURSE OUTLINE

1. RADIOGRAPHIC IMAGING OPERATION

	Description	Learning Domain	Level of Learning
1.1	Identify components of the radiographic unit to include operating console, x-ray tube construction (anode, cathode, rotor/stator), automatic exposure control, and beam restriction devices.	Cognitive	Knowledge
1.2	Discuss x-ray tube construction, to include electron sources, target materials, induction motor.	Cognitive	Comprehension
1.3	Define potential difference, current (alternating and direct) and resistance.	Cognitive	Knowledge
1.4	Describe electrical protective devices such as ground and circuit breaker.	Cognitive	Knowledge
1.5	Identify the general components and functions of the tube and filament circuits.	Cognitive	Knowledge
1.6	Identify the function of solid-state rectification.	Cognitive	Knowledge
1.7	Compare generators in terms of radiation produced and efficiency.	Cognitive	Analysis
1.8	Discuss basic principles of x-ray generators, transformers (step up, step down and autotransformer), and rectification systems (phase, pulse, and frequency).	Cognitive	Comprehension
1.9	Discuss permanent installation of radiographic equipment in terms of purpose, components, types and applications.	Cognitive	Comprehension
1.10	Describe the operation and applications for different types of beam-limiting devices.	Cognitive	Knowledge
1.11	Explain the impact beam filtration has on x-ray beam intensity, beam quality and resultant patient exposure.	Cognitive	Comprehension
1.12	Describe the change in the half value layer (HVL) when filtration is added or removed in the beam.	Cognitive	Comprehension
1.13	Describe functions of components of automatic exposure control (AEC) devices.	Cognitive	Comprehension
1.14	Demonstrate proper use of AEC devices, to include radiation detectors, back-up timer and density adjustment (e.g. +1 or -1).	Cognitive	Guided Response
1.15	Identify the components of diagnostic x-ray tubes.	Cognitive	Knowledge

	Description	Learning Domain	Level of Learning
1.16	Explain protocols used to extend x-ray tube life.	Cognitive	Comprehension

2. EQUIPMENT QUALITY CONTROL, QUALITY MANAGEMENT, AND MAINTENANCE

	Description	Learning Domain	Level of Learning
2.1	Differentiate between quality improvement/management, quality assurance and quality control.	Cognitive	Analysis
2.2	List the benefits of a quality management program to the patient and to the department.	Cognitive	Knowledge
2.3	List elements of a quality management program and discuss how each is related to the quality management program.	Cognitive	Knowledge
2.4	Discuss the proper test equipment/procedures for evaluating the operation of an x-ray generator.	Cognitive	Comprehension
2.5	Evaluate the results of basic QC tests, to include mAs reciprocity, mA linearity, timer accuracy, light field to radiation field alignment, collimator accuracy, central ray alignment and monitor calibration.	Cognitive	Evaluation
2.6	Discuss quality control of digital imaging receptor systems, to include artifacts, maintenance, and display monitor quality assurance.	Cognitive	Comprehension
2.7	Discuss quality control of lead apron and glove testing.	Cognitive	Comprehension

3. FLUOROSCOPY (IMAGE INTENSIFIED CONVENTIONAL AND DIGITAL FLUOROSCOPY)

	Description	Learning Domain	Level of Learning
3.1	Explain the use of standardized radiographic technique charts.	Cognitive	Comprehension
3.2	Identify components of the fluoroscopic unit (fixed and mobile), to include image intensifier, viewing systems, automatic brightness control and magnification mode.	Cognitive	Knowledge
3.3	Explain conventional image-intensified and digital fluoroscopic image formation.	Cognitive	Comprehension
3.4	Discuss gain and conversion factors as they relate to image intensification.	Cognitive	Comprehension
3.5	Discuss automatic brightness control (ABC), image intensifier positioning, magnification mode, kerma display and last image hold.	Cognitive	Comprehension
3.6	Explain brightness gain (product of flux gain and minification gain), multiframe intensifiers, and magnification	Cognitive	Comprehension
3.7	Identify fluoroscopic recording equipment.	Cognitive	Comprehension

4. MOBILE RADIOGRAPHY

	Description	Learning Domain	Level of Learning
4.1	Discuss mobile units in terms of purpose, components, types and applications.	Cognitive	comprehension

GENERAL EDUCATION CORE COMPETENCIES

Southeastern Technical College has identified the following general education core competencies that graduates will attain:

1. The ability to utilize standard written English.
2. The ability to solve practical mathematical problems.
3. The ability to read, analyze, and interpret information.

STUDENT REQUIREMENTS

Prior to the discussion of each chapter in class, the student is expected to complete the following:

1. Read the assigned chapter.
2. Know the answers to the review questions at the end of each chapter.
3. Know the definitions of the key terms listed at the beginning of each chapter.
4. Complete all activities for assigned chapter.

Completed worksheets and any laboratory performed will be due the day of the corresponding chapter test is given. Worksheets are to assist in reviewing course materials and students are expected to perform any additional preparation for tests on their own. Cellphones should not be used during the class for any reason and students found utilizing their cellphone during the class period will automatically receive a zero on the following test.

In addition, quizzes are subject to be given on any given day over any assigned material (i.e. reading, workbooks, etc.). Any quizzes missed due to student absence will not be made up.

EXAMS: NO GRADES WILL BE DROPPED. No study guides or test reviews will be given due to time constraints on the amount of material being introduced. In addition, quizzes are subject to be given on any given day over any assigned material (i.e. reading, workbooks, etc.). Any quizzes missed due to student absence will not be made up.

Any questions regarding a test will need to be submitted by email to the instructor and/or an appointment can be arranged to discuss any questions during the instructor's office hours. No class time will be spent debating test questions.

ATTENDANCE GUIDELINES

It is essential that educational programs meet requirements and standards necessary for successful employment in business and industry. In view of the intensive nature of educational programs, it is necessary for every student to be present and on time every day for all classes as is required in the work environment.

Class attendance is a very important aspect of a student's success. Being absent from class prevents students from receiving the full benefit of a course and also interrupts the learning process. Southeastern Technical College considers both tardiness and leaving early as types of absenteeism. Responsibility for class attendance rests with the student. Regular and punctual attendance at all scheduled classes is required for student success. Students will be expected to complete all work required by the instructor as described in the individual course syllabus.

Instructors have the right to give unannounced quizzes/assignments. Students who miss an unannounced quiz or assignment will receive a grade of 0. Students who stop attending class, but do not formally withdraw, may receive a grade of F and face financial aid repercussions in upcoming semesters.

Instructors are responsible for determining whether missed work may be made up and the content and dates for makeup work is at the discretion of the instructor.

Students will not be withdrawn by an instructor for attendance; however, all instructors will keep records of graded assignments and student participation in course activities. The completion dates of these activities will be used to determine a student's last date of attendance in the event a student withdraws, stops attending, or receives an F in a course.

ADDITIONAL PROVISIONS

Health Sciences

Requirements for instructional hours within Health Science programs reflect the rules of respective licensure boards and/or accrediting agencies. Therefore, these programs have stringent attendance policies. Each program's attendance policy is published in the program's handbook and/or syllabus which specify the number of allowable absences. All provisions for required make-up work in the classroom or clinical experiences are at the discretion of the instructor.

PROGRAM SPECIFIC ATTENDANCE REQUIREMENTS

In accordance with the general procedure of the school, it is the desire for each student to successfully complete each course in the program. This is necessary to meet graduation requirements. **Regular attendance, punctuality, and responsibility** for class work are three of the most significant factors for success in college. Students are expected to be present, punctual and prepared for every class assignment, and they are expected to seek additional help from the instructors when needed.

Any student who is not present at the beginning of class/lab instruction may not be allowed to enter the classroom until a scheduled break.

Attendance procedures are documented on each course syllabus. Students are responsible to monitor their own record of absences and late arrivals, and should refer to individual course syllabi for specific requirements.

The faculty may consider extenuating circumstances related to absences on a case by case basis.

Extenuating Circumstances are unforeseen accidents, illness/deaths in the immediate family or personal illness which requires you to be absent from class or clinical. Vacations, weddings, non-emergent doctor appointments, studying for an exam, child care issues, job interviews and working at your job, etc., are not considered extenuating circumstances as these are not unforeseen events. Students wishing to claim extenuating circumstances may be asked to provide documentation of the condition which led to absenteeism. The presence of extenuating circumstances does not guarantee that a student will be exempted from attendance procedures.

In this course, which meets 1 day a week for 15 weeks, the maximum number of days a student may miss are 2 days during the semester.

STUDENTS WITH DISABILITIES

Students with disabilities who believe that they may need accommodations in this class based on the impact of a disability are encouraged to contact the appropriate campus coordinator to request services.

Swainsboro Campus: [Macy Gay \(mgay@southeasterntech.edu\)](mailto:mgay@southeasterntech.edu), 478-289-2274, Building 1, Room 1210.

Vidalia Campus: [Helen Thomas \(hthomas@southeasterntech.edu\)](mailto:hthomas@southeasterntech.edu), 912-538-3126, Building A, Room 165.

SPECIFIC ABSENCES

Provisions for Instructional Time missed because of documented absences due to jury duty, military duty, court duty, or required job training will be made at the discretion of the instructor.

MAKEUP POLICY

Students will be allowed to makeup one test. Any further missed tests will result in a grade of zero. All makeup exams will be given at the discretion of the instructor and accommodations may be made based upon extenuating circumstances.

***Extenuating circumstances are unforeseen accidents, deaths in the immediate family or personal illness which requires you to be absent from class or clinical. Vacations, weddings, doctor appointments, studying for an exam, child care issues, job interviews and working at your job are not considered extenuating circumstances as these are not unforeseen events. ***

PREGNANCY

Southeastern Technical College does not discriminate on the basis of pregnancy. However, we can offer accommodations to students who are pregnant that need special consideration to successfully complete the course. If you think you will need accommodations due to pregnancy, please make arrangements with the appropriate campus coordinator.

Swainsboro Campus: [Macy Gay \(mgay@southeasterntech.edu\)](mailto:mgay@southeasterntech.edu), 478-289-2274, Building 1, Room 1210.

Vidalia Campus: [Helen Thomas \(hthomas@southeasterntech.edu\)](mailto:hthomas@southeasterntech.edu), 912-538-3126, Building A, Room 165.

It is strongly encouraged that requests for consideration be made **PRIOR** to delivery and early enough in the pregnancy to ensure that all the required documentation is secured before the absence occurs. Requests made after delivery MAY NOT be accommodated. The coordinator will contact your instructor to discuss accommodations when all required documentation has been received. The instructor will then discuss a plan with you to make up missed assignments.

WITHDRAWAL PROCEDURE

Students wishing to officially withdraw from a course(s) or all courses after the drop/add period and prior to the 65% portion of the semester (date will be posted on the school calendar) must speak with a Career Counselor in Student Affairs and complete a Student Withdrawal Form. A grade of "W" is assigned when the student completes the withdrawal form from the course.

Students who are dropped from courses due to attendance (see your course syllabus for attendance policy) after drop/add until the 65% point of the semester will receive a "W" for the course. Abandoning a course(s) instead of following official withdrawal procedures may result in a grade of 'F' being assigned.

After the 65% portion of the semester, the student will receive a grade for the course. (Please note: A zero will be given for all missed assignments.)

There is no refund for partial reduction of hours. Withdrawals may affect students' eligibility for financial aid

for the current semester and in the future, so a student must also speak with a representative of the Financial Aid Office to determine any financial penalties that may be assessed due to the withdrawal. All grades, including grades of 'W', will count in attempted hour calculations for the purpose of Financial Aid.

Remember - Informing your instructor that you will not return to his/her course does not satisfy the approved withdrawal procedure outlined above.

In this course, which meets 1 days a week for 15 weeks, the maximum number of days a student may miss are 2 days during the semester.

CELL PHONE POLICY

Cell phones are not permitted in the classroom or laboratory. Any student caught with a cell phone in the classroom or laboratory in any capacity (texting, talking on or, emailing), whether the phone is on or off, will have 10 points taken off their next chapter (section) exam grade. In the event of an emergency, such as a sick family member or sick child, their calls should be directed to the front desk at 912-538-3117 where a message can be left.

ACADEMIC DISHONESTY POLICY

The Southeastern Technical College Academic Dishonesty Policy states that all forms of academic dishonesty, including but not limited to cheating on tests, plagiarism, collusion, and falsification of information, will call for discipline. The policy can also be found in the Southeastern Technical College Catalog and Handbook.

PROCEDURE FOR ACADEMIC MISCONDUCT

The procedure for dealing with academic misconduct and dishonesty is as follows:

1. First Offense

Student will be assigned a grade of "0" for the test or assignment. Instructor keeps a record in course/program files and notes as first offense. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus. The Registrar will input the incident into Banner for tracking purposes.

2. Second Offense

Student is given a grade of "WF" (Withdrawn Failing) for the course in which offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of second offense. The Registrar will input the incident into Banner for tracking purposes.

3. Third Offense

Student is given a grade of "WF" for the course in which the offense occurs. The instructor will notify the student's program advisor, academic dean, and the Registrar at the student's home campus indicating a "WF" has been issued as a result of third offense. The Vice President for Student Affairs, or designee, will notify the student of suspension from college for a specified period of time. The Registrar will input the incident into Banner for tracking purposes.

STATEMENT OF NON-DISCRIMINATION

The Technical College System of Georgia (TCSG) and its constituent Technical Colleges do not discriminate on the basis of race, color, creed, national or ethnic origin, gender, religion, disability, age, political affiliation or belief, genetic information, disabled veteran, veteran of the Vietnam Era, spouse of military member, or citizenship status (except in those special circumstances permitted or mandated by law). This nondiscrimination policy encompasses the operation of all technical college-administered programs, federally financed programs, educational programs and activities involving admissions, scholarships and loans, student

life, and athletics. It also applies to the recruitment and employment of personnel and contracting for goods and services.

All work and campus environments shall be free from unlawful forms of discrimination, harassment and retaliation as outlined under Title IX of the Educational Amendments of 1972, Title VI and Title VII of the Civil Rights Act of 1964, as amended, the Age Discrimination in Employment Act of 1967, as amended, Executive Order 11246, as amended, the Vietnam Era Veterans Readjustment Act of 1974, as amended, Section 504 of the Rehabilitation Act of 1973, as amended, the Americans With Disabilities Act of 1990, as amended, the Equal Pay Act, Lilly Ledbetter Fair Pay Act of 2009, the Georgia Fair Employment Act of 1978, as amended, the Immigration Reform and Control Act of 1986, the Genetic Information Nondiscrimination Act of 2008, the Workforce Investment Act of 1998 and other related mandates under TCSG Policy, federal or state statutes.

The Technical College System and Technical Colleges shall promote the realization of equal opportunity through a positive continuing program of specific practices designed to ensure the full realization of equal opportunity.

The following individuals have been designated to handle inquiries regarding the nondiscrimination policies:

<p>American With Disabilities Act (ADA)/Section 504 - Equity- Title IX (Students) – Office of Civil Rights (OCR) Compliance Officer</p>	<p>Title VI - Title IX (Employees) – Equal Employment Opportunity Commission (EEOC) Officer</p>
<p>Helen Thomas, Special Needs Specialist Vidalia Campus 3001 East 1st Street, Vidalia Office 165 Phone: 912-538-3126 Email: Helen Thomas hthomas@southeasterntech.edu</p>	<p>Lanie Jonas, Director of Human Resources Vidalia Campus 3001 East 1st Street, Vidalia Office 138B Phone: 912-538-3230 Email: Lanie Jonas ljonas@southeasterntech.edu</p>

ACCESSIBILITY STATEMENT

Southeastern Technical College is committed to making course content accessible to individuals to comply with the requirements of Section 508 of the Rehabilitation Act of Americans with Disabilities Act (ADA). If you find a problem that prevents access, please contact the course instructor.

GRIEVANCE PROCEDURES

Grievance procedures can be found in the Catalog and Handbook located on Southeastern Technical College’s website.

ACCESS TO TECHNOLOGY

Students can now access Blackboard, Remote Lab Access, Student Email, Library Databases (Galileo), and BannerWeb via the mySTC portal or by clicking the Current Students link on the [Southeastern Technical College \(STC\) Website \(www.southeasterntech.edu\)](http://www.southeasterntech.edu).

TECHNICAL COLLEGE SYSTEM OF GEORGIA (TCSG) GUARANTEE/WARRANTY STATEMENT

The Technical College System of Georgia guarantees employers that graduates of State Technical Colleges shall possess skills and knowledge as prescribed by State Curriculum Standards. Should any graduate employee within two years of graduation be deemed lacking in said skills, that student shall be retrained in any State Technical College at no charge for instructional costs to either the student or the employer.

GRADING POLICY

Assessment/Assignment	Percentage
Chapter Tests	35%
Worksheets	20%
Laboratory	20%
Final Exam	25%

GRADING SCALE

Letter Grade	Range
A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

Course Number and Name

Spring Semester 2020 Lesson Plan

Date/Week	Chapter/Lesson	Content	Assignments & Tests Due Dates	Competency Area
Week 1 1/13/20	Chapter 3 & 4	Review Syllabus, Classroom Procedures, etc. <u>Lecture (Chapter 3)</u> – Electromagnetic Energy <u>Lecture (Chapter 4)</u> – Electricity, Magnetism, and Electromagnetism	-Read Chapters 3 & 4 -Complete Worksheets -Study for Test	
1/20/20	MLK Holiday			
Week 2 1/27/20	Chapter 5 & Mobile Radiography	Test (Chapter 3 & 4) <u>Lecture (Chapter 5)</u> – The X-Ray Imaging System <u>Lecture (Chapter 15 from Bontrager and Handout)</u> – Mobile Radiography	-Read Chapters 5, 15, and Handout -Complete Worksheets -Study for Test	
Week 3 2/3/20	Chapter 6	Test (Chapter 5 & 15) <u>Lecture (Chapter 6)</u> – The X-Ray Tube	-Read Chapter 6 -Complete Worksheets -Study for Test	
Week 4 2/10/20	Chapter 7	Test (Chapter 6) <u>Lecture (Chapter 7)</u> – X-Ray Production	-Read Chapter 7 -Complete Worksheets -Study for Test	
Week 5 2/17/20	Chapter 8	Test (Chapter 7) <u>Lecture (Chapter 8)</u> – X-Ray Emission	-Read Chapter 8 -Complete Worksheets -Study for Test	
Week 6 2/24/20	Chapter 9	Test (Chapter 8) <u>Lecture (Chapter 9)</u> – X-Ray Interaction with Matter	-Read Chapter 9 -Complete Worksheets -Study for Test	
Week 7 3/2/20	Chapter 11	Test (Chapter 9) <u>Lecture (Chapter 11)</u> – Scatter Radiation	-Read Chapter 11 -Complete Worksheets -Study for Test	
Week 8 3/9/20	Chapter 14	Test (Chapter 11) <u>Lecture (Chapter 14)</u> – Medical Imaging Computer Science	-Read Chapter 14 -Complete Worksheets -Study for Test	
Week 9 3/16/20	Chapter 15	Test (Chapter 14) <u>Lecture (Chapter 15)</u> – Computed Radiography	-Read Chapter 15 -Complete Worksheets -Study for Test	

Date/Week	Chapter/Lesson	Content	Assignments & Tests Due Dates	Competency Area
Week 10 3/23/20	Chapter 16 & 17	Test (Chapter 15) <u>Lecture (Chapter 16)</u> – Digital Radiography <u>Lecture (Chapter 17)</u> – Digital Radiographic Technique	-Read Chapters 16 & 17 -Complete Worksheets -Study for Test	
Week 11 3/30/20	Chapter 18 & 21	Test (Chapter 16 & 17) <u>Lecture (Chapter 18)</u> – Viewing the Digital Image <u>Lecture (Chapter 21)</u> – Digital Radiographic Artifacts	-Read Chapters 18 & 21 -Complete Worksheets -Study for Test	
4/6/20	Spring Break			
Week 12 4/13/20	Chapter 22 & 25	Test (Chapter 18 & 21) <u>Lecture (Chapter 22)</u> – Digital Radiographic Quality Control <u>Lecture (Chapter 25)</u> – Fluoroscopy	-Read Chapters 22 & 25 -Complete Worksheets -Study for Test	
Week 13 4/20/20	Chapter 26	Test (Chapter 22 & 25) <u>Lecture (Chapter 26)</u> – Digital Fluoroscopy	-Read Chapters 26 -Complete Worksheets -Study for Test	
Week 14 4/27/20	Review	Test (Chapter 26) Final Exam Review	-Study for Finals	
Week 15 5/4/20	Final Exam	Final Exam		

COMPETENCY AREAS: (WILL VARY FOR EACH COURSE/TAKEN FROM STATE STANDARDS)

1. Radiographic Imaging Equipment Operations
2. Equipment Quality control, Quality Management, and Maintenance
3. Fluoroscopy (Image Intensified Conventional and Digital Fluoroscopy)
4. Mobile Radiography

GENERAL CORE EDUCATIONAL COMPETENCIES:

- a) The ability to utilize standard written English.
- b) The ability to solve practical mathematical problems.
- c) The ability to read, analyze, and interpret information.