IEOR E4111
Operations Consulting

Prof. Soulhaymane Kachani

Fall 2016 – Spring 2017
Syllabus

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Syllabus

– **Course Schedule:**
  - **Thursdays 7pm-9:30pm or later**
  - **501 NWC**

– **Courseworks**
Syllabus

– **Course Texts:**

2. *Flawless Consulting 2nd Edition*, Peter Block, Pfeiffer
Course Texts:

5. *Say It With Presentations, (Revised and expanded)* Gene Zelazny, McGraw Hill


7. *The World is Flat: A Brief History of the Twenty-first Century, 2006* and *Hot, Flat, and Crowded: Why We Need a Green Revolution--and How It Can Renew America, 2008*, both by Thomas L. Friedman

8. Compilations of papers
This course aims to develop and harness the modeling, analytical and managerial skills of engineering students and apply them to improve the operations of both service and manufacturing firms.

The course is structured as a hands-on laboratory in which students “learn by doing” on real-world consulting projects. The student teams will focus on identifying, modeling and testing (and sometimes implementing) operational improvements and innovations with high potential to enhance the profitability and/or achieve sustainable competitive advantage for their sponsor companies.
Course Description

- The course is targeted toward students planning careers in technical consulting (including operations consulting) and management consulting, or pursuing positions as business analysts in operations, logistics, supply chain and revenue management functions, positions in general management and future entrepreneurs.

- Prerequisites/Corequisites: Probability and Statistics at the level of SIEO W3600 or SIEO W4150, and Deterministic Models at the level of IEOR E3608 or IEOR E4004.
Instructor & TA Information

– Instructor: Prof. Soulaymane Kachani
  • Office Address: Mudd Building Room 346
  • Telephone Number: (212) 854-1804
  • E-mail: kachani@columbia.edu
  • Office Hours: Thursdays 5 to 7pm + by appointment

– Teaching & course assistants:
  Antoine Desir ad2918@columbia.edu (head TA) and additional TAs & CAs (TBD)
  • Academic background
  • Office Hours: TBD
Method of Evaluation

– Class participation
– Online modules
– Individual and group assignments
– Individual presentations
– Group presentations (in waves)
– Group reports

All assignments, presentations and reports are subject to the usual standards of academic honesty as described in the University's Student Handbook.
Topics Covered in the Course

I. Consulting skills
II. Modeling skills and quantitative techniques
III. Operations management knowledge

Challenge: How to marry all 3?
Topics Covered in the Course

I. Consulting skills:
   – Case interviews + frameworks: 3Cs, 4Ps, 5Fs, 5Ms, 7Ss, STP, SWOT and Value Chain
   – Problem definition and hypothesis driven diagnosis
   – Managing client relationships
   – Project planning and lifecycle management
   – Leadership, teamwork and group dynamics
   – Communication: Presentations and report writing
Topics Covered in the Course

II. Modeling skills and quantitative techniques:

– Modeling skills:

• Airline Schedule Planning
  – Airline operations planning - Role of OR
  – Schedule design
  – Fleet assignment problem
  – Maintenance routing
  – Crew scheduling
  – Integrated models
II. Modeling skills and quantitative techniques:

- Modeling skills:
  - Revenue Management in the Service Industry
    - Overview of the field of revenue management
    - Static single-leg problem
    - Static network problem and bid-price control
    - Dynamic single-leg and network problems
    - Extensions
II. Modeling skills and quantitative techniques:

– Modeling skills:

• Dynamic Pricing in Logistical Systems
  – Practice of dynamic pricing
  – Case study: Pricing under competition: myopic and multi-period pricing
  – Case study: Application of dynamic pricing to gasoline retail
  – Case study: Application of dynamic pricing to a supplier-retailer relationship
II. Modeling skills and quantitative techniques:

– Quantitative techniques:
  • Forecasting
  • Statistical Process Control
  • Capacity Planning
  • Decision Analysis
  • Linear, nonlinear and integer programming
  • Transportation Models
  • Queuing Models
  • Learning Curves
  • Simulation
Topics Covered in the Course

III. Operations management knowledge:
– Operations and Productivity
– Operations in a Global Environment
– Micro and macro perspectives
– Project Management
– 10 critical operational decisions
Online Modules

- **DRIVING STRATEGIC IMPACT: MASTERING THE SKILLS OF STRATEGY CONSULTING**

- *Driving Strategic Impact* is a set of online modules that provide a rigorous introduction to the tools, frameworks and best practices in strategy consulting. Over the years, top-tier strategy consulting firms have developed a unique set of skills that consistently help them deliver practical solutions to complex strategic issues. These modules provide the opportunity to acquire this skillset to become more effective at addressing strategic issues and having greater impact within an organization and with clients.
Online Modules

- The modules are organized around the four phases of a strategy project:
  1) Defining the scope
  2) Structuring the problem
  3) Gathering and analyzing data
  4) Developing recommendations

- This problem-solving methodology is supplemented by additional training on communication, managing strategy projects, and influencing others. Students get to learn and practice specific consulting tools and principles associated with these topics, such as issue trees, hypothesis-driven problem solving, interview guides, triangulation, the pyramid principle and storylines. Formal discussion of consulting tools and skills is supplemented by consulting cases based on real-life engagements.