FALL 2022

MSE 690 SEMINAR SERIES

FRIDAY, NOVEMBER 4TH, 2022 | 3:45PM–5:00PM

ARMS 1010

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"Materials in Medical Devices: A 21 Year Journey of Materials Challenges and Curiosities"

Abstract: Modern medical devices and their related therapy development over the last 60-70 years have been one of the wonders of modern medicine. The ability of these innovations to alleviate pain, restore health and extend life rival some of the greatest inventions of the 20th and 21st century. The intersection and collaboration of several engineering disciplines is essential to the creation and mass production of these devices. The interaction of materials engineering professionals is one of the key parts within this ecosystem. This talk will highlight some of the medical technologies Medtronic manufactures to enhance lives around the world. We will also review some of the materials engineering techniques, complexity, and cleverness to engineer some of the industry-leading medical devices. The uniqueness of the performance and reliability requirements will be covered, highlighting what makes the medical device industry unique from other high-reliability industries. Finally, we will take a journey through a 20+ year career through the medical device world from one materials engineer's perspective, highlighting materials challenges encountered, the people met during the way, and the future materials-related challenges which will enable future successes and therapies for future generations.

Biography: Peter C. Tortorici is a Medtronic Technical Fellow, and the Direct of Technology Development for the Operations Innovation organization at Medtronic, located in Minneapolis, MN. He has been with Medtronic since 2001. He currently leads a group scouting and developing manufacturing technologies a wide-variety of Medtronic businesses. The group partners with manufacturing facilities technology groups, and research on roadmaps and device manufacturing strategies. He also collaborates with research, operations, and technology to drive common business objectives and business strategy. Peter has held a variety of wide-spanning positions during his Medtronic career. He began his Medtronic career as a microelectronics process engineer, migrated to being the Medtronic corporate printed circuit board engineer, worked on lead-free solder alloy development and reliability, and was a microelectronics process development manager. He led complex problem-solving teams at Medtronic, resulting in the development of a curricula which has been taught at the corporate level. In his current role, he leads a technology group scouting technologies for manufacturing environments from additive manufacturing of materials for medical applications, to the industrialization of augmented reality for operations use cases. Prior to his career at Medtronic, Peter was a metal component program manager for the lighting division of General Electric and a microelectronics packaging engineer at Hewlett-Packard. He was a visiting research scientist at the Forschungszentrum Jülich, Germany and worked in the early development of Nd-Fe-B permanent magnets at General Motors during his Purdue Co-Operative Education experience in Anderson, Indiana. Dr. Tortorici also has instructed a ceramics engineering class at Arizona State University on an adjunct basis. Dr. Tortorici holds B.S., M.S., and Ph.D. degrees in Metallurgical and Materials Engineering from Purdue University in West Lafayette, IN. His Ph.D. graduate work focused on the diffusional interactions of molybdenum disilicide with metallic reinforcements for high temperature engine applications. His M.S. engineering work studied the diffusional interaction of austenitic and ferritic cladding steels with metallic nuclear fuel fission products. He is a member of ASM International, The Materials Society (TMS), The American Ceramic Society (ACerS), SMTA and holds two US Patents. He was inducted into the Medtronic Technical Fellow organization in 2017 and was awarded a corporate Star of Excellence award in 2011. He was inducted into the Purdue co-operative education hall of fame in 2019 and awarded the Purdue Outstanding Materials Engineer (OSME) Award for his career in the medical device industry in 2020

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