Printed, flexible and even stretchable electronics have potential as low cost alternatives for devices in application ranging from energy to health care to security. However, their successful commercialization relies on the design and development of sustainable, robust and reliable materials and processes. Molecular design plays a significant role in determining materials electronic performance, but structure is not the only consideration. Device performance also depends critically on semiconductor alignment at many length scales. Importantly, materials’ nano- through meso-structure can be manipulated in solution prior to device fabrication, and the macroscopic long-range order required for high performance devices may be achieved through process optimization which utilizes materials structure-process-property relationships. This presentation will provide an overview of how structure-process-property relationship consideration can be applied to several classes of advanced electronic materials – from devices to energy storage and conversion.

Biography:
Elsa Reichmanis is Professor and Pete Silas Chair in Chemical Engineering in the School of Chemical and Biomolecular Engineering of the Georgia Institute of Technology. Prior to joining Georgia Tech, she was Bell Labs Fellow and Director of the Materials Research Department, Bell Labs, Murray Hill, NJ. She received her Ph.D. and BS degrees in chemistry from Syracuse University. She is a member of the National Academy of Engineering and has received several awards for her work, including the 1999 ACS Award in Applied Polymer Science, 2018 ACS Award in the Chemistry of Materials, and the 2018 AIChE Margaret H. Rousseau Pioneer Award for Lifetime Achievement by a Woman Chemical Engineer. She is also a Society of Chemical Industry Perkin Medal recipient. She has been active in professional societies, having served as 2003 President of the ACS; has participated in many National Research Council activities; and is an Executive Editor for the ACS journal, Chemistry of Materials. Her research, at the interface of chemical engineering, chemistry, materials science, optics, and electronics, spans from fundamental concept to technology development and implementation. Her interests include the chemistry, properties and application of materials technologies for photonic and electronic applications, with particular focus on polymeric and nanostructured materials for advanced technologies. Currently, efforts aim to identify fundamental parameters that will enable sub-nanometer scale dimensional control of organic, polymer and/or hybrid materials for electronic applications.