

## Department of Systems Engineering and Engineering Management

### Seminar Series

# The Three R's [Reliability, Robustness and Resilience] of Engineering: Some Perspectives and Synthesis

## Dr. Kailash [Kal] C. Kapur

Professor Emeritus, Department of Industrial & Systems Engineering  
University of Washington, USA

Date	27 November 2014 (Thursday)
Time	10:30am (Tea/Coffee service at 10:15am)
Venue	Room P6921, 6/F, AC1

### Abstract

The three R's refer to the foundations of a basic skills-orientated education program reading, writing and arithmetic. This seminar looks at the three R's of Engineering: reliability, robustness and resilience. There is tremendous interest these days to design and develop all types of complex systems, including infrastructure, communications, logistics and distribution systems that are not only reliable and maintainable but are also robust, resilient and sustainable. The field of reliability sometimes has been narrow in its scope and we have not always integrated the methodology with recent emphasis on broader measures of system performance. We need new measures for system performance based on reliability which are realistic and useful. Motivation for these new measures and their trends and applications are provided and their extensions and synthesis with measures of robustness and resilience is also covered. This is based on systems oriented, integrated and distributed, customer-centered multi-state system including fuzzy logic reliability and maintainability methodology. Examples and applications to infrastructure and network applications as well as health systems are developed and presented.

### About the Speaker

**Dr. Kailash [Kal] C. Kapur** is a Professor Emeritus of Industrial & Systems Engineering in the College of Engineering at the University of Washington, Seattle and presently is a Visiting Professor in the Department of Industrial

Engineering & Logistics Management, Hong Kong University of Science and Technology. He was the Director of Industrial Engineering at the University of Washington from January 1993 to September 1999. He was a Professor and the Director of the School of Industrial Engineering, University of Oklahoma from 1989-1992 and a professor in the Department of Industrial and Manufacturing Engineering at Wayne State University, Detroit, Michigan. Dr. Kapur received the Ph. D. degree in Industrial Engineering & Operations Research from the University of California, Berkeley, California. He has co-authored three books on reliability engineering and published over 100 research papers. He received the Allan Chop Technical Advancement Award from the Reliability Division and the Craig Award [twice] from the Automotive Division of American Society for Quality. He is a Fellow of American Society for Quality, a Fellow of the Institute of Industrial Engineers, and a registered professional engineer.

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***All are Welcome!***

SEEM Seminar 2014-2015/017