COURSE SYLLABUS

Department: Radiologic Technology

Course Title: Radiation Biology and Protection

Section Name: RADR 2313

Start Date: 01/18/2011

End Date: 05/14/2011

Modality: FACE-TO-FACE

Credits: 3

Instuctor Information

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Course Description

Effects of radiation exposure on biological systems. Includes typical medical exposure levels, methods for measuring and monitoring radiation, and methods for protecting personnel and patients from excessive exposure.

Prerequisites/Corequisites

Prerequisite: RADR 2333. Corequisites: RADR 1191 and RADR 2267

SCANS

1, 2, 3, 6, 7, 9, 11

Course Objectives

The student will describe the production of x-radiation, the biophysical mechanisms of radiation damage and the somatic and genetic effects of radiation exposure on humans; state typical dose ranges for routine radiographic procedures; explain basic methods and instruments for radiation monitoring, detection and measurement; and apply appropriate radiation protection practices.

COMPUTER PROGRAMS AVAILABLE IN CT 216 (COMPUTER LAB)

Challenge, Radiographic Physics, Corectec, 2009
Radiographic Imaging, Mosby, 1998 MCD
Radiographic Quality, Radiographic Density, Radiographic Contrast, Radiographic Recorded Detail and Distortion, Challenge, Equipment, Patient Care, Anatomy and Positioning, Radiation Biology and Protection, and Radiographic Imaging, Corectec, 2009 MCD

COURSE COMPETENCIES

1XRA.36.00 DESCRIBE /DISCUSS THE CHEMICAL COMPOSITION OF THE BODY

1XRA.36.03 Discuss the pH scale and differentiate between acid and base substances.
1XRA.36.05 Describe the different types of carbohydrates and give examples of each type.
1XRA.36.06 Describe the different types of lipids and their common characteristics.
1XRA.36.07 Explain the structure and functions of proteins.
1XRA.36.08 Describe the structure of DNA and the law of complementary base pairing.
1XRA.36.09 Describe the structure of RNA and name the different types of RNA.

1XRA.37.00 KNOW CELL STRUCTURE AND EXPLAIN GENETIC CONTROL

1XRA.37.01 Explain the structure of the cell membrane and the cytoskeleton.
1XRA.37.02 Define endocytosis and exocytosis.
1XRA.37.04 Explain the replication of DNA.
1XRA.37.05 Describe the phase of the cell cycle.
1XRA.37.06 Describe genetic transcription and the post-transcriptional modifications that charge pre-mRNA into mRNA.
1XRA.37.07 Describe the functions of mRNA, tRNA, and rRNA.
1XRA.37.08 Explain the mechanisms of genetic translation of the RNA code into the synthesis of proteins.
1XRA.37.09 Describe the functions of the rough endoplasmic reticulum and Golgi apparatus in post-transitional modifications of secretory proteins.
1XRA.37.11 Differentiate between meiosis and mitosis and identify the stages of each process.

1XRA.38.00 UNDERSTAND/DISCUSS METABOLISM

1XRA.38.01 Define anabolism.
1XRA.38.02 Define catabolism.
1XRA.38.03 Define metabolism.

1XRA.39.00 KNOW/DISCUSS TISSUE STRUCTURE AND FUNCTION

1XRA.39.02 List each type of tissue and give an example of a location where each type might be found.
1XRA.39.03 Compare and contrast structural and functional characteristics of each of the tissue classifications.

2XRA.21.00 EXPLAIN/DIAGRAMMATICALLY REPRESENT THE PRODUCTION AND CHARACTERISTICS OF RADIATION

2XRA.21.04 Discuss various photon interactions in terms of description of interaction, relation to atomic number and applications.
2XRA.21.07 Define units of radiation measurement and provide an example of its application.

2XRA.22.00 DISCUSS/IDENTIFY THE NEED FOR RADIATION PROTECTION

2XRA.22.01 Identify and justify the need to minimize unproductive radiation exposure of humans.
2XRA.22.02 Define and distinguish between somatic and genetic radiation effects (immediate and latent), provide examples.
2XRA.22.03 Differentiate between the stochastic and non-stochastic effects of radiation exposure, provide examples.
2XRA.22.04 List the objectives of a radiation protection program and demonstrate the ability to document same.
2XRA.22.05 Identify effective dose equivalent limits for occupational and nonoccupational radiation exposure.
2XRA.22.06 Identify the acronym “ALARA” and describe the concept optimization.

2XRA.22.07 Identify the basis for occupational exposure limits: comparable risk.
2XRA.22.08 Describe the concept of negligible individual risk level (NIRL).
2XRA.22.09 Identify ionizing radiation from natural and man-made sources and list their approximate dose equivalent contributions.
2XRA.22.10 Identify legal and ethical radiation protection responsibilities of radiation workers.

2XRA.23.00 RADIOACTIVITY DETECTION-DISCUSS/DEMONSTRATE METHODS EMPLOYED FOR RADIATION MEASUREMENT
2XRA.23.01 Identify and define units of radiation for exposure, absorbed dose, dose equivalent and radioactivity.
2XRA.23.02 Define and describe the interrelationships between relative biological effectiveness and quality factors.
2XRA.23.03 Describe how the quality factor is used to determine dose equivalent.
2XRA.23.04 State why the Sievert is the appropriate unit for radiation protection work.
2XRA.23.05 Describe the theory and operation of the following radiation detection devices: ion-chambers; proportional counter; thermoluminescent dosimeters (TLD's).
2XRA.23.06 List the appropriate applications and limitations for each radiation detection device above.

2XRA.24.00 DISCUSS/DESCRIBE RADIATION SURVEYS AND IDENTIFY REGULATORY AGENCIES AND REGULATIONS
2XRA.24.01 State when a radiation protection survey should be conducted.
2XRA.24.02 Identify who should conduct the survey.
2XRA.24.03 Describe the conditions under which radiation protection surveys of equipment are made.
2XRA.24.04 Identify the various performance standards for beam directing, beam defining and beam limiting devices which are evaluated in a radiation protection equipment survey of:
2XRA.24.05 Describe procedures used to verify performance standards for equipment in 24.04, indicate potential consequences of performance standard failure.
2XRA.24.06 Describe the operation of various interlocking systems for equipment in 24.04, indicate potential consequences of interlock system failure.
2XRA.24.07 List conditions and locations evaluated in an survey for radiation protection.
2XRA.24.08 Distinguish between controlled and non-controlled areas and list acceptable exposure levels.
2XRA.24.09 Describe "RADIATION AREA" signs and identify appropriate placement sites.
2XRA.24.10 Identify the functions of the following agencies:
2XRA.24.11 Discuss the Consumer-Patient Radiation Health and Safety Act of 1981.
2XRA.24.12 Describe the function of various state and local regulations governing radiation protection practices.
2XRA.24.13 Describe the requirements and responsibilities for a radiation protection officer.

2XRA.25.00 DESCRIBE/EMPLOY PERSONNEL MONITORING AND IDENTIFY OCCUPATIONAL EXPOSURES
2XRA.25.01 Identify the need and importance of personnel monitoring for radiation workers.
2XRA.25.02 Identify and describe the following monitoring devices:
2XRA.25.03 List applications, advantages and limitations for each device in 25.02.
2XRA.25.04 Interpret personnel monitoring reports.
2XRA.25.05 List values for maximum permissible dose equivalent limits for occupational radiation exposures (annual and lifetime).
2XRA.25.06 Identify those structures which are considered critical for potential late effects for whole body irradiation exposure.
2XRA.25.07 Identify dose equivalent limits for embryo and fetus in occupationally exposed women.

2XRA.25.08 State the age proportion formula for the determination of a maximum accumulated dose equivalent.

2XRA.26.00 DISCUSS THE NEED FOR/PROMOTE PATIENT PROTECTION
2XRA.26.03 Explain the purpose and importance of patient shielding.
2XRA.26.05 Explain the ten day rule and its application to female patients of childbearing age.
2XRA.26.09 Discuss the importance of clear, concise instructions (effective communication skills) as a method of radiation protection.
2XRA.26.11 Describe the minimum source-to-tabletop distances for fixed and mobile fluoroscopes.
2XRA.26.12 Discuss safety factors for the patient (and other patients) in the room during mobile radiographic procedures.

2XRA.27.00 DESCRIBE/EMPLOY PRACTICAL RADIATION PROTECTION MEASURES
2XRA.27.01 Identify barrier materials and their use in specific x-ray installations.
2XRA.27.02 Distinguish between primary and secondary barriers.
2XRA.27.03 Describe how Use (U) influences the design of x-ray installations.
2XRA.27.04 Describe hoe Workload (W) influences the design of x-ray installations.
2XRA.27.05 Describe how Occupancy (T) influences the design of x-ray installations.
2XRA.27.06 Describe how Distance (T) influences the design of x-ray installations.
2XRA.27.07 Describe how Material influences the design of x-ray installations.
2XRA.27.08 Describe how the operation of various ancillary equipment influences radiation safety and describe the potential consequences of failure of this equipment.
2XRA.27.09 Describe how the operation of various x-ray equipment influences radiation safety and describe the potential consequences of failure of this equipment.
2XRA.27.10 Identify who should evaluate ancillary/x-ray equipment; frequency evaluations should be made; how is this related to the Quality Assurance Program for radiation safety.
2XRA.27.11 Demonstrate how time, distance and shielding can be manipulated to keep radiation exposures to a minimum.
2XRA.27.12 Perform calculations of exposure with varying time, distance and shielding.
2XRA.27.13 Discuss the relationship between half-value layer and shielding design.
2XRA.27.14 Identify emergency procedures to be followed during failures of x-ray mechanisms.

2XRA.28.00 DESCRIBE/DIAGRAMMATICALLY REPRESENT CELL STRUCTURE, CLASSIFICATION AND FUNCTION AND RADIATION EFFECTS ON CELLS
2XRA.28.01 Identify important functions of organic and inorganic cell constituents.
2XRA.28.02 List and describe the function of various cell structures and organelles.
2XRA.28.03 Describe the structure and function of the nucleus.
2XRA.28.04 Identify events occurring in mitosis and meiosis and describe each process.
2XRA.28.05 List the sequence of events in the cell cycle.
2XRA.28.06 Define differentiation.
2XRA.28.07 Distinguish between ionizing and non-ionizing radiations.
2XRA.28.08 Identify sources of electromagnetic and particulate ionizing radiations.
2XRA.28.09 Define directly ionizing radiations.
2XRA.28.10 Define indirectly ionizing radiations.
2XRA.28.11 Identify sources of radiation exposure.

2XRA.29.00 DISCUSS/DESCRIBE BIOPHYSICAL EVENTS
2XRA.29.01 Identify and distinguish between the physical and biologic units of radiation dose.
2XRA.29.02 Identify radiation induced chemical reactions resulting in the production of free radicals.
2XRA.29.03 Describe how free radical production causes biologic damage.
2XRA.29.04 Define LET and RBE.

2XRA.29.05 List and describe factors that influence RBE.

2XRA.30.00 DESCRIBE/MINIMIZE RADIATION EFFECTS

2XRA.30.01 Identify and describe types of biologic effects from radiation at the subcellular level.
2XRA.30.02 State how subcellular radiation effects are expressed in humans.
2XRA.30.03 Identify and describe types of biologic effects from radiation at the cellular level.
2XRA.30.04 State how cellular radiation effects are expressed in humans.
2XRA.30.05 Define somatic, stochastic and genetic radiation effects.
2XRA.30.06 Identify specific diseases or syndromes associated with the effects in 30.05
2XRA.30.07 Identify methods to measure radiation response.
2XRA.30.08 List physical, chemical and biologic factors influencing response.
2XRA.30.09 Distinguish between lethal and sublethal response and identify factors which influence response.

2XRA.31.00 DISCUSS RADIOSENSITIVITY AND RESPONSE AND MANIPULATE FACTORS TO MINIMIZE

2XRA.31.01 Define radiosensitivity.
2XRA.31.02 Describe how the radiosensitivity of tissues relate to mitotic rate and degree of differentiation.
2XRA.31.03 List factors influencing radiosensitivity.
2XRA.31.04 Identify various survival curve parameters.
2XRA.31.05 State how LET, oxygen and fractionation influence the shape of survival curves.
2XRA.31.06 Describe the clinical implications of those factors which influence survival curves.
2XRA.31.07 Associate the expected responses to radiation with the appropriate dose levels for the hemopoietic system.
2XRA.31.08 Associate the expected responses to radiation with the appropriate dose levels for the skin.
2XRA.31.09 Associate the expected responses to radiation with the appropriate dose levels for the digestive system.
2XRA.31.10 Associate the expected responses to radiation with the appropriate dose levels for the urinary system.
2XRA.31.11 Associate the expected responses to radiation with the appropriate dose levels for the respiratory system.
2XRA.31.12 Associate the expected responses to radiation with the appropriate dose levels for the reproductive system.
2XRA.31.13 Associate the expected responses to radiation with the appropriate dose levels for the nervous system.
2XRA.31.14 Identify factors influencing the degree of responses.
2XRA.31.15 Define and distinguish between the different levels of tolerance above.
2XRA.31.16 State the clinical significance of LD 50/30 and LD 30.
2XRA.31.17 Identify factors influencing tolerance of various tissues.
2XRA.31.18 Given specific tissue sites, state the tolerance dose.
2XRA.31.19 Describe conditions which result in a radiation syndrome.
2XRA.31.20 Associate the various stages of a radiation syndrome with the appropriate dose levels.
2XRA.31.21 Describe factors which influence responses in a radiation syndrome.
2XRA.31.22 Identify possible medical interventions used to modify a radiation syndrome.
2XRA.31.23 Define and identify possible radiation induced somatic effects.
2XRA.31.24 Define and identify possible radiation induced stochastic effects.
2XRA.31.25 Define and identify possible radiation induced genetic effects.

Required Readings/Materials

You must purchase the following required readings/materials:

Radiation Protection in Medical Radiography, Sherer/Visconti/Ritenour, 6th Ed.
Radiation Protection in Medical Radiography Workbook, Sherer/Visconti/Ritenour, 6th Ed.

COURSE REQUIREMENTS:

A. Regular and punctual attendance of all class lectures and laboratory exercise.
B. Read and discuss textbook assignments and outside readings when they are assigned.
C. Complete all course assignments to include worksheets, laboratory exercises, written papers, examinations, etc.
D. Demonstrate proficiency of the requirements set forth in this course by attainment of a grade of "C" or better.
E. **Tests -** Students will be allowed to make up tests; however, 10 points will be deducted for each class day a student fails to take the examination. It is the student's responsibility to make an appointment with the instructor for the make-up examination

METHOD OF EVALUATION

Grading Criteria:

A - 93-100
B - 84-92
C - 75-83

Weight of Course Requirements

10% Mock Registry
30% Unit Exams
15% Miscellaneous
5% Outside Assignments
40% Final Examination

ATTENDANCE POLICY

Student attendance at every class, lab and clinical practicum is expected. Students shall be prompt to class and clinical practicums. Points will be deducted from a student's final course grade for absences. (1-2 abs = .5 pt. ea.; 3-5 abs = .75 pt. ea.; 6-7 abs = 1 pt. ea.) A student is considered absent if more than 30 minutes late to lecture or lab or more than 2 hours late for clinical practicums. Four (4) or more absences will constitute an administrative drop.

ACADEMIC ETHICS:

You are expected to complete your own assignments and take tests without notes or other outside assistance. ALL WORK IS EXPECTED TO BE YOUR OWN. If unethical behavior is detected, ALL parties involved will be denied points for that project or exam. The questioned material and a report of the ethics violation will be submitted to the department chair for further action as deemed necessary by the department chair. Unethical behavior including dishonesty (cheating) on any work can be reason for dismissal from the class and ultimately the Program.

Statement of Academic Dishonesty

Ethics, Cheating and Plagiarism

"Using someone else's ideas or phrasing and representing those ideas of phrasing as our own, either on purpose or through carelessness, is a serious offense known as plagiarism. "Ideas or phrasing" includes written or spoken material, of course, from whole papers and paragraphs to sentences, and indeed, phrases. But it also includes statistics, lab results, art work, etc. "Someone else" can mean a professional source, such as a published writer or critic in a book, magazine, encyclopedia, or journal; an electronic resource such as material we discover on the World Wide Web; another students at our school or anywhere else; a paperwriting "service" (online or otherwise), which offers to sell written papers for a fee." (statement taken from http://webster.commnet.edu/mla/plagiarism.shtml)

STUDENT ASSISTANCE:
The following resources are available to assist you in successful completion of this course:

A. In the LRC - Audiovisual materials from LRC presented during course.
B. **Smarthinking** (http://Smarthinking.com)
   Smarthinking Provides live, online, on-demand tutoring and writing assistance to Odessa College students in **Mathematics (Basic Skills - Calculus II), Writing, General Chemistry, Organic Chemistry, Physics, Biology, Introduction to Human Anatomy and Physiology, Accounting, Economics, Introductory Finance, Spanish and Statistics.**
   Keep in mind that the Success Center still has 7 outstanding tutors for in-house face-to-face tutoring sessions.
C. Instructor Assistance - Instructor office hours are posted on their office doors. Instructors are available during these hours to assist students. Some office hours are at the college while others are at clinical affiliates.

SPECIAL NEEDS STATEMENT

Special Needs: Odessa College complies with Section 504 of the Vocational Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. If you have any special needs or issues pertaining to your access to and participation in this or any other class at Odessa College, please contact Becky Rivera-Weiss in the Office of Disability Services at 432-335-6861 to request assistance and accommodations.

IMPORTANT NOTES

The final examination is a comprehensive examination based on the ARRT format.

MISSED EXAMINATIONS

Students will be allowed to make up tests; however, 10 points will be deducted for each class day a student fails to schedule and complete the examination. It is the student's responsibility to schedule the retake with regards to the instructor's schedule.

SUMMARY OF ASSIGNMENTS & ACTIVITIES

Item (Name)	Type	Description
Chapter 1: Introduction to Radiation Protection Introduces the student radiographer to radiation protection. It includes a discussion of the use of ionizing radiation in the healing arts beginning with the discovery of x-ray in 1895. The chapter covers the following topics: effective radiation protection, biologic effects, justification and responsibility for radiologic procedures, diagnostic efficacy, occupational and nonoccupational dose limits, the ALARA principle, patient protection and patient education, risk versus potential benefit of radiologic procedures, and the use of background equivalent radiation time (BERT) to inform the patient of the amount of radiation that will be received from a specific x-ray procedure. Also included is a discussion about the types of radiation, the electromagnetic spectrum, particulate radiation, equivalent dose and effective dose, the biologic damage potential of ionizing radiation, natural and manmade sources of radiation, the Three Mile Island-2 and Chernobyl nuclear power plant accidents, and the use of diagnostic x-ray machines and radiopharmaceuticals in medicine.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 1		Quiz

Chapter 2: Interaction of X-Radiation with Matter Covers basic physics concepts that relate to radiation absorption and scatter. The processes of interaction between radiation and matter are emphasized to provide the background necessary for radiographers to optimally select technical exposure factors such as peak kilovoltage (kVp) and milliampere-seconds(mAs). By selecting the appropriate techniques, the radiographer can minimize the dose to the patient and produce radiographs of acceptable quality.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 3: Radiation Quantities and Units Covers the evolution of radiation quantities and units and emphasizes the desire of the medical community, from the time it became aware of the harmful effects of x-rays, to find a way to reduce radiation exposure throughout the world by developing standards for measuring and limiting this exposure. To be able to measure patient and personnel exposure in a consistent and uniform manner, diagnostic imaging personnel should be familiar with these standardized radiation quantities and units.		
Chapters 2 & 3		Quiz
Chapter 4: Radiation Monitoring covers radiation monitoring. This includes both personnel monitoring and area monitoring. Personnel exposure must be monitored to ensure that occupational radiation exposure levels are kept well below the annual effective dose (EfD) limit. Radiation survey instruments are area monitoring devices that detect and measure radiation. Radiographers and other occupationally exposed persons must be aware of the various personnel and area radiation exposure monitoring devices and their functions.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 4		Quiz
Chapter 5: Overview of Cell Biology Covers basic concepts of cell biology. The chapter begins with a discussion of the cell, followed by other related topics such as cell chemical composition including a discussion of organic compounds and inorganic compounds, cell structure, and cell division. This material provides a foundation for radiation biology that will be covered in subsequent chapters.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 6: Molecular and Cellular Radiation Biology Covers molecular and cellular radiation biology. Areas of study included in the science of radiation biology are the sequence of events occurring after the absorption of energy from ionizing radiation, the action of the living system to make up for the consequences of this energy assimilation, and the injury to the living system that may be produced. The chapter provides a basic knowledge of aspects of molecular and cellular radiation biology that are relevant to the subject of radiation protection. It also provides a foundation for radiation effects on organ systems that are covered in the next chapter.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapters 5 & 6		Quiz

Chapter 7: Early Radiation Effects on Organ Systems Radiation-induced damage at the cellular level may lead to measurable somatic and genetic damage in the living organism as a whole. This chapter focuses on early organic damage resulting from ionizing radiation exposure.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 8: Late Radiation Effects on Organ Systems Radiation-induced damage at the cellular level may lead to measurable somatic and genetic damage in the living organism as a whole. This chapter focuses on late organic damage resulting from ionizing radiation exposure.		
Chapters 7 and 8		Quiz
Chapter 9: Dose Limits for Exposure to Ionizing Radiation Discusses occupational and nonoccupational effective dose (EfD) limits and equivalent dose (EqD) limits for tissues and organs such as the lens of the eye, skin, hands, and feet. To minimize the risk of harmful biologic effects, exposure of the general public, patients, and radiation workers may be limited by adhering to established dose limits. The effective dose limiting system has been established for this purpose. Covers radiation protection standards, organizations and U.S. regulatory agencies. Current radiation protection philosophy is discussed, and goals and objectives for radiation protection are identified. Other topics covered include the ALARA concept, responsibilities of a radiation safety officer, risk of radiation-induced malignancy, action limits, and the theory of radiation hormesis.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 9		Quiz
Chapter 10: Equipment Design for Radiation Protection A description of the devices required for all diagnostic x-ray imaging systems is included in this chapter with equipment minimum requirements. Some devices are characteristic of either radiographic or fluoroscopic imaging systems, and some are mandated by federal regulation for all diagnostic imaging systems. Covers devices and ways devices are employed to reduce radiation exposure during diagnostic x-ray procedures.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 10		Quiz
Chapter 11: Management of Patient Radiation Dose during Diagnostic X-Ray Procedures Covers protection of the patient during diagnostic x-ray procedures. This involves limiting radiation exposure by employing appropriate radiation reduction techniques and by utilizing protective devices that minimize such exposure. Patient exposure can be substantially reduced by using proper body or part immobilization, motion reduction techniques, appropriate beam limitation devices and adequate filtration of the x-ray beam, and the use of gonadal or other specific area shielding. The selection of suitable technical exposure factors used in conjunction with either high-speed film-screen combinations or computer-generated digital images, correct radiographic film processing techniques or appropriate digital image processing, and the elimination of repeat radiographic exposures can also significantly limit patient radiation exposure. This chapter provides an overview	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions

of the tools and techniques radiographers use to minimize radiation exposure to patients during diagnostic x-ray procedures.		
Chapter 12: Management of Imaging Personnel Radiation Dose during Diagnostic X-Ray Procedures When fulfilling professional responsibilities associated with diagnostic imaging, imaging, radiographers may be exposed to secondary radiation (scatter and leakage), thereby increasing occupational exposure. Presents an overview of methods that may be used to reduce this exposure. Diagnostic x-ray suite protection design is also covered with emphasis on new approaches to shielding in accordance with NCRP Report No. 147.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapters 11 and 12		Quiz
Chapter 13: Radioisotopes and Radiation Protection Covers radioisotopes and radiation protection. This chapter gives a brief discourse on the usage of radioisotopes for both diagnostic and therapeutic medical procedures and discusses some relevant radiation issues. The chapter also focuses on the use of radiation as a terrorist weapon and includes some of the fundamental principles of dealing with radioactive contamination in the health care setting.	Lecture/Discussion of Key Points	Complete Worksheets & Review Questions
Chapter 13		Quiz