COLLEGE OF ENGINEERING AND COMPUTER SCIENCE

# FACULTY RESEARCH TALKS

## LISTEN. LEARN. COLLABORATE.

**Zoom talk | Friday, Mar. 31, 2023 | Noon to 1 p.m.**

PRESENTER 1:
**KELLY KIBLER**
Associate Professor
Civil, Environmental and Construction Engineering,
UCF Coastal

### Natural Infrastructure Designs to Enhance Resiliency Based On Discoveries from Ecohydraulics Research

As climatic hazards related to sea level rise and a changing hydrosphere intensify, there is increasing societal interest to leverage ecosystem services provided by natural infrastructure to combat issues of flooding and erosion. This talk will highlight the application of ecohydraulics research to the design of natural infrastructure. The study of hydrodynamics and mass transport within the complex three-dimensional biological canopies found in natural aquatic ecosystems improves the understanding of flow resistance and sediment transport mechanisms to benefit the design of infrastructure for applications such as bank stabilization.

Dr. Kibler is an associate professor of water resources engineering and a Faculty Fellow of UCF's Center for Global Economic and Environmental Opportunity. She obtained her Ph.D. from Oregon State University and worked with the U.N. Environmental, Scientific and Cultural Organization, or UNESCO, before joining the UCF faculty. Dr. Kibler's Ecohydraulics Laboratory undertakes research at the crossroads of engineering and aquatic ecology and has been funded by the NSF (including an NSF CAREER Award), DARPA, EPA, NOAA, the Florida Department of Environmental Protection and the Florida Department of Transportation.

PRESENTER 2:
**ALEKSANDAR DIMITROVSKI**
Associate Professor
Electrical and Computer Engineering,
RISES Cluster

### Gyrator-Capacitor Approach to Modeling Electromagnetic Control Devices

In order to accurately understand the interaction between the power system and electromagnetic control devices, gyrator-capacitor (G-C) modeling has been proposed as an approach that offers important advantages. Traditional representation of magnetic circuit reluctances with electric circuit resistances confuses energy storage and energy consumption elements. The G-C approach maintains the power invariance and creates a direct link between the magnetic and the electric domains for an integrated analysis.

Before joining UCF, Dr. Dimitrovski worked in research institutions, the power industry and academia, both in Europe and the U.S. He received his B.Sc. and Ph.D. degrees in electrical engineering with an emphasis in power, and his M.Sc. degree in applied computer sciences. His research area of interest is focused on modeling, analysis, protection and control of uncertain power systems.

### Bulky Monomers for Biodegradable, High Tg Polyesters

PRESENTER 3:
**KAITLYN CRAWFORD**
Assistant Professor,
Materials Science and Engineering,
Biionix Cluster

Plastics enable our modern standard of life from safety and shelter to advanced technologies in electronics and aerospace applications. However, there are serious and legitimate economic, energy and environmental concerns in using plastic. This seminar focuses on the development and characterization of new diol and diacid monomers to form biodegradable polyesters using step-growth polymerization. The discussion will include synthesis optimization to achieve high-yielding monomers and polymers with glass transition temperatures ≥80 °C; polymer processing into thin films and microfibers using a custom-built centrifugal force spinner; and an evaluation of the polymer's corresponding structure-property relationship with respect to mechanical, optical, diffusive and deteriorative properties.

Dr. Crawford's research focuses on developing wearable electronics and identifying new materials for sensing and energy applications with environmental sustainability in mind. She studied bioelectronics as a postdoctoral researcher at Northwestern's Querrey Simpson Institute Bioelectronics, and at the University of Illinois, Urbana-Champaign. She received her Ph.D. in chemistry from the University of Maryland, College Park and M.S. in chemistry from North Carolina State University, Gorman. Dr. Crawford is a contributing author on several peer-reviewed articles and has received more than 12 awards related to research and teaching. Visit the Crawford Group web page to learn more: kcrawfordgroup.com

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