COURSE INFORMATION FORM

DISCIPLINE: Radiologic Technology
COURSE TITLE: Radiation Biology and Protection
CR.HR: 3.0  LECT HR: 3.0  LAB HR:  0  CLIN/INTERN HR:  0  CLOCK HR:  0

CATALOG DESCRIPTION
The principles of radiation biology and techniques used to protect the patient and personnel from the effects of exposure to ionizing radiation.

PREREQUISITES
RATE 160 with concurrent enrollment in the corresponding semester of clinical experience.

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)
Upon completion of this course, the student will be able to:

1. Justify the need for radiation protection in radiographic procedures.
2. Identify the potential for biologic damage resulting from radiation exposure.
3. Describe the objectives of a radiation protection program.
4. Categorize the sources of radiation.
5. State the legal and ethical responsibilities of the radiographer, as related to radiation protection.
6. Identify the units, methods, and measurements of radiation exposure.
7. Calculate patient exposure, when provided with one variable.
8. Compare the duties of regulatory agencies.
9. State the regulations regarding exposure to x-radiation and x-ray equipment.
10. Compare and contrast the options for personnel monitoring.
11. Apply radiation protection practices.
12. List the methods of patient protection.
13. Diagram the atom, molecule, and cell before and after radiation exposure.
14. Identify biophysical events.
15. Identify radiation effects.
16. Review the media available to the general public which pertains to radiation exposure.
17. Analyze the public perception of radiation exposure, as related to available media sources.

GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

2. Critical Thinking  
   A. Sort and classify information:
      1. Distinguish among facts, feelings, judgment, and inferences, and prioritize the respective role of each within a given context.  

Revised 9/10/10
PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

1. Students will demonstrate competence in performing clinical activities.
2. Students will communicate effectively in both oral and written formats.
3. Students will think critically and apply problem solving skills.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes will be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Written examination (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13)
2. Oral presentation (8, 11, 16, 17)
3. Written article review (12, 14, 15, 16, 17)
COURSE OUTLINE FORM

DISCIPLINE  Radiologic Technology

COURSE TITLE: Radiation Biology and Protection

Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Radiation protection
   A. Introduction
      1. Justification for radiation protection
      2. Biologic damage potential of ionizing radiation
      3. Objectives of a radiation protection program
      4. Sources of radiation
      5. Legal and ethical responsibilities of the technologist
   B. Units, detection and measurement
   C. Surveys for radiation
   D. Regulatory agencies and regulations
   E. Personnel monitoring
   F. Application of radiation protection principles
   G. Patient protection

II. Radiation biology
   A. Introduction
      1. Molecular bonds
      2. Cell biology
      3. Types of ionizing radiation
      4. Sources of medical exposure to radiation
   B. Biophysical events
   C. Radiation effects
   D. Radiosensitivity and response

III. Media and Public Education in Radiation Protection

IV. Sources of public information

V. Accuracy of media

VI. Technologist responsibility for educating the public

VII. Patient education

VIII. Education of hospital personnel

IX. Public awareness