MHScMRS MASTER OF HEALTH SCIENCE IN MEDICAL RADIATION SCIENCES

MHScMRS Curriculum
Existing Course Descriptions

MSC1500: Advanced Radiotherapy & Medical Physics

Info: 0.5 credits (Fall Y1)
Pathways: all
This course will provide learners with a conceptual framework with which to evaluate current advances in the design, delivery, and assessment of modern radiation treatment. Fundamental principles driving development and research in: the optimization of dose delivery; the constantly evolving role of imaging for radiotherapy; the recent advances in radiobiology; and the implications of these advances for radioprotection, will be addressed. This course will offer a multidisciplinary approach at the intersection of clinical, physics, biological, and technical expertise. The course is organized as a seminar series, where groups of experts will focus on gaps in knowledge as well as on the present and future directions in various aspects of radiation medicine. Basic physics will be taught in a pragmatic way, with equations and fundamental principles described alongside practical radiation medicine application. By its conclusion, this course will have provided the learner a vision of where radiation medicine is going, as well as a strong physics foundation allowing them to play an active role in optimizing the application of radiation therapy and in innovating for the future use of radiation in treating disease.

MSC1501: Frontiers of Radiation Medicine Research

Info: 0.5 credits (Winter/Summer Y1)
Pathways: all
This course introduces the learner to the principles and conduct of radiation medicine research in the clinical environment, through exposure to current research projects being carried out within the University of Toronto and the radiation medicine community at large. Application of fundamental research methods, including the value of knowledge translation and research dissemination, will be highlighted and encouraged across the complete spectrum of radiation medicine research including: basic biologic research and experimental therapeutics, basic and applied medical physics research, translational biological and clinical research including quality of life studies, and health outcomes epidemiological research. Relating closely to the concurrently offered MSC1508 (Principles of Radiation Medicine Research), concepts in this course will be put into action through development of a research grant proposal in a topic of interest to the student.

MSC1502: Emerging Tools in Precision Medicine in Oncology

Info: 0.5 credits (Winter/Summer Y1)
Pathways: Clinical & Research
In an era where dramatic improvements in the quality and sophistication of radiotherapy are being achieved, the concept of personalized medicine is coming to the fore. This has brought about the opportunity to integrate the practice of precision radiation medicine with emerging science related to cancer genomics, molecular targeting, and “big data”. This integration presents an exciting turning point in the treatment of cancer as we can begin to capitalize on the new information coming from each field. This graduate half-course, delivered over two semesters, serves as an introduction to the convergence of these domains and important questions about cancer and its treatment. Assessment will focus on the learner’s ability to synthesize information from the literature in identifying and exploring a gap in current knowledge, suggesting opportunities to create synergies for improving our ability to

appropriately select patients and to customize their treatments according to their individual characteristics.

MSC1503/4: Clinical Reasoning & Decision-Making I & II

Info: 0.5 credits each (Fall/Winter Y1)
Pathways: all
In this course, systematic approaches to clinical decision-making will be explored, as they apply to radiation therapy for cancer, from the perspective of the complex interplay of factors in three key domains: tumour biology, technical radiotherapy, and the individual patient. Each course will highlight gaps in current clinical science literature relating to a variety of primary cancer sites. Learners will engage in decision-making exercises based on these issues. Learners will integrate existing clinical, theoretical, and scientific knowledge to debate, justify and deconstruct the rationale for current clinical practice.

MSC1506: Professional & Clinical Leadership I: Making the Leader

Info: 0.5 credits (Fall Y1)
Pathways: all
This course will introduce the principles of leadership in healthcare, and the characteristics that contribute to a strong clinical and professional radiation therapy leader in the 21st century. Individual leadership styles and characteristics will be highlighted and contrasted, and learners will be engaged in reflective exercises to appreciate and build their own attributes and cognitive styles as leaders. The concepts of communication, team dynamics, and mentorship will be explored as they relate to strong leadership, using the National Health Service's Healthcare Leadership Model as a framework. This interdisciplinary course will draw on guest lecturers in the various content areas to expose learners to the multiple facets of leadership in the health care environment.

MSC1507: Clinical Competence & Continuous Learning

Info: 0.5 credits (Summer Y1)
Pathways: all
Attaining and maintaining clinical competence is a life-long undertaking for health care professionals. Assessing needs and gaps and establishing professional goals is fundamental to developing appropriate strategies for achieving competence. Proving and attesting to competence is also critical in education and in practice for regulated health professionals. In this course, learners will be introduced to the concepts and theories that form the cornerstone of teaching, learning and evaluation in the workplace. It will include exposure to the tools that can be used to monitor and evaluate their own competence, as well as for mentoring and guiding others in the world of competency-based education. Course activities will allow learners to apply the theories and tools to the educational and practice environments.

MSC1508: Principles of Radiation Medicine Research

Info: 0.5 credits (Winter/Summer Y1)
Pathways: all
This course will provide the learner with the knowledge and support to prepare for the conduct of practice-related research. It focuses on the theoretical underpinnings and practical issues involved in the design of novel research as a principal investigator, from framing a research question based on

comprehensive literature review to the intricacies of quantitative and qualitative methodological approaches, data collection, and analysis. This will help the learner to conceive, design and operationalize a research proposal for a master level project in radiation medicine practice. This course will be delivered via regular seminars, which will identify and explore the skills and topics relevant to critical stages of the research process. Students will receive reading material for each step of the research process and then apply that knowledge through the development of their own research proposal.

MSC1509: Master's Research Project

Info: 0.5 credit (Winter/Summer Y2)
Pathways: All
In this course, learners will conduct the major research project proposed during MSC1508H, likely (but not necessarily) within the environment and practice-related context selected for the Internship. Following approval from all relevant research ethics bodies, the learner will complete all the activities necessary to implement a live research project. Learners will collect and analyze data to answer the research question then effectively present findings to their peer group, and prepare them appropriately for broader dissemination.

MSC1510: Internship I

Info: 1.0 credit (Winter Y2)
Pathways: All
This is the first of two, 1.0 credit internship courses designed as the competency development segment of the program. The goal of this first experience-based immersive practicum is to allow the student to consolidate the theory and principles of the didactic portion of their program with the chosen professional environment, according to their individual pathway (clinical, leadership, or research). They will have an approved plan outlining their individual learning goals as well as for the portfolio of evidence they will compile based on those learning needs, established with the guidance of the Faculty Supervisory Committee,. During this course, the learner will address the identified basic competencies for the area of specialization under direct supervision of the Local Practicum Supervisor at the local site. The Local Practicum Supervisor will be responsible for supervising the student and assisting him/her in the achievement of their course goals.

MSC1511: Internship II

Info: 1.0 credit (Summer Y2)
Pathways: All
This second internship course is designed to allow the student to build on basic competency in the area of specialization by progressing to the higher order activities pertinent to becoming a leader in their chosen pathway. Students will use their existing Learning Plan and revise if necessary in consultation with the Course Director and Local Practicum Supervisor, under the guidance of the Faculty Supervisory Committee. Basic competency activity will be undertaken with minimal or indirect supervision while higher-level activities will continue to be supervised directly by the Local Practicum Supervisor.

MSC1512: Improving Cancer Outcomes with Survivorship Research

Info: 0.5 credits (Summer Y1)

Pathways: all
Cancer Survivorship has been a neglected field of study in cancer research, and in keeping with national recommendations, health professionals should be equipped to address the health care and quality of life issues facing cancer survivors. The Canadian Institute for Health Research has endorsed five areas of study: evaluating models of care, identifying mechanisms underlying long term effects, describing the needs and characteristics of unique populations, measurement and effective tool development and development of effective interventions. These areas will frame the content of this course, which will run as a seminar series delivered by guest survivorship researchers (scientists, clinicians and educators). Each will be invited to present current research issues they are addressing in their research programs, discuss the methodological challenges, and present the findings of the studies they have chosen to highlight.

MSC1513H: Seminars in Cancer Care Leadership

Info: 0.5 credits (Fall/Winter Y1)
Pathways: Leadership
The course will be offered across two semesters and will complement Professional and Clinical Leadership I&II (MSC1506 and 1514). Key thought leaders in the cancer care system will be selected to engage students in discussion on current and pressing challenges in health care, specifically in cancer care in Ontario (ie access to care, the role of industry in healthcare, health economics, privatization of healthcare etc). Topics addressed in MSC1506 and MSC1514 will be considered from the perspective of leaders at various relevant clinical cancer care institutions, professional and government organizations, and advocacy groups.

MSC1514: Professional & Clinical Leadership II: Influencing the System

Info: 0.5 credits (Fall Y1)
Pathways: Leadership
This course will follow Professional & Clinical Leadership I, and continue to use the National Health Service Healthcare Leadership Model to introduce the learner to systems considerations in healthcare leadership. Radiation therapy, as an integral element of cancer care, will serve as a context to explore such theoretical principles as professionalization, self-regulation, strategic leadership, organizational governance and accountability, and advocacy - taking into account local, national and international health care trends. Other allied health perspectives may also be considered throughout the course, as applicable. This interdisciplinary course will draw on guest lecturers in the various content areas to expose learners to the multiple facets of leadership in the healthcare environment.