

## Department of Systems Engineering and Engineering Management

### Seminar Series

# **Synergistic Product Design & Operations Management: Opportunities & Barriers to Economic and Environmental Sustainability**

## **Prof. Gül E. Kremer**

Professor and C.G. "Turk" and Joyce A. Therkildsen Department Chair  
Industrial and Manufacturing Systems Engineering Department  
Iowa State University, USA

Date	14 November 2017 (Tuesday)
Time	3:30pm - 4:30pm
Venue	P7303, Yeung Kin Man Academic Building (AC1)

### **Abstract**

Sustainable design and manufacturing efforts have been initiated, but are incomplete without simultaneous consideration of manufacturing process and the supply chain costs and environmental impacts during conceptual design of components. Currently, manufacturing and supply chain perspectives are primarily considered during detail design – the final phase of product design when much of the design flexibility has been removed. These shortcomings motivate an integration of cradle-to-gate life cycle decisions to optimize component production and supply chain alternatives early in design. A summary of lessons learned will be provided resulting from collaborative work that undertook: (1) Automated modular architecture generation and analysis, (2) Development of models of manufacturing and supply chain processes through industrial and experimental process investigations, and (3) Optimization to balance cost and environmental sustainability metrics from procurement through end of life. Our results, which feature innovative applications of MIP, bilevel programming, and stochastic programming, point to the importance of the product architecture as a customization platform to supply globally while optimizing different performance measures for different contexts.

Dr. Kremer will also briefly summarize her group's research accomplishments in healthcare and design analytics domains.

### **About the Speaker**

**Gül E. Kremer** is a Professor and C.G. "Turk" and Joyce A. Therkildsen Chair of the Department of Industrial and Manufacturing Systems Engineering at Iowa State University. Before joining ISU in 2016, she has served in several leadership roles within Penn State, including Chair of the Engineering Faculty Council, Engineering Caucus Leader, Chair of Engineering Curriculum Committee and Chair of the University Planning Committee. Dr. Kremer has degrees in industrial engineering from Yildiz Technical University, an MBA from Istanbul University and a PhD in Engineering Management from Missouri University of Science and Technology. She was a National Research Council-US AFRL Summer Faculty Fellow in the Human Effectiveness Directorate from 2002 to 2004, and a Fulbright Scholar (2010-2011). She served as a Program Director in the National Science Foundation's Division of Undergraduate Education between 2013 and 2016. Dr. Kremer's research interests include applied decision analysis to improve complex products and systems, and engineering education. The results of her research efforts have been presented in various publications including 3 books and more than 290 refereed publications. Seven of her papers have been recognized with Best Paper awards.

She is a Fellow of the American Society for Mechanical Engineers (ASME), and a senior member of the Institute of Industrial Engineers (IIE). She has served as the Chair of Design Education and Design for Manufacturing and Lifecycle Technical Committees of the Design Engineering Division of ASME. She has given several keynote talks on enhancing creativity in STEM students and sustainability in product and system engineering, and has served in the scientific committees for many conferences. Currently, she is serving on the editorial boards of the Journal of Mechanical Design, Advances in Engineering Education, International Journal of Precision Engineering and Manufacturing, and Journal of Industrial & Production Engineering.

---

Enquiry: 3442 8408

***All are Welcome!***