

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Nuclear Engineering and Radiological Sciences

Martha M. Matuszak, assistant professor of nuclear engineering and radiological sciences, Department of Nuclear Engineering and Radiological Sciences, College of Engineering, is recommended for promotion to associate professor of nuclear engineering and radiological sciences, without tenure, Department of Nuclear Engineering and Radiological Sciences, College of Engineering.

Academic Degrees:

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| Ph.D. | 2007 | University of Michigan, Nuclear Engineering and Radiological Sciences, Ann Arbor, MI |
| MS | 2003 | University of Michigan, Nuclear Engineering and Radiological Sciences, Ann Arbor, MI |
| BSE | 2002 | University of Michigan, Nuclear Engineering and Radiological Sciences, Ann Arbor, MI |

Professional Record:

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| 2022 – present | Clinical Professor, Department of Radiation Oncology, University of Michigan |
| 2016 – 2022 | Clinical Associate Professor, Department of Radiation Oncology, University of Michigan |
| 2015 – present | Assistant Professor, Department of Nuclear Engineering and Radiological Sciences, University of Michigan |
| 2013 – 2015 | Adjunct Assistant Professor, Department of Nuclear Engineering and Radiological Sciences, University of Michigan |
| 2012 – 2016 | Clinical Assistant Professor, Department of Radiation Oncology, University of Michigan |
| 2009 – 2012 | Clinical Instructor, Department of Radiation Oncology, University of Michigan |

Summary of Evaluation:

Teaching: Professor Matuszak has taught NERS 581, *Radiation Therapy Physics*, several times. She has also been the primary instructor in NERS 588 *Medical Physics Practicum*. In addition, she has given guest lectures in several courses ranging from the undergraduate to graduate level. She has mentored undergraduate and graduate students, as well as medical residents. Her classroom teaching evaluations by students have been consistently in the high fours to five. She has contributed to Diversity, Equity, and Inclusion by mentoring a range of residents and students from underrepresented and marginalized groups. Her development and leadership of the Medical Physics Certificate Program has been a major contribution to the educational mission of the NERS department, the College of Engineering, and the Medical School.

Research: Professor Matuszak's research focuses on the use of advanced planning and delivery strategies to improve patient outcomes with radiation therapy. Her research has made notable contributions to function-guided radiation therapy and utility-based treatment planning. She has provided leadership in many capacities, both in the Medical School and in professional organizations. She has published a total of 110 journal papers, some of which have been cited extensively. She has received robust funding from both industry and government. One reviewer recommends that she increase the breadth of her funding sources and lead an NIH grant as PI.

Recent and Significant Publications:

Polan DF, Epelman MA, Wu VW, Sun Y, Varsta M, Owen DR, Jarema D, Matrosic CK, Jolly S, Schonewolf CA, Schipper MJ, Matuszak MM, "Direct incorporation of patient-specific efficacy and toxicity estimates in radiation therapy plan optimization." *Medical Physics*: 2022. PM35994026.

Niraula D, Jamaluddin J, Matuszak MM, Haken RKT, Naqa IE, "Quantum deep reinforcement learning for clinical decision support in oncology: application to adaptive radiotherapy," *Scientific Reports* 11(1): 23545, 2021. PM34876609/PMC8651664.

Paradis KC, Matuszak MM, "The Medical Physics Management of Reirradiation Patients," *Seminars in Radiation Oncology* 30(3): 204-211, 2020. PM32503784.

Matuszak MM, Kashani R, Green M, Lee C, Cao Y, Owen D, Jolly S, Mierzwa M, "Functional Adaptation in Radiation Therapy," *Seminars in Radiation Oncology* 29(3): 236-244, 2019. PM31027641.

Owen DR, Boonstra PS, Viglianti BL, Balter JM, Schipper MJ, Jackson WC, El Naqa I, Jolly S, Ten Haken RK, Kong FS, Matuszak MM, "Modeling Patient-Specific Dose-Function Response for Enhanced Characterization of Personalized Functional Damage," *International Journal of Radiation Oncology Biology Physics* 102(4): 1265-1275, 2018.

Service: The list of service contributions by Professor Matuszak is very long. She is currently the associate chair of the Department of Radiation Oncology in the Medical School, and the director of the Physics Division. She is the founding director of the Medical Physics Certificate Program, a joint program of the NERS Department and the Medical School. Her service to the professional community includes several associate editorships, roles as chair, co-chair or member of over a dozen professional-society committees; Medical Physics Board examiner, and multiple positions in the Michigan Radiation Oncology Quality Consortium, including as co-director.

External Reviewers:

Reviewer A: "...Dr. Matuszak is a highly valued medical physicist-scientist and leader in the field whose work in the medical physics field is essential, and who remains on a strong trajectory to continue to move the field forward."

Reviewer B: "...she is considered an expert in motion management during radiotherapy for lung cancer patients.... For our specialty and her faculty track, this level of academic productivity and impact is at least within the top 5% of all medical physicists in radiation oncology."

Reviewer C: "Dr. Matuszak is an excellent teacher. This is demonstrated not only by her consistent participation in national symposia and invited lectures, but by the many

undergraduates she's instructed and by those whose dissertation committees she's served upon. All of these individuals can consider themselves fortunate to have had her guidance and instruction."

Reviewer D: "Her expertise in translational research and clinical application is a major value to an engineering department and impactful in the education of future engineers with an interest in medicine."

Reviewer E: "Dr. Matuszak is nationally recognized for her meticulous and innovative research in treatment planning and radiation therapy. She is one of very few physicists with a great combination of research skills, leadership and clinical knowledge.... Her lectures on a variety of topics are always well polished and interesting. Dr. Matuszak is also a very strong mentor."

Summary of Recommendation: Professor Matuszak enjoys a strong national reputation as a researcher and leader. She has a strong publication record and is highly cited. She has robust research funding from industry and government. She has provided excellent service and leadership on many fronts, both at the University of Michigan and nationally. It is with the support of the College of Engineering Executive Committee that I recommend Martha M. Matuszak for promotion to associate professor of nuclear engineering and radiological sciences, without tenure, College of Engineering.



Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2023