HP - Medical Dosimetry Graduate Program

Medical Dosimetry Program
Director: Nishele Lenards
4033 Health Science Center; 608.785.6622
Email: nlenards@uwlax.edu

www.uwlax.edu/grad/medical-dosimetry/

The Medical Dosimetry Program offers a Master of Science that provides students with an educational foundation in medical dosimetry as well as clinical experience in a radiation oncology department. The curriculum requires online courses taken synchronously with a clinical internship at an affiliated site. Admission to the program is on a competitive basis.

"The Medical Dosimetrist is a member of the radiation oncology team who has knowledge of the overall characteristics and clinical relevance of radiation oncology treatment machines and equipment, is cognizant of procedures commonly used in brachytherapy and has the education and expertise necessary to generate radiation dose distributions and dose calculations in collaboration with the medical physicist and radiation oncologist" (A.A.M.D.).

This program utilizes web-based instruction for the didactic coursework. The clinical practicum courses and field work are taken at affiliated radiation oncology departments and are approximately 30-40 hours per week.

Routes of entry into Master of Science program

<table>
<thead>
<tr>
<th>Route of entry</th>
<th>Student Profile</th>
<th>Length</th>
<th>Number of Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track A</td>
<td>For radiation therapists</td>
<td>4 terms</td>
<td>46</td>
</tr>
<tr>
<td>Track B</td>
<td>For those who are not yet radiation therapists</td>
<td>4 terms</td>
<td>46</td>
</tr>
<tr>
<td>Track C</td>
<td>For certified medical dosimetrists</td>
<td>3 terms</td>
<td>31</td>
</tr>
</tbody>
</table>

2018-19 Faculty/Staff

The following is the graduate faculty and staff as of the publication date of this catalog. This list will not be updated again until the next catalog is published in June.

Clinical Associate Professor
Nishele Lenards, Program Director

Clinical Assistant Professor
Anne Marie Vann, Educational Coordinator

Administrative Support
Pete Amann
Emilee Mielke
Shauna Salow
Angela Wiste

Graduate degrees

- Dosimetry for radiation therapist (track A) - MS (http://catalog.uwlax.edu/graduate/programrequirements/medicaldosimetry/dosimetry-radiation-therapist-ms)
- Dosimetry for non-radiation therapist (track B) - MS (http://catalog.uwlax.edu/graduate/programrequirements/medicaldosimetry/dosimetry-nonradiation-therapist-ms)
- Dosimetry for certified medical dosimetrists (track C) - MS (http://catalog.uwlax.edu/graduate/programrequirements/medicaldosimetry/dosimetry-certified-medical-ms)

Courses

DOS 511 Cr.2
Imaging and Localization Concepts
The treatment planning simulation process will be reviewed to include methods of accurate patient positioning, immobilization, and tumor localization. Current imaging techniques used to acquire detailed planning data for virtual simulation will be reviewed. Techniques discussed will include, but will not be limited to: CT, MRI, ultrasound, and radionuclide scans. Web-based course. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 513 Cr.1
Anatomy for Medical Dosimetrists
Anatomical structure and function which affects treatment planning processes is addressed along with identification of anatomic structures on radiographs, CT and MRI images. Web-based course. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 514 Cr.3
Physics Fundamentals for Medical Dosimetrists
Fundamental principles of physics important to the production and use of radiation for treatment purposes are reviewed and expanded. Dose measurement utilizing a variety of methods is discussed along with the appropriate instrumentation. Calibration methods for linear accelerators are also discussed. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 515 Cr.1
Computers and Networking in Radiation Oncology
This course introduces students to basic computer terminology, features of hardware, peripherals, and clinical applications in radiation oncology. Types of networking and the components involved are discussed. Specific network protocols used in healthcare, imaging, and radiation oncology will be described. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 516 Cr.1
Fundamentals of Radiation Safety
Radiation safety measures are reviewed and updated according to federal and state mandates. Web-based course. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.
DOS 518 Cr.2

**Professional Issues in Medical Dosimetry**
This course introduces the student to professional practices of medical dosimetry including standards, scope of practice, ethics, legal perspectives, professional development, accreditation, operational issues, and continuous quality improvement (CQI) project development. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 522 Cr.2

**Radiation Dose Calculations**
This course introduces factors that affect dose delivered in radiation treatments and how these factors are accounted for in dose calculations. Web-based course. Prerequisite: DOS 511; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 523 Cr.3

**Treatment Planning in Medical Dosimetry**
Methods of treatment planning techniques for various diseases using single and multiple field arrangements using photons and electrons are discussed. Advanced treatment planning techniques of conformal radiation therapy including 3D treatment planning, IMRT, IGRT, Gating, Protons, and Stereotactic are also discussed. Prerequisite: DOS 511; acceptance into the Master of Science in Medical Dosimetry Program. Offered Spring.

DOS 525 Cr.2

**Brachytherapy for Medical Dosimetrists**
The use of Brachytherapy in radiation therapy is addressed. Characteristics of sources utilized for treatment as well as determination of source activity and dose delivered are included. Methods and instruments utilized to apply Brachytherapy treatment planning techniques to clinical treatment situations are discussed. Web-based course. Prerequisite: DOS 511; acceptance into the Master of Science in Medical Dosimetry Program. Offered Summer.

DOS 531 Cr.3

**Clinical Oncology for Medical Dosimetrists**
This course covers cancer in general as well as specific disease sites, their treatment and management of patient care during treatment. Web-based course. Prerequisite: DOS 515; acceptance into the Master of Science in Medical Dosimetry Program. Offered Spring.

DOS 541 Cr.1

**Radiobiology for Medical Dosimetrists**
This course reviews the effect of radiation on the human body in the context of radiation treatments. It particularly focuses on factors affecting the therapeutic ratio. Web-based course. Prerequisite: DOS 522; acceptance into the Master of Science in Medical Dosimetry Program. Offered Summer.

DOS 542 Cr.1

**Dosimetric Quality Assurance**
The methods and importance of periodic quality assurance procedures of treatment planning equipment and processes are covered in this course. Web-based course. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 543 Cr.1

**Seminar in Medical Dosimetry**
This course offers students an opportunity to practice answering questions and solving problems as they review course material to prepare for the national medical dosimetry certification board exam. Web-based course. Prerequisite: DOS 531; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 711 Cr.2

**Research Methodology in Medical Dosimetry I**
This course serves as an introduction of fundamental principles of research methodology and how principles are applied for conducting research in health sciences. Students will be introduced to basic terms and focus on the overall structure of the research process. The course will help students prepare to select a research topic and develop questions related to it. Library and literature resources and procedures for using them will be described in detail. Students will learn how to formulate a research hypothesis. This course will help prepare students for their own scholarly project. Web-based course. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 721 Cr.1

**Research Methodology in Medical Dosimetry II**
This course follows in sequence the Research Methodology in Medical Dosimetry I course and expands on research terminology. This course discusses ethical concerns and legal responsibilities associated with conducting research. Sampling, measuring instruments and statistics will be discussed in detail. Types of research will be described in detail while expanding on principles from the Research Methodology in Medical Dosimetry I course. Students will learn the process of writing and evaluating the final research report. Web-based course. Prerequisite: DOS 711; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 730 Cr.1

**Protocols and Studies in Radiation Oncology**
This course provides a broad overview of cancer clinical trials. Students will discuss improving the approaches to cancer prevention, diagnosis, and treatment. Advantages and disadvantages of clinical trials for patients, the general population, and health care providers are discussed. The role of the medical dosimetrist involved in clinical trials is described in depth. Web-based course. Prerequisite: DOS 711; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 741 Cr.1

**Professional e-Portfolio**
This course prepares students for the development of a professional e-portfolio. Students will discover the basic concepts of designing and creating an e-portfolio, terminology, and components included in a professional e-portfolio. Students will gather artifacts and materials throughout the program to develop a comprehensive e-portfolio project. The course will focus on additional components such as electronic multimedia files, course assessment components, self-reflections, achievements, and other reflective learning enhancements for the comprehensive e-portfolio. Web-based course. Prerequisite: DOS 731; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 750 Cr.1

**Research Methodology in Medical Dosimetry III**
This course follows in sequence with the Research Methodology in Medical Dosimetry II course and serves as the culminating research course. Students will utilize peer review and editing, and various elements of individualized instruction while preparing their final research report. Students will be prepared to have their final reports in a publishable format to enter the AAMD national student writing competition. Web-based course. Prerequisite: DOS 731; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.
DOS 771 Cr.5  
**Dosimetry Clinical Practicum I**  
Students gain clinical experience in Simulation patient set-ups and imaging studies, physics and radiation safety in the clinical environment, anatomical contour segmentation, and computers and networking within the radiation oncology field. Students will begin basic calculations and treatment planning while being introduced to brachytherapy procedures. Prerequisite: DOS 511; acceptance into the Master of Science in Medical Dosimetry Program. Offered Spring.

DOS 772 Cr.5  
**Dosimetry Clinical Practicum II**  
Students continue to gain clinical experience at an affiliated clinical internship site by concentrating on more advanced treatment planning and Brachytherapy procedures while continuing to learn the various concepts of clinical oncology specific to patient treatments. Prerequisite: DOS 771; acceptance into the Master of Science in Medical Dosimetry Program. Offered Summer.

DOS 773 Cr.5  
**Dosimetry Clinical Practicum III**  
Students continue to improve their treatment planning and dosimetric skills, concentrating on advanced planning methods and quality assurance techniques. Prerequisite: DOS 772; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall.

DOS 781 Cr.3  
**CMD Seminar I**  
This seminar course is the first in a series of three designed exclusively for students in the master's degree completion program (Track C) who are currently certified medical dosimetrists. The course provides the student with directed study and review of professional didactic course content. The course also provides the opportunity for practice examinations and group study support (online). Examinations will be given to test mastery of this didactic content. Students will have the opportunity to apply this didactic content in their fieldwork placements. Content covered in this course includes: Advanced Imaging, Simulation for Medical Dosimetrists, Anatomy for Medical Dosimetrists, Physics Fundamentals, and Computers & Networking in Radiation Oncology. Web-based course. Prerequisite: acceptance into Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 782 Cr.3  
**CMD Seminar II**  
This seminar course is the second in a series of three designed exclusively for students in the master’s degree completion program (Track C) who are currently certified medical dosimetrists. The course provides the student with directed study and review of professional didactic course content. The course also provides the opportunity for practice examinations and group study support (online). Examinations will be given to test mastery of this didactic content. Students will have the opportunity to apply this didactic course in their fieldwork placements. Content covered in this course includes: Professional courses reviewed include Radiation Safety, Professional Issues, Dose Calculations, Teletherapy Treatment Planning, and Conformal Treatment Planning. Prerequisite: DOS 781; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 783 Cr.3  
**CMD Seminar III**  
This seminar course is the third in a series of three designed exclusively for students in the master's degree completion program (Track C) who are currently certified medical dosimetrists. The course provides the student with directed study and review of professional didactic course content. The course also provides the opportunity for practice examinations and group study support (online). Examinations will be given to test mastery of this didactic content. Students will have the opportunity to apply this didactic content in their fieldwork placements. Content covered in this course includes: Brachytherapy, Clinical Oncology, Radiobiology, and Quality Assurance. Prerequisite: DOS 782; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 791 Cr.4  
**Fieldwork I**  
This level one fieldwork experience is an opportunity to demonstrate the practice of medical dosimetry in the clinical environment at a basic level. The course provides an opportunity to integrate the didactic curriculum learned for the successful completion of the MDCB exam. The focus of case studies will include imaging, patient treatment setups, anatomical contour segmentation, and computers and networking physics, and radiation safety. Supervision is provided by medical physicist and radiation oncologists. Prerequisite: acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 792 Cr.4  
**Fieldwork II**  
This level two fieldwork experience is an opportunity to demonstrate the practice of medical dosimetry in the clinical environment at an intermediate level. The course provides an opportunity to integrate the didactic curriculum learned for the successful completion of the MDCB exam. The focus of case studies will include professional issues, radiation dose calculations, treatment planning, Brachytherapy, and clinical oncology. Supervision is provided by medical physicist and radiation oncologists. Prerequisite: DOS 791; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.

DOS 793 Cr.4  
**Fieldwork III**  
This level three fieldwork experience is an opportunity to demonstrate the practice of medical dosimetry in the clinical environment at an advanced level. The course provides an opportunity to integrate the didactic curriculum learned for the successful completion of the MDCB exam. The focus of case studies will include radiobiological principles, dosimetric and departmental quality assurance processes, advanced treatment planning techniques, and seminar work. Supervision is provided by medical physicist and radiation oncologists. Prerequisite: DOS 792; acceptance into the Master of Science in Medical Dosimetry Program. Offered Fall, Spring, Summer.