Course syllabus: Summer 2013

MGB 206: Decision Making and Management Science

Instructor: Sanjay Saigal

Class schedule: Saturdays, 9 am-noon, and 1-4 pm – 6/29, 7/13, 7/27, 8/10, 8/24

Final exam: Take home, open book (due by 8/30)

Office hours: 1 pm on Fridays before class, 4 pm on class days and Skype by pre-arrangement.

Description

The profitability, even survival, of organizations increasingly depends on responding to market dynamics. Fundraisers slice and dice donor lists to optimize each mailing’s ROI, just like a catalog retailer. Manufacturers rely on real-time data to optimize pricing, inventory, fulfillment, and practically every other function. Online behemoths such as Google create revenue models from algorithmic ‘secret sauces’. Post-Moneyball, even the business of sports is enthralled by analytic decision-making. This stuff is everywhere!

Analytic decision-making has multiple aspects. Business intelligence helps identify what’s happening now. Forecasting and predictive analytics anticipate what will happen. Management science, our focus, goes further: it helps determine the optimal response based on today’s reality and tomorrow’s forecast.

Management science is sometimes regarded as a technical specialty. Indeed, it is often taught with a formal emphasis. But this is no theory course. The techniques we cover are used every day by executives and analysts to address critical business issues across applications, sectors, and geographies.

With that in mind, expect to learn as much (perhaps more) through active problem-solving, classroom discussion, the occasional guest practitioner and pre-class reading, as by passive listening.

MGB 206 will prepare you to:

1. Recognize actual decision opportunities amenable to management science solutions
2. Test your approach by yourself, on your laptop
3. Communicate the value of your approach to stakeholders and colleagues

Is this course for you?

<table>
<thead>
<tr>
<th>You’ll probably get a lot out of it if you</th>
<th>The class may not be a good fit if you</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lean towards making evidence/data based decisions</td>
<td>Rely primarily on qualitative analysis or intuition</td>
</tr>
<tr>
<td>Feel disciplined practice fuels business success</td>
<td>Feel inspired leadership fuels business success</td>
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<tr>
<td>Choose your classes based on their applicability</td>
<td>Like nothing better than elegant theory</td>
</tr>
<tr>
<td>Anticipate the 2-5 hrs of homework per session</td>
<td>Don’t have much time to devote to homework</td>
</tr>
<tr>
<td>Read material before class to make classroom time more productive</td>
<td>Have difficulty finding the time to read course material before class</td>
</tr>
<tr>
<td>Find in-class discussion with peers useful &amp; enjoyable</td>
<td>Prefer listening mainly to your pros</td>
</tr>
<tr>
<td>Are proud of your facility with Microsoft Excel</td>
<td>Not comfortable with Excel</td>
</tr>
<tr>
<td>Idolize Nate Silver</td>
<td>Are thinking to yourself – Nate Silver who?</td>
</tr>
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Text

We’ll cover (almost all of) chapters 1-4 and 6-8 of our primary classroom text:


Other supplemental readings will be available on Smartsite.
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Topics

<table>
<thead>
<tr>
<th>Day</th>
<th>Morning session (9-noon)</th>
<th>Afternoon session (1-4)</th>
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</thead>
<tbody>
<tr>
<td>6/29</td>
<td>Decision-making models (ch 1)</td>
<td>Monte Carlo simulation (ch 2-3)</td>
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<tr>
<td>7/13</td>
<td>Monte Carlo simulation (cont’d)</td>
<td>Linear optimization (ch 7)</td>
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<tr>
<td>7/27</td>
<td>Integer &amp; nonlinear optimization (ch 8)</td>
<td>Optimization (cont’d)</td>
</tr>
<tr>
<td>8/10</td>
<td>Decision trees (ch 7)</td>
<td>Queuing (ch 4)</td>
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<tr>
<td>8/24</td>
<td>Class project</td>
<td>Implementing analytics</td>
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Prerequisites

The most critical course prerequisite is facility with Microsoft Excel. You should be able to copy, cut and paste, and use formulas, ranges and graphs. No programming experience required.

Risk Solver add-in

Since Microsoft Excel is the ubiquitous tool for business analysis, we’ll use it as our analytic sandbox. We’ll also use an Excel add-in called Risk Solver Platform for Education from Frontline Systems, the company that created the built-in Solver in Excel. If you use an Apple laptop for your class work, it’ll need to run Windows and Excel under Windows. There is no workaround for this. You must run Windows!

Class project

Three-person project teams will identify, address and present a value-add opportunity using analytic decision-making. An informal proposal will be submitted by 8/2. The presentation will be on 8/24.

Grading scheme

- Class participation: 25%
- Homework assignments: 25%
- Project (proposal and presentation): 25%
- Final exam: 25%

Homework

Assignments will be handed out the evening of each Saturday session. Completed assignments should be uploaded to Smartsite by midnight (PT) of the following Saturday.

Assignments will be eligible for partial credit as follows: A day’s delay will incur a 30% penalty, two days 40%, and three days 50%. Four days or more, no credit.

Due to our tight course schedule, I will grant no exceptions.

Absence

Given that we have only five sessions to cover our ambitious syllabus, missing a day means missing 20%. If you know you can’t make one or more sessions before you register, it’s better to skip the course this time around.

If, once the quarter begins, you believe you absolutely positively have to miss a day (or part-day), let’s discuss before you go AWOL so we have time to figure out a make-up strategy.

Examinations

The final written exam will be take-home, covering all class topics. It will be due by 8/30.