

Concordia Institute for Information Systems Engineering

**THE CONCORDIA INSTITUTE FOR INFORMATION SYSTEMS ENGINEERING  
IS PLEASED TO PRESENT THE FOLLOWING GUEST LECTURE IN  
OUR CIISE DISTINGUISHED SEMINAR SERIES**

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**Current developments in decision-making techniques for  
condition based maintenance**

In this presentation, the hypothesis that decision-making techniques for condition based maintenance (CBM) should depend less on statistical models and more on computer based techniques is discussed. To explain, four techniques are presented according to their chronological order of appearance: The Hidden Markov Model (HMM), the Proportional Hazards Model (PHM), Statistical Process Control (SPC), and the Logical Analysis of Data (LAD). These techniques are compared based on the following elements: the generality of the model's assumptions, the amount and quality of data needed, the procedure of parameters estimation, the introduction of cost considerations in the decision-making process, and the estimation of the proportion of erroneous decisions. To conclude, the first version of a computer program for CBM based on the LAD technique is presented.

**Biography:** Soumaya Yacout is Professor of Industrial Engineering and Operations Research in the Department of Mathematics and Industrial Engineering at École Polytechnique de Montréal in Canada. She received a D.Sc. in Operations Research from the Georges Washington University in U.S.A. in 1985, a B.Sc. in Mechanical Engineering in 1975 and a M.Sc. in Industrial Engineering in 1979 from Cairo University in Egypt. She was the recipient of the Fulbright special Peace Fellowship from 1980 to 1981. She held the position of the Dean of Engineering at the University of Moncton in 1997 and the position of the Academic Dean at École Polytechnique in 1999, both positions had never been held by a woman before. She is also the first woman to be nominated as Dean of Engineering for a French speaking university in Canada. From 2001 to 2004 she acted as member of the Higher Education and Research Committee of the Superior Council of Education of Québec. Since 1995 she has been member of visiting teams for the accreditation of engineering programs by the Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers, and in 2010, she has been appointed as member of the Strategic Projects Selection Panel for Competitive Manufacturing and Value-Added Products and Processes. She had been the recipient of the Natural Science and Engineering Research grants since 1991. She designed and taught courses on quality engineering, reliability and maintenance for undergraduate, graduate, and professional engineers in Canada and internationally. She supervised more than 40 masters and doctoral students. She has more than 60 publications in journals including Quality Engineering, International Journal of Production Researches, Computers and Industrial engineering, IEEE Transactions, and more than 40 papers presented in international conferences, some of which received the best paper award. She is the co-editor and the co-author of a book on minimal repair, the invited editor of the special issue on Condition based Maintenance of the Journal of Intelligent Manufacturing, and also the invited co-author of the book: Current Themes in Engineering Technologies. She has been an invited speaker at the University of Toronto and the University of Windsor. She is a senior member of the American Society for Quality, and a member of the Institute of Industrial Engineering, and the Canadian Operational

**Thursday, January 13, 2011**

**16:00**

