

**NORTH CAROLINA STATE UNIVERSITY  
OPERATIONS RESEARCH**

**OR/IE 601/801**

**Tues., January 29, 2008  
218 Daniels Hall  
4:30 pm**

**A Model for the Adaptive Preventive Maintenance System  
in a Multi-skilled Workforce Environment**

**Bahram Alidaee  
School of Business Administration  
The University of Mississippi  
University, MS 38677  
[balidaee@bus.olemiss.edu](mailto:balidaee@bus.olemiss.edu)**

**Abstract**

Manufacturing and service flexibility can be a major competitive advantage in firms as well as well designed supply chains. One way to address such flexibility is through workforce agility that can be created via cross-training. This talk is concern with cross-training of workforce. We will present a new integer programming (IP) formulation of the problem. The presented model is a generalization of multiple resource generalized assignment problem (GMRGAP). The IP formulation can be applied in a variety of settings where a subset from a larger set is to be selected for assignments, in that, if an object is selected for assignment then several related objects also must be selected for assignments. Graph theoretic formulation of special cases will be presented. Extension of the formulations to variety of settings including preventive management, unmanned aerial vehicles, target assignment problem, multiple vehicle routing, multiple project management, and optimal redundancy allocation for information technology disaster recovery will be presented. Extension and a two-stage model for policy analysis in development of multi-skilled human resources will be presented. Finally, computational experiment using CPLEX and heuristics will be presented.

**Refreshments will be served in 401 Daniels Hall at 4:00 pm**