

**University of Toledo**  
**College of Medicine**  
**Master of Science in the Biomedical Sciences**  
**Medical Physics Concentration**  
**Summer 2021**

<b>Course Number:</b>	<b>MPHY6200 / MPHY8200</b>
<b>Course:</b>	<b>Radiation Protection and Regulation</b>
<b>Course Description:</b>	Course considers the hazards associated with radioactivity and electromagnetic radiation, including types and sources of radiation, radiation measurement and units, Dosimetry, radiation protection practices required by governmental regulation and medical facility accrediting bodies.
<b>Semester:</b>	Summer
<b>Credits:</b>	Three (3) Credit Hours
<b>Grading Policy</b>	50% project, 50% final exam
<b>Faculty:</b>	E. Ishmael Parsai, Ph.D. & Nicholas Sperling, Ph.D. Course TA: Enrico Deluca, M.S. Department of Radiation Oncology
<b>Time and Place</b>	<b>1:30 pm on Tuesdays</b>
<b>Prerequisite:</b>	Consent of instructor.
<b>Instruction Method:</b>	The course represents a combination of didactic lectures, text readings, out-of-class learning activities and projects, and classroom discussions.
<b>Objectives:</b>	Upon completion of the course, the student will: <ol style="list-style-type: none"><li>1. Understand the organizations involved in scientific, professional, advisory and regulatory activity in diagnostic imaging , radiation therapy, and radiation safety.</li><li>2. Have an understanding of basic units of radiation measurement and their regulatory limits.</li><li>3. Understand methods for radiation dosimetry and their application.</li><li>4. Review the basics of radiation facility shielding.</li><li>5. Review professional aspect of clinical medical physics.</li></ol>
<b>Required Text:</b>	Handouts given by course faculty.
<b>Reference Text:</b>	J. Shapiro (2002). <u>Radiation Protection (4<sup>th</sup> edition)</u> . Harvard University Press.  D.A. Golnick (1994). Basic <u>Radiation Protection Technology (3<sup>rd</sup> edition)</u> . Pacific Radiation Corporation.  NCRP Report 147: <u>Structural Shielding Design for Medical X-ray Facilities (2004)</u> . National Council on Radiation Protection and Measurement.  NRC and Ohio DOH regulations  S.R. Cherry, J.A. Sorenson & M.E. Phelps (2003). <u>Physics in Nuclear Medicine (3<sup>rd</sup> edition)</u> . Saunders.

**Radiation Protection and Regulation Course Outline:**

Topic of Lecture	Date	Instructor
Alphabet soup Scientific societies Professional organizations Advisory bodies Regulators	5/18/2020	Parsai
Radiation Units, Signs and Labels, Transporting Radioactivity Units and their applications Signage Regulations in radiation transport, Rules of Radioactive Index	5/25	Parsai/Deluca
Regulatory Dose Limits - RGE Ohio Department of Health – NewRegs	6/1	Sperling
Regulatory Dose Limits - Therapeutic Ohio Department of Health – NewRegs	6/8	Sperling
Radiation Protection Instrumentation I: External Radiation Dosimetry	6/18	Sperling
Radiation Protection Instrumentation II: Internal Radiation Dosimetry	6/22	Sperling
Practical Aspects of the Use of Radionuclides: Authorization, Training, Regulatory Standards, Personnel Monitoring, Postings, Waste, etc.	6/29	Parsai
Methods to Reduce Personnel Exposure: Handling radioactive materials and X-ray sources	6/6	Sperling
Facility Shielding of Radiation Sources	7/13	Parsai/Deluca
Radiation safety project report	7/20	Parsai/Sperling
Final Exam	7/27	Parsai/Sperling