

# Environmental Engineering Seminar

The Astani Department of Civil & Environmental Engineering presents



**Prof. Roland D. Cusick**  
**Environmental Engineering**  
**University of Illinois at Urbana-Champaign**

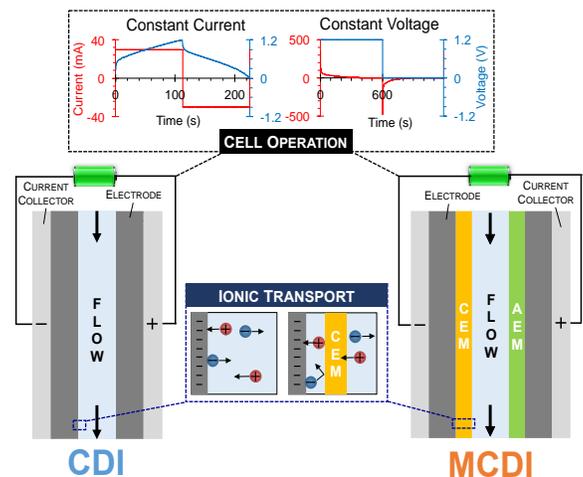
Date: March 24, 2016

Time: 2 - 3 pm

Place: LVL 17

## Elucidating the potential of capacitive energy storage technologies for brackish water desalination

Capacitive materials, which store electrochemical energy by concentrating ions within electric double layer potential gradients, have received increased attention as a potential energy efficient alternative to reverse osmosis (RO) desalination. While the number of publications focused on capacitive deionization (CDI) and membrane capacitive deionization (MCDI) has increased exponentially over the last few years, little effort has been spent on evaluating the actual energy consumption and potential capital and operating cost of these systems in comparison to RO. In this talk, I will summarize the current literature; identify interactions between material characteristics, operating decisions and energy consumption; and model the impact of enhancing key performance parameters on CDI and MCDI capital and operating cost at full scale.



### About the Speaker

Roland Cusick is an Assistant Professor of Environmental Engineering in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign. Roland received his BS in Environmental Engineering from UC Riverside in 2005, and his MS and PhD from Penn State University in 2010 and 2013. His graduate work resulted in 17 research articles published in high impact journals including *Science*, *Energy & Environmental Science* and *Environmental Science & Technology*. His research group at UIUC focused on the development of environmental electrochemical technologies for resource recovery and desalination.