

## MASTER SYLLABUS

### COURSE NUMBER AND TITLE:

RAD 342-3 Radiation Biology

### COURSE DESCRIPTION:

Designed to instruct the student radiographer in the principles and terminology of radiobiology. Emphasis will be placed on how these principles relate to radiation protection for both the patient and radiographer. Also included are introductions to nuclear medicine and radiation therapy technology.

All Radiography students must pass each of their Radiologic Science courses (RAD) with a grade of "C" or better (the minimum requirement) in order to satisfy Program requirements, and stay in the Program.

Any Radiography student that does not meet the minimum course requirement (a course grade of "C" or better) will not be allowed to continue in the Program. The student is allowed to re-apply to the Program the following year.

### COURSE OBJECTIVES:

1. List the major natural and man-made sources of radiation exposure.
2. Discuss the radiographer's radiation protection responsibility as it pertains to patients, medical personnel and the general public.
3. Differentiate between whole body and body-part radiation doses for radiographers.
4. Discuss the differences between occupational and general public radiation exposure.
5. Explain the various interactions between radiation and matter.
6. Discuss the types of devices used to detect radiation within a radiology department.
7. Describe acute and chronic exposure to radiation in terms of somatic and genetic effects.
8. Explain the terminology of radiation measurement, including the international standards.

### COURSE OUTLINE:

### PERCENTAGE:

- |   |     |
|---|-----|
| 1. Sources of radiation exposure                          | 5%  |
| 2. Cell biology   | 5%  |
| 3. Basic biological interactions of radiation             | 10% |
| 4. Cellular response to radiation                         | 10% |
| 5. Tissue radiation biology                               | 10% |
| 6. Modification of cell and tissue responses to radiation | 10% |
| 7. Radiation pathology                                    | 10% |

8. Total body radiation exposure	10%
9. Late effects of radiation exposure	10%
10. Clinical radiobiology I: diagnostic radiography & nuclear medicine	10%
11. Clinical radiobiology II: radiation therapy	10%

**MEANS OF STUDENT EVALUATION:**

Grading Scale

93 - 100 =A

85 - 92 =B

75 - 84 =C

0 - 74 =F

**PREQUISITE:** RAD 332 with a minimum grade of C.

**Co-Requisites:** RAD 312, RAD 322 and RAD 352

**TEXTBOOKS:**

1. Statkiewicz-Sherer, M.A., Visconti, P.J., Ritenour, E.R. & Haynes, K. (2018). Radiation Protection in Medical Radiography, 8<sup>th</sup> edition. St. Louis, MO: Elsevier Science/Mosby. ISBN-13: 978-0323172202.
2. Carlton, R.R. & Adler, A.M. (2019). Principles of Radiographic Imaging: An Art and a Science, 6<sup>th</sup> edition. Cengage Learning. ISBN-13: 978-1439058725.
3. Optional: Statkiewicz-Sherer, M.A., et al. (2013). Workbook for Radiation Protection in Medical Radiography, 7<sup>th</sup> edition. St. Louis, MO: Elsevier Science/Mosby. ISBN-13: 978-0323222167.