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Friday, March 22 | **Macdonald Engineering (MDENG267)** | 10:00-11:00 AM

Title | Next Generation Membrane Materials for Desalination and Wastewater Reuse

Abstract | Water scarcity is one of the greatest global crises of our time. Increasing water supply beyond what is available from the hydrological cycle can be achieved by seawater desalination and wastewater reuse. Highly effective, low-cost, robust technologies for desalination and wastewater reuse are needed, with minimal impact on the environment. However, progress in current state-of-the-art water purification membranes has been limited due to inherent limitations of conventional membrane materials. We will first discuss the state-of-the-art of existing membrane technologies for water purification and desalination, highlight their inherent limitations, and establish the critical needs for next-generation membranes. We will then describe molecular-level design approaches to fabricate highly selective membranes, focusing on novel materials such as aquaporin, synthetic nanochannels, and self-assembled block copolymers.

Bio | Menachem Elimelech is the Roberto Goizueta Professor at the Department of Chemical and Environmental Engineering at Yale University. His research focuses on membrane-based technologies at the water-energy nexus, materials for next-generation desalination and water purification membranes, and environmental applications of nanomaterials. Professor Elimelech was the recipient of numerous awards in recognition of his research contributions. Notable among these awards are the 2005 Clarke Prize for excellence in water research; election to the US National Academy of Engineering in 2006; Eni Prize for 'Protection of the Environment' in 2015; and election to the Chinese Academy of Engineering in 2017. Professor Elimelech is also a Highly-Cited Researcher in two categories (Chemistry and Environment/Ecology). Professor Elimelech has advised 39 PhD students and 32 postdoctoral researchers, many of whom hold leading positions in academia and industry. In recognition of his excellence in teaching and mentoring, he received the W.M. Keck Foundation Engineering Teaching Excellence Award in 1994, the Yale University Graduate Mentoring Award in 2004, and the Yale University Postdoctoral Mentoring Prize in 2012.

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