Scheller College of Business
Georgia Institute of Technology

Spring 2014

MGT 4803: Revenue Analytics

Sessions: Monday/Wednesday, 3:05 – 4:25 pm

Location: Scheller College of Business, Room 203

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Course Outline:

Revenue management is a powerful new discipline that enables companies to understand the complexities of today's diverse marketplace and allows managers to make rapid and confident decisions with the aim of maximizing profitability. It is the science of selling the right product or service to the right customer at the right time for the right price. In "Revenue Analytics", we will explore both model and data driven price decisions for maximizing a firm's profit. The course will be a nice fit for someone who is planning to pursue a career in a recently growing business area, "Business Analytics", with a variety of data driven statistical decision tools introduced throughout the semester.

In this course, spreadsheet-based modeling methods and advance analytics will play a distinct role in getting students familiar with handling massive amounts of customer data and learn how to analyze this data to come up with the best pricing decision. The first component of the course is designed to provide different forecast techniques to predict the customer preferences based on past sales data. The next component involves introduction of pricing in a general sense with also specific marketing implications such as market segmentation, product versioning, and customized pricing. Finally, the primary component involves the aforementioned rapidly growing discipline, capacity based Revenue Management. In this part of the course, students learn to characterize different revenue problems and identify the best statistical and/or mathematical optimization technique to set and update prices in order to maximize the profit.

The examples may include, but are not limited to, deciding on the booking limits for seats sold at different prices, or deciding on timing of the next discount for the item in the store, or how many reservations to overbook for a particular type of room in a hotel. We will make extensive modeling using MS Excel and explore different price strategies.

Course Objectives:

- Build an understanding of how Revenue Management fits into the organization.
- Build both quantitative and qualitative skills to identify revenue opportunities in different business contexts.
- Provide common sense revenue analytics concepts, which can be used to evaluate various problems that arise in practice.
- Provide hands-on training through MS Excel on making data driven pricing and capacity based revenue management decisions.

Course Materials:

Required text: *Pricing and Revenue Optimization*, 1st Edition, by Robert L. Phillips, 2005, Stanford: Stanford University Press.

Supplemental Material:

- *Data Analysis and Decision Making*, 4th Edition, by S. Christian Albright, Wayne Winston, and Christopher Zappe, 2010, Mason: Cengage Learning.
- *Revenue Management: Hard-Core Tactics for Market Domination*, by Robert G. Cross, 1997, NY: Broadway Books.

T-square: The following class materials are posted on T-Square: lecture slides, homeworks, assignments, and supplementary articles.

Prerequisite:

MGT 2251 – Introduction to Management Science

Grading Policy:

Grading for the course will be based upon the following components weighted by the given percentages:

Homeworks:	25%
Forecasting Assignment:	20%
Capacity-Based Revenue Analytics Assignment:	20%
Pricing Analytics Assignment:	20%
Revenue Management Project (Show time):	10%
Class Participation:	5%

The weights will determine whether a student performs effectively along each main subject of the course. Final course letter grades are determined using the total points accumulated from all stated dimensions.

Homeworks:

The homeworks may be due before or after the material is covered in the class, in which case the student is expected to take the homework solutions as far as they can. A student may work on a homework individually or in a **team of up to 3 people**. When working on a homework as a team, only one solution need to be turned in with all students' names on the assignment. Please don't forget to put all names on the deliverable file when it is turned in. Deliverable file should be sent to me by email at least two hours before class, with cc to (TA's email). The deliverable file should be named using your group members' last names in alphabetical order + HW + homework number (Example: Jacobs-Fader-Smith-HW1.xlsx).

Assignments:

All assignments are group based. A student should work with a group of up to three to five people. The purpose of the projects is for you to explore application of the dynamic pricing and revenue management techniques learned in class to data. Your group will turn in a single deliverable excel file that will show your approach and provide your response to the problems stated in the project. Please don't forget to put all three names on the deliverable file when it is turned in. The deliverable file should be sent to me by email at least two hours before class, with cc to (TA's email). The deliverable file should be named using your group members' last names in alphabetical order + P + project number (Example: Jacobs-Fader-Smith-P1.xlsx).

Revenue Management Project:

The purpose for the Revenue Management Project is for your group to explore how dynamic pricing and revenue management techniques learned in class can be applied to real business data. A student should work with a group of up to three to five people. You will not receive questions to give you a direction on how to approach the data. There will be no restrictions on what you can do with the given data as well. You will construct your own deliverable based on your selection of dynamic pricing and revenue management techniques you choose for your analysis. A brief presentation of each group to the class is scheduled for the last two (tentative) sessions. The project reports are due before 5 pm on the previous day of the first presentation session.

Class Participation & Policy:

This is a purely qualitative measure of your effective contribution to class discussions. Sessions involve a mix of lectures, presentation of applications on excel and discussion of pre-assigned readings in class. You are expected to do the pre-assigned readings, and prepared to discuss them in class. It will be to your advantage to be alert, original and contextual during discussion.

It is important to have a classroom environment that supports learning for everyone. This requires some basic rules of respectful behavior to be followed. Please do not talk to your neighbors, or do not read anything other than the class material currently being discussed, and please turn off your cell phones. Please keep your big print name cards up throughout the class.

Academic Integrity:

Homeworks and projects are expected to be the sole effort of the student (or group for group projects and homeworks) submitting the work. Students are expected to follow the Georgia Tech Academic Honor Code (available at http://www.honor.gatech.edu). The honor code applies to homeworks and projects. I take the Honor Code very seriously. If I suspect a violation, here is the process I will follow, called the Faculty Resolution option, per Georgia Tech guidelines:

I will discuss the matter with the student(s) involved. One of three outcomes can occur.

1. Student does not take responsibility, no suspicion remains → end of story
2. Student does not take responsibility, but suspicion remains → refer to Dean of Students
3. Student takes responsibility → Recommend a sanction consisting of change in disciplinary standing (reprimand, warning, probation, suspension or expulsion) and a grade impact and inform Dean of Students. This is called the faculty resolution. In this case, the student will be formally notified of the proposed faculty resolution by e-mail to their Georgia Tech e-mail account. The student may request to have the allegations reviewed by a hearing panel. If the student does not make this request within six (6) working days after the date the e-mail notification of the resolution is sent, the resolution will be implemented and considered notice of a final disciplinary action with no right to appeal. If the student accepts responsibility for a violation and has a prior disciplinary history or the Faculty Resolution recommends suspension or expulsion, the matter will be referred to the Honor Committee (HC) for sanctioning. The HC will seriously consider the Faculty Resolution grade impact recommendations. The student may specifically waive their right to go before a hearing panel and accept an administrative resolution proposed by the Office of Student Integrity. If the student accepts the administrative resolution, the decision goes into effect immediately with no right of appeal.

ADAPTS:

If you need an accommodation regarding your disability in the class, please follow the guidelines provided by Georgia Tech's ADAPTS-Disability Services. As per the instructions, it is your responsibility to bring me the faculty accommodation form to notify me about your needs in the class. The guideline is available at http://www.adapts.gatech.edu .

Tentative Schedule:

The following schedule is tentative. In general, even if the specific date of coverage may change slightly, the order of coverage should remain as presented below. Modifications may be made as the semester progresses and the appropriate changes will be announced in class.

Week	Date	Topic	Activities
1	6-Jan	Class Outline	
	8-Jan	Introduction Revenue Management & Pricing	
2	13-Jan	The Core Concepts of Revenue Management	
	15-Jan	Introduction to Forecasting	
3	20-Jan	Official School Holiday	
	22-Jan	Forecasting with Trend and Seasonality	
4	27-Jan	Measuring Forecast Accuracy	
	29-Jan	Forecasting Price Changes and Promotions	
5	3-Feb	Forecasting Project Presentation	
	5-Feb	Price Response Function, Price Elasticity, WTP Distributions, Price Optimization	Phillips – Chapter 3
6	10-Feb	Pricing with Constrained Supply, Peak Load Pricing and Applications	Phillips – Chapter 5
	12-Feb	Markdown Pricing	Phillips – Chapter 10
7	17-Feb	Markdown Pricing	Phillips – Chapter 10
	19-Feb	Price Differentiation, Market Segmentation	Phillips – Chapter 4
8	24-Feb	Product Versioning, Customized Pricing	Phillips – Chapter 4
	26-Feb	Guest Speaker - proRize	
9	3-Mar	Price Analytics Assignment Presentations	
	5-Mar	Capacity Control & Revenue Management	Phillips – Chapter 6
10	10-Mar	The Newsvendor Model, Opportunity Costs, Optimal Overbooking	Phillips – Chapter 9
	12-Mar	Booking Limits: EMSR and Bid-price models	Phillips – Chapter 7
11	17-Mar	Spring Break	
	19-Mar		
12	24-Mar	Network Revenue Management	Phillips – Chapter 8
	26-Mar	Greedy Heuristic and LP Approach	Phillips – Chapter 8
13	31-Mar	Guest Speaker – TBA	
	2-Apr	Capacity based Revenue Management Assignment Presentations	
14	7-Apr	Behavioral Issues in Revenue Management	
	9-Apr	Guest Speaker – TBA	
15	14-Apr	Unconstraining of Demand Data	Reading: "Starting with Good Inputs: Unconstraining Demand Data in Revenue Management" by Mark Ferguson and Carrie Queenan
	16-Apr	Project Presentations	
16	21-Apr	Project Presentations	
	23-Apr	Guest Speaker - Robert G. Cross, CEO of Revenue Analytics	