Abstract:
Practically all organizations achieve their objectives by building a portfolio of activities subject to budgetary restrictions and other constraints. Such decision problems involve decision makers facing alternative courses of action, which, if selected, consume resources and lead to multi-dimensional consequences. Research in the area of “Portfolio Decision Analysis (PDA)” strives to bring greater rationality and transparency to such resource allocation decisions. In the past thirty years a vast number of publications have proposed different mathematical programming models for PDA problems, considering specific (real-life) decision environments. In order to support organizations in selecting suitable PDA methodologies, the Chair of Operations Management is developing a categorization framework for PDA decision problems and their mathematical formulations. This thesis shall summarize and categorize mathematical modeling approaches for uncertainty and typically considered side constraints of portfolio problems shall be identified, formally defined and structured. This problem formulation framework shall be applied to a database of PDA literature, provided by the chair, in order to investigate the suitability of PDA methodologies for different uncertainty environments.