Department of Industrial, Systems, and Manufacturing Engineering
Seminar Presentation

Mr. Parsa Kianpour
PhD student, Department of Industrial, Systems, and Manufacturing Engineering, Wichita State University

Title: Optimization Methods for Tardiness/Earliness Scheduling Problem In Deterministic And Uncertain Job Shop Environment

Date: Friday – February 8, 2019

Time: 11:00 am – 12:00 noon

Location: Engineering Building (EB) Room 211

Abstract

Motivated by the practical scheduling problem of job shops, this research aims to evaluate unrelated parallel machine scheduling problem with the objective of minimizing tardiness and earliness cost in both deterministic and uncertain flexible job shop environments. This study proposes a new model considering effects of maximum allowable tardiness. It compares the total cost provided by the proposed model with the case in which there is no limitation on tardiness. In addition, the existing model in the literature is simplified to reduce computational time and enable corporate scheduling staff to use the model efficiently. The model is validated using data collected from a local job shop that manufactures aerospace parts. The results show the effectiveness of proposed model since it reduces the total cost and computational time in most of the studied scenarios. To account for real-life cases representing uncertainty, in the second step of the research, input parameters are considered uncertain. Robust optimization method is used to deal with uncertainty. The robust counterpart formulation is provided to solve the optimization problem with uncertainty and bring the tradeoff between optimality and robustness. The factorial design has been implemented to evaluate the effect of each factor on the result of scheduling problem.

Speaker Biography

Parsa Kianpour obtained his BA and MA in Industrial Engineering and Supply Chain Management at Qazvin University, Qazvin, Iran and Coventry University, Coventry, United Kingdom. He works as a Continuous Improvement Specialist at the local aerospace company, Wichita, Kansas. He is currently in his fourth year of his PhD in Industrial Engineering at Wichita State University, department of Industrial, Systems and Manufacturing Engineering (ISME). His research interests center around operations research in scheduling problem at job shop environment. His current research is minimizing the earliness and tardiness costs in both deterministic and uncertain environments using multiple optimization methods. He also serves as a lead student to implement energy saving assessments provided by DOE Industrial Assessment Centers (IACs) located in Wichita State University as a part of Midwest team at University of Missouri-Columbia.