Nurse staffing levels are not only important for resource planning, but also for quality of care, patient outcomes, nurses’ well-being and job satisfaction. Nurse scheduling decisions specify the assignment of work shifts to nurses over a planning period, while respecting organizational policies and staff-related constraints. Nurse scheduling in the neonatal intensive care unit (NICU) is particularly challenging due to complexity of nursing resource needs. NICU stays require high levels of nursing resources which may be uncertain by the time of making the scheduling decisions. Further, the NICU nursing skill set is very selective which limits the ability to utilize nurses from other units (e.g., maternal/pediatrics). Currently, the Christiana Care Health System’s (CCHS) NICU nurse scheduling process consists of manual and time-consuming tasks. The objective of this study is to present a scheduling model that can readily be used to guide nurse staffing decisions. We present a multi-objective approach to incorporate multiple goals in the nurse schedule to be achieved. The scheduling model minimizes undesired deviation variables of the model goals while satisfying organizational policies, workload fairness-, and nurse healthiness-related constraints provided by the CCHS’s NICU medical and nursing staff.

Refreshments will be served in Daniels Hall room 428
from 11:00 a.m. to 11:30 a.m.
Muge Capan, PhD
Value Institute, Christiana Care Health System
John H. Ammon Medical Education Center

Biography

Dr. Capan is a Research Investigator at the Health Care Delivery Science Department, Value Institute, Christiana Care Health System. Her research interests include stochastic processes, decision analysis, and mathematical modeling with applications to medical decision making and optimization of health care systems. She received her Ph.D. in Industrial and Systems Engineering from North Carolina State University and has worked as a research assistant and as an instructor for undergraduate level courses at the ISE department. Her dissertation research has incorporated statistical analysis and decision analytical modeling within adult patients using large-scale electronic medical records.

Her current research projects include forecasting hospital unit-based census, staff scheduling, as well as development and implementation of early warning score-based clinical decision support systems. In addition to several conference presentations and proceedings, she has recently published in Resuscitation in a collaborative effort with Mayo Clinic on optimal patient-centered response to acute physiological deterioration. Dr. Capan is an invited session chair for INFORMS 2015, an invited speaker for INFORMS Healthcare Conference 2015, a referee for IIE Transactions, and leader of the Operations Research Interest Group at Society of Medical Decision Making.