

## MASTER COURSE OUTLINE

A. RADT 2220 Radiation Biology and Protection

B. COURSE DESCRIPTION:

This course provides the student with an overview of the principles of the interaction of radiation with the human body as well as the principles of radiation protection. Radiation effects on biological molecules and organism, as well as factors affecting biological response, are explored. Discussion includes both acute and chronic effects of radiation. Radiation protection responsibilities of the radiographer for patients, personnel, and the public are presented. Prerequisites: RADT 2215, 2283. Co-requisites: RADT 2239, 2240. This course is part of the Radiography program which is accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT).  
**(3 Cr – 3 lect, 0 lab)**

C. \*\*Core Theme: Ethical and Civic Responsibility

D. RIVERLAND INSTITUTIONAL LEARNING OUTCOMES:

This course addresses the following Riverland Institutional Learning Outcome(s):

- ILO 1: critical thinking (*Core Theme Goal 2*)
- ILO 2: awareness of the larger global community (*Core Theme Goal 7 or Goal 8*)
- ILO 3: ethical, engaged citizenship (*Core Theme Goal 9 or Goal 10*)
- ILO 4: communication and collaboration (*Discipline Goal 1 and by any learning outcome(s) involving communication or collaboration*)

E. MAJOR CONTENT AREAS:

- Introduction to radiation protection
- Interactions of x-radiation with matter
- Radiation quantities and units
- Limits for exposure
- Cell biology
- Radiation biology
- Acute radiation syndromes
- Protection of the patient during x-ray procedures
- Protection of occupationally-exposed personnel
- Radiation monitoring

F. GOAL TYPE, OBJECTIVES, AND OUTCOMES:

<u>GOAL TYPE</u>	<u>OBJECTIVES</u> Students will be able to	<u>OUTCOMES</u> The student will successfully
<u>**Ethical and Civic Responsibility</u>	understand and apply core concepts (e.g. politics, rights and obligations, justice, liberty) to specific issues.	1. demonstrate the cardinal principles of radiation protection for the patient, public, and radiation worker.
<u>CS</u>	evaluate the radiosensitivity of tissues and organs.	1. differentiate between the radiosensitivity of tissues and organs.
<u>CS</u>	describe the physical and biologic factors that affect the degree of tissue damage.	1. articulate the physical and biologic factors that affect tissue damage.
<u>CS</u>	define the early effects of radiation exposure.	1. identify the symptoms associated with the early effects of radiation exposure.
<u>CS</u>	describe the late effects of radiation exposure.	1. identify the symptoms associated with the late effects of radiation exposure.
<u>CS</u>	state the dose limits for occupational and non-occupational workers.	1. compare and contrast the radiation dose limits for occupational and non-occupational workers.
<u>CS</u>	explain the methods of reducing occupational exposure.	1. articulate radiation protection methods to reduce occupational dose.

G. SPECIAL INFORMATION:

This course may require use of the Internet, the submission of electronically prepared documents and the use of a course management software program. Students who have a disability and need accommodations should contact the instructor or the Student Success Center at the beginning of the semester. This information will be made available in alternative format, such as Braille, large print, or current media, upon request.

H. COURSE CODING INFORMATION: Course Code X/Class Maximum 20; Letter Grade

Revision date: 12/15/10; 05/07/13; 11/29/17; 03/30/22

AASC Approval date: 12/12/17; 05/03/22

<b>*Riverland Community College Disciplines</b>	<b>MnTC Goal Number</b>
Communication (CM)	<b>1</b>
Natural Sciences (NS)	<b>3</b>
Mathematics/Logical Reasoning (MA)	<b>4</b>
History and the Social & Behavioral Sciences (SS)	<b>5</b>
Humanities and Fine Arts (HU)	<b>6</b>

<b>**Riverland Community College Core Themes</b>	<b>MnTC Goal Number</b>
Critical Thinking (CT)	<b>2</b>
Human Diversity (HD)	<b>7</b>
Global Perspective (GP)	<b>8</b>
Ethical and Civic Responsibility (EC)	<b>9</b>
People and the Environment (PE)	<b>10</b>

\*These five MnTC Goals have been identified as Riverland Community College Disciplines.

\*\* These five MnTC Goals have been identified as Riverland Community College Core Themes.

NOTE: The Minnesota Transfer Curriculum “10 Goal Areas of Emphasis” are reflected in the five required discipline areas and five core themes noted in the Riverland Community College program of study guide and/or college catalog.

Riverland