
MIE463 – Integrated Systems Design, Fall, Classes are Room SF1105 on Monday 10AM - Noon (Optional Tutorial Class – As Needed). Course start date 11th September

Course Description:

Integrated System Design is a capstone course that integrates the various perspectives of an integrated system taught in the third year, including: Optimization, Quality, Management, Information, and Economics. The course approaches integrated systems design from a Business Process Management (BPM) perspective. Beginning with the Business Processes, it explores the concept of developing an Integrated Enterprise, via Business Process Design at an Enterprise level. We apply systems thinking to Strategy, Value Chains and Processes, Metrics and Design Heuristics. In the second half of the course, the concept of business process design is extended to incorporate Industrial Engineering perspectives such as cost, productivity, quality, and organization behaviour. BPMN (Business Process Modeling Notation) is used to document business processes. Our perspective is based on past research and hands on practice in applying business process management methods to a variety of enterprises across many sectors.

Modules

Part 1 – Introduction to Integrated Systems Design

Week 1- Mod 0 – Orientation and Course Overview

- Overview of the entire course - how we will cover course content in breadth and depth
- Course Value in Career Planning
- Mechanics of the Course including:
 - BPM Thinking, Design, BPR, History, Integrated Enterprise
 - Project team formation and operation
 - Course Book - Assignment Planning and Requirements
 - Grading structure (Critical Reviews, Book Review, Discussions, Projects)
 - Web site layout and operation, Important Dates
 - Purpose of Primers and Academic papers
 - Critical Thinking and Performance Rubric

Week 1 -Mod 1 – Introduction to ISD – Business Process Management

- BPM Architecture and Integrated Enterprise
- BPM linked to Strategy?
- BPM - Value Chains?
- BPM - Linking Strategy to Action?
- How do we achieve an integrated systems approach via Business Process Management?
- Case Study

Part 2 – Integrated Enterprise Methodology

Week 2- Mod 2 - Enterprise Methodology and Strategic Direction

- Integrated Enterprise Modeling
- Voice of the Customer
- Customer Process output
- Comparing Value to Cost (Customer and Company)
- Case Study

Week 3 Mod 3 –Performance Measurements

- Business Process Metrics
- Supply Chain (SCOR) Framework Metrics
- Business Process Performance Management
- Reflection & Practices
- Case Study

Part 3 Business Process Analysis

Week 4 -Mod 4 - BPM Organizational Approach

- Establishing Process Improvement Teams – Mission Goals and Charters
- PIT Work plans
- Team and Project Communications
- PIT - Early Wins to Build Support and Momentum
- Reflection & Practices
- Case Study

Week 5 - Mod 5–Business Process Analysis Methodology

- Business Process Analysis (BPA) Approach and Method
- BPA Problem Analysis
- BPA Problem Types – Workflow and Control Issues
- Reflection & Practices
- Case Study

Week 6- Mod 6 – BPM, TQM, and Six Sigma

- General Problem Solving Approach and Tools
- Relationship of BPA with Six Sigma
- BPA and Lean Six Sigma –DMAIC
- BPM v Six Sigma v Lean
- Reflection & Practices
- Case Study

Part 4 Business Process Improvement

Week 7 - Mod 7 – Business Process Design, and Visioning

- BPR Approach
- Developing a Process Vision
- Reflection & Practices
- Case Study

Week 8 - Mod 8 - Value Engineering and Optimization (Time Cost)

- Business Process Activity Time and Cost-Process Time v Cycle Time
- Business Process Cost Analysis – Cost of Quality
- Value Added Versus Non Value Added
- Reflection & Practices
- Case Study

Week 9- Mod 9 - Lean Enterprise Thinking

- Lean Thinking and Principles – Sources of Waste
- Lean Activity Analysis
- Lean Aerospace Enterprise Initiative
- Lean Case Study
- Reflection & Practices

Week 10- Mod 10 - Role of IT in Business Process Design

- Fundamental Impact of IT on Business Processes
- Efficiency and Productivity Impact
- Knowledge Management Systems
- Integrating Process Management with IT Software Functionality
- Reflection & Practices
- Case Study

Part 5 Transforming and Sustaining The Lean Enterprise

Week 11 - Mod 11 - Managing Innovation and Organizational Change

- Principles of Organizational Change – Business Psychology
- Managing the impact of org change on the employee
- Reflection & Practices
- Case Study

Week 12- Mod 12 - Transforming the Enterprise (TTE)

- Approach to Enterprise Wide Transformation
- Socio-Political Management
- Governance and Cascading Communications
- Waves of Change
- Reflection & Practices
- Case Study

**Week 11-12 - Mod 13 – Student Team Project PPT Presentations (Class will
be split)**