

*South Plains College -Reese Campus*  
**Course Syllabus**

**COURSE: RADR 2235.200 (3:0:0), Radiologic Technology Seminar (Capstone)**

**SEMESTER: Summer 2015**

**CLASS TIMES: T/TR, 09:30 – 12:30**

**INSTRUCTOR: Stacy Randel, MSRS**

**OFFICE: RC 512B**

**OFFICE HOURS: MTWR: 01:00 – 03:00; By appointment**

**OFFICE PHONE: 806-716-4628**

**E-MAIL: [srandel@southplainscollege.edu](mailto:srandel@southplainscollege.edu)**

**Facebook:** The radiologic technology program has a Facebook page at [www.facebook.com/spcradiologictechnologyprogram](http://www.facebook.com/spcradiologictechnologyprogram). In addition to the South Plains college websites, this Facebook page will be used to keep students up-to-date on program activities, weather delays, South Plains college announcements and will help with program recruitment. "Liking" the radiologic technology program's Facebook page is not mandatory, nor is a personal Facebook accounts in order to access this page.

**BlackBoard:** Blackboard is an e-education platform designed to enable educational innovations everywhere by connecting people and technology. This education tool will be used in this course throughout the semester.

*"South Plains College improves each student's life."*

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**GENERAL COURSE INFORMATION**

**COURSE DESCRIPTION**

This is a capstone course that focuses on the synthesis of professional knowledge, skills and attitudes in preparation for professional employment and lifelong learning.

**STUDENT LEARNING OUTCOMES**

**The student will:**

1. Synthesize professional knowledge, skills and attitudes.
2. Make entry-level, professional decisions regarding radiographic procedures to ensure diagnostic images, taking into consideration any constraints and generating possible alternatives the routine.
3. Validate the necessity of lifelong learning to acquire new technology and maintain professional skills.

**COURSE OBJECTIVES**

The student will:

1. Evaluate the Program content areas to identify areas of strength and weakness. (C5)
2. Review all Program content areas, using study guides outlining the minimum amount of knowledge required in each area.
3. Receive individual review in those areas of major weakness, if necessary.
4. Answer detailed questions from the following subject areas (C5-7):

Ethics  
Medical Terminology

Contrast Media  
Radiology Physics

Conventional Film-Screen & Digital Radiography  
Radiographic Anatomy & Physiology  
Patient Care Pertinent to Radiology  
Radiographic Positioning  
Radiographic Darkroom Technology  
Radiographic Quality

Radiographic Equipment & QA  
Radiation Biology & Protection  
Radiographic Special Procedures  
Advanced Imaging Modalities  
Medical & Surgical Diseases  
Pharmacology

## **CAPSTONE EXPERIENCE - VERIFICATION OF WORKPLACE COMPETENCIES**

RADR 2235 is identified as a Capstone Experience. The learning experience is a consolidation of the student's educational experience; and certifies mastery of entry-level radiography competencies.

## **EVALUATION METHOD**

The RADR 2235 Radiologic Technology Seminar students will be assessed using **five** comprehensive, discipline specific examinations.. The exam schedule is located on Blackboard.

The following guidelines will be followed regarding exams:

- The student is expected to complete a major exam at the scheduled time. **Make-up exams will only be given with the approval of the instructor.** A student will not be allowed to take the next exam until the previous exam has been completed with corrections
- A student arriving late for a major exam will not be allowed to take the exam if any student has completed the exam and left the classroom.
- All major exams must be completed within the designated class time.
- **Cell phones cannot be used as calculators during class.** No exceptions.
- It is the responsibility of the student to bring an appropriate calculator to class.
- Major exams will be returned to the student to be corrected in class. **Half-credit will be awarded for each successful correction and added to the original grade.**
- **Exams will be returned for review.**

## **ACADEMIC INTEGRITY**

It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own any work which he or she has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension.

**Cheating** - Dishonesty of any kind on examinations or on written assignments, illegal possession of examinations, the use of unauthorized notes during an examination, obtaining information during an examination from the textbook or from the examination paper of another student, assisting others to cheat, alteration of grade records, illegal entry or unauthorized presence in the office are examples of cheating. Complete honesty is required of the student in the presentation of any and all phases of coursework. This applies to quizzes of whatever length, as well as final examinations, to daily reports and to term papers.

**Plagiarism** - Offering the work of another as one's own, without proper acknowledgment, is plagiarism; therefore, any student who fails to give credit for quotations or essentially identical expression of material taken from books, encyclopedias, magazines and other reference works, or from themes, reports or other writings of a fellow student, is guilty of plagiarism.

## **SCANS and FOUNDATION SKILLS**

Scans and foundation skills are identified for specific course objectives. A complete list explaining these skills is attached to the back of the syllabus for your information.

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## SPECIFIC COURSE INFORMATION

### TEXT AND MATERIALS

Bushong, Stewart C. **Radiologic Science for Technologists**. 9<sup>th</sup> Edition. 2008. Elsevier/Mosby.  
Callaway, William J. **Mosby’s Comprehensive Review of Radiography**. 6<sup>th</sup> Edition. 2012. Mosby/Elsevier (Optional)

### ATTENDANCE POLICY

Class attendance is mandatory. Policies regarding absences coincide with those established for South Plains College as outlined in the [SPC General Catalog](#).

It is extremely important that students arrive for class **on time**. **Tardiness** disrupts the instructor and the other students. Students who chronically arrive late will be counseled and if necessary, dropped from the class regardless of their grade point average. The student should be prepared for class at the scheduled class start time. **Students with perfect attendance will be awarded 2 points to their final grade at the end of the semester.**

### CLASS PREPARATION POLICY

Preparation for this class is the responsibility of the student. Time will not permit extensive lectures over material that has already been covered in previous classes; therefore, the student is responsible for reviewing the material. The instructor will be available during class for questions and assistance in preparation for each test.

Information review and assessment is divided into 5 units:

1. Radiation Protection
2. Equipment Operation and Quality Control
3. Imaging Acquisition and Evaluation
4. Imaging Procedures
5. Patient Care and Educations

### GRADING POLICY

**A grade average of C (75) must be maintained in all RAD TECH classes.** Failure to do so will result in the student being dropped from the Program. The following grading policy will be used in determining the final course grade:

5 Major Exams	75%	A	91 – 100
BlackBoard Participation	25%	B	83 – 90
Total	100%	C	75 – 82
		F	0 - 74

### COMMUNICATION POLICY

Electronic communication between instructor and students in this course will utilize the South Plains College “My SPC” and email systems. Instructor will not initiate communication using private email accounts. Students are encouraged to check SPC email on a regular basis.

## STUDENT CONDUCT

Students in this class are expected to abide by the standards of student conduct as defined in the SPC Student Guide.

## CELL PHONES

**Cell Phones** – Cell phones are to be turned OFF during scheduled class periods, unless prior approval has been given from the instructor. This includes text messaging. Cell phones are to be used outside the classroom only.

## FACEBOOK

The Radiologic Technology Program has a Facebook page at [www.facebook.com/spradiologictechnologyprogram](http://www.facebook.com/spradiologictechnologyprogram) . This Facebook page will be used to keep students up-to-date on program activities, weather delays, South Plains College announcements and will help with program recruitment. “Liking” the Radiologic Technology Facebook page is not mandatory.

## BLACKBOARD

Blackboard is an e-education platform designed to enable educational innovations everywhere by connecting people and technology. This education tool will be used in this course throughout the semester.

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## ACCOMMODATIONS

### DIVERSITY STATEMENT

In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

### DISABILITIES STATEMENT

#### ADA Statement

Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office through the Guidance and Counseling Centers at Reese Center (Building 8) [716-4606](tel:716-4606), or Levelland (Student Services Building) [716-2577](tel:716-2577).

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## COURSE OUTLINE

### RADIATION PROTECTION

#### Radiation Biology and Protection

With at least 75% accuracy, the student will:

1. Define all terms and units of measure related to radiation biology & protection, including but not limited to:

Roentgen	Dose equivalent formula
Rem	Ionization
Rad	Inverse square law
Curie	Half-value layer
Roentgen/kilogram	Alpha particle
Gray	Beta particle
Seivert	Positron particle
Becquerel	X-radiation
Dose equivalent	Gamma radiation

- Identify the possible long-term effects of radiation exposure.
- Identify the possible somatic effects of radiation exposure.
- Identify the possible genetic effects of radiation exposure.
- Identify relative tissue, organ and cell radiosensitivities.
- Identify relative dose-effect relationships.
- Complete the mathematical calculations related to radiation protection. (F3)
- Identify and explain the required and recommended methods of radiation protection, including time, distance and shielding.
- Identify the recommended dose equivalent limits established for diagnostic radiography.
- Identify the characteristics of the basic devices used for detecting and/or measuring radiation exposure.
- Identify the characteristics of the basic devices used for personnel dosimetry in radiography.

## **RADIOGRAPHIC EQUIPMENT**

### **Radiographic Equipment, Maintenance & QA**

With at least 75% accuracy, the student will:

- Explain electrostatics, electrodynamics, magnetism and electromagnetism.
- Identify series and parallel circuits. (F10)
- Calculate voltage, resistance and/or current for a given circuit. (F3,10,12)
- Identify the components of a basic single-phase x-ray circuit and describe their function. (F10)
- Differentiate between single-phase; three-phase, six-pulse; three-phase, twelve-pulse and high frequency x-ray circuits.
- Identify the components of a conventional and a digital/computed radiographic unit and describe their function. (F10)
- Identify the components of a conventional and a digital fluorographic unit and describe their function. (F10)
- Identify the Quality Assurance procedures and acceptable parameters for radiographic and fluorographic systems.

## **IMAGE ACQUISITION AND EVALUATION**

### **Radiographic Imaging and Technical Factors**

With at least 75% accuracy, the student will:

1. Explain x-ray production. (F10)
2. Identify the factors that affect x-ray production.
3. Identify and describe the five x-ray/matter interactions. (F10)
4. Explain the importance of Compton and photoelectric interactions to image production. (F12)
5. Identify the factors affecting the probability of Compton and photoelectric interactions.
6. Identify the primary technical factors of radiographic exposure and discuss their function. (F12)
7. Identify the secondary technical factors of radiographic exposure and discuss their function. (F12)
8. Describe the conditions influencing exposure factor selection. (F12)
9. Identify and describe how to use filters, beam restricting devices and grids in radiographic imaging. (F12)
10. Identify and describe the indirect method of acquiring a computed radiographic image. (F12)
11. Identify and describe the direct and indirect methods of acquiring a digital radiographic image. (F12)
12. Identify and describe the function of each component found in the automatic processing solutions. (F12)
13. Identify the systems of an automatic processor.
14. Identify the preprocessing functions of digital imaging. (F8)
15. Identify the postprocessing options of digital imaging. (F8)
16. Identify the characteristics of a diagnostic quality radiographic film image.
17. Identify the characteristics of a diagnostic quality radiographic digital image.
18. Describe the structure and components of radiographic film.
19. Identify the proper way of storing and handling radiographic film. (F8)
20. Describe the structure and components of radiographic intensifying screens.
21. Identify common radiographic artifacts and their cause.

## **IMAGING PROCEDURES**

### **Radiographic Anatomy and Physiology**

With at least 75% accuracy, the student will:

1. List all of the body systems.
2. Identify the pertinent organs and explain their function of each body system.
3. Identify and explain the function of human cellular components.

### **Radiographic Positioning and Procedures**

With at least 75% accuracy, the student will:

1. List and describe the routine and special projections of the following anatomical structures:

Shoulder girdle and upper extremity  
Pelvic girdle and lower extremity  
Bony thorax  
Vertebral column  
Respiratory system

Digestive system  
Urinary system  
Skull and facial bones  
Sinuses and mastoids

2. Assess the routine and special projections of the following anatomical structures using established evaluation criteria:

Shoulder girdle and upper extremity  
Pelvic girdle and lower extremity  
Bony thorax  
Vertebral column  
Respiratory system

Digestive system  
Urinary system  
Skull and facial bones  
Sinuses and mastoids

3. Identify the structures demonstrated in the routine and special projections of the following anatomical structures:

Shoulder girdle and upper extremity  
Pelvic girdle and lower extremity  
Bony thorax  
Vertebral column  
Respiratory system

Digestive system  
Urinary system  
Skull and facial bones  
Sinuses and mastoids

### **Special Procedures and Advanced Imaging Modalities**

With at least 75% accuracy, the student will:

1. Identify and describe features of the equipment pertinent to special procedures. (C15)
2. Describe the basic guidelines for contrast media usage.
3. Identify the basic contrast media used in:

Arteriography  
Venography  
Pneumography  
Myelography

GI radiography  
Urinary radiography  
Reproductive system radiography  
Arthrography

4. Explain the specialized radiographic procedures for:

Body section radiography  
Image intensification  
Foreign body localization  
Cineradiography

Ultrasound  
Computed tomography  
Magnetic resonance imaging  
Nuclear medicine

## **PATIENT CARE AND EDUCATION**

### **Medical Terminology**

With at least 75% accuracy, the student will:

1. Define the terms associated with radiologic technology and other medical imaging modalities.
2. Define the most common prefixes used in the medical field.
3. Define the most common root words used in the medical field.
4. Define the most common suffixes used in the medical field.

### **Patient Care, Pharmacology and Ethics**

With at least 75% accuracy, the student will:

1. Explain the importance of ethical behavior in the allied health professions. (F8,13,17)
2. Identify acceptable ethical behavior in the allied health professions. (F8,13,17)
3. Identify the ethical and medical legal issues associated with the allied health professions. (F8,13,17)
4. Evaluate the patient's condition upon entering the radiology department. (F8-10)
5. Identify the symptoms of common emergencies encountered in a radiology department.
6. Identify the drugs and their applications that are common to radiographic procedures and emergencies commonly encountered in a radiology department.
7. Identify the biological factors that affect drug actions. (F12)
8. Identify the methods of drug administration.
9. Describe the venipuncture procedure.
10. Identify the symptoms of an adverse contrast media reaction.
11. Explain safe methods of transporting and moving patients.
12. Explain medical and surgical asepsis.

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## **FOUNDATION SKILLS**

### **BASIC SKILLS—Reads, Writes, Performs Arithmetic and Mathematical Operations, Listens and Speaks**

F-1 Reading—locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.

F-2 Writing—communicates thoughts, ideas, information and messages in writing and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.

F-3 Arithmetic—performs basic computations; uses basic numerical concepts such as whole numbers, etc.

F-4 Mathematics—approaches practical problems by choosing appropriately from a variety of mathematical techniques.

F-5 Listening—receives, attends to, interprets, and responds to verbal messages and other cues.

F-6 Speaking—organizes ideas and communicates orally.

### **THINKING SKILLS—Thinks Creatively, Makes Decisions, Solves Problems, Visualizes and Knows How to Learn and Reason**

F-7 Creative Thinking—generates new ideas.

F-8 Decision-Making—specifies goals and constraints, generates alternatives, considers risks, evaluates and chooses best alternative.

F-9 Problem Solving—recognizes problems, devises and implements plan of action.



- F-10 Seeing Things in the Mind’s Eye—organizes and processes symbols, pictures, graphs, objects, and other information.
- F-11 Knowing How to Learn—uses efficient learning techniques to acquire and apply new knowledge and skills.
- F-12 Reasoning—discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

**PERSONAL QUALITIES—Displays Responsibility, Self-Esteem, Sociability, Self-Management, Integrity and Honesty**

- F-13 Responsibility—exerts a high level of effort and perseveres towards goal attainment.
- F-14 Self-Esteem—believes in own self-worth and maintains a positive view of self.
- F-15 Sociability—demonstrates understanding, friendliness, adaptability, empathy and politeness in group settings.
- F-16 Self-Management—assesses self accurately, sets personal goals, monitors progress and exhibits self-control.
- F-17 Integrity/Honesty—chooses ethical courses of action.

**SCANS COMPETENCIES**

- C-1 **TIME** - Selects goal - relevant activities, ranks them, allocates time, prepares and follows schedules.
- C-2 **MONEY** - Uses or prepares budgets, makes forecasts, keeps records and makes adjustments to meet objectives.
- C-3 **MATERIALS AND FACILITIES** - Acquires, stores, allocates, and uses materials or space efficiently.
- C-4 **HUMAN RESOURCES** - Assesses skills and distributes work accordingly, evaluates performances and provides feedback.

**INFORMATION - Acquires and Uses Information**

- C-5 Acquires and evaluates information.
- C-6 Organizes and maintains information.
- C-7 Interprets and communicates information.
- C-8 Uses computers to process information.

**INTERPERSONAL—Works With Others**

- C-9 Participates as a member of a team and contributes to group effort.
- C-10 Teaches others new skills.
- C-11 Serves Clients/Customers—works to satisfy customer’s expectations.
- C-12 Exercises Leadership—communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
- C-13 Negotiates—works toward agreements involving exchanges of resources; resolves divergent interests.
- C-14 Works With Diversity—works well with men and women from diverse backgrounds.

**SYSTEMS—Understands Complex Interrelationships**

- C-15 Understands Systems—knows how social, organizational, and technological systems work and operates effectively with them.
- C-16 Monitors and Corrects Performance—distinguishes trends, predicts impacts on system operations, diagnoses systems performance and corrects malfunctions.
- C-17 Improves or Designs Systems—suggests modifications to existing systems and develops new or alternative systems to improve performance.

**TECHNOLOGY—Works with a Variety of Technologies**

- C-18 Selects Technology—chooses procedures, tools, or equipment, including computers and related technologies.

C-19 Applies Technology to Task—understands overall intent and proper procedures for setup and operation of equipment.

C-20 Maintains and Troubleshoots Equipment—prevents, identifies, or solves problems with equipment, including computers and other technologies.

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