RUTGERS

Operations Analysis
Summer 2014

Professor:	Myles D. Garvey
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Office Hours:	Before and after class, or by appointment
Classroom:	1 WP , Rm. 512
Time:	W, 6:00-9:30 P.M.
Course Web Page:	blackboard.rutgers.edu

Textbook:

Primary (POA)
Production and Operations Analysis (4e,5e, 6e Notes and questions will be based on 4e.). Steven Nahmias, McGraw-Hill, 2009
ISBN-10: 0-07-337785-6/ISBN-13: 978-0-07-337785-8

Supplements:
(LN):
Lecture notes and chapter Outlines from <***Managing Supply Chain Operations***>,
by Professors L. Lei, R. Oppenheim, Y. Zhao, and Len DeCandia, Rutgers University
(HL):
Introduction to Operations Research
Frederick Hillier, Gerald J. Lieberman, McGraw-Hill, 2009, 9th-Edition. ISBN-10: 0077298349 / ISBN-13:9780077298340

Course Description:
    This course covers fundamentals of operational analysis for various performance issues encountered in real life business processes. The major topics include demand forecasting and demand management strategies, sales and operations planning (S&OP), inventory planning models and deployment, uncertainty and safety stock management, supply chain collaborative planning, business capacity planning, and fundamentals of project management. Case studies on analyzing and designing cost-effective solutions for improving a company's operational efficiency and profit margin are used. The objective is to help our students to develop a strong knowledge of analytical thinking skills and supply chain strategies toward operational excellence in a highly dynamic and competitive business environment.

Course Format:
The course will consist of a combination of lectures, class discussion, case studies and videos. The lecture/discussion component will be devoted to presentation and discussion of theories, concepts and analytical techniques. Several videos and case studies may also be used in lectures

to connect the theory to real-world application. Students are expected to take notes during videos and engage in discussion after. Sessions are accompanied by assigned reading materials from the text (see the schedule below).

The text serves as background information for lecture and casework. Students are **expected to read** the corresponding chapter **before** each class. Only POA is required for this course. However, any other assigned readings will be photocopied and posted on blackboard. I do recommend, however, that you acquire HL. While this text is VERY analytical, it offers insightful examples and can certainly be used as a reference for the future.

Students will be assigned a case study EVERY OTHER WEEK. Each case study is due two weeks after the assigned date. Everything, with the exception of exams, will be digital through blackboard. No hard-copies are accepted. In addition, there will be one class project split into two parts. See below for more detail.

Policies:

- Please adhere to professional behavior in class. Refrain from chatting, reading the newspaper, answering phones, wearing headsets etc. Such behavior is disruptive and discourteous and WILL result in you being thrown out for the remaining time of the class. I cannot be more clear on this. If this is a continued pattern, this will result in you receiving an F for the course.
- Please do not call the SCM and Marketing Sciences Department about grades and other course information. The secretaries in the Department will not have this kind of information.
- Important announcements will be made in class and posted on course web page. So please make sure you are receiving emails from blackboard!
- Final course grades are final. Let me repeat this. Final course grades are final! Changes will only be made if there is a mistake in the calculation of the final grade, but legitimate evidence suggesting the contrary must be presented to the professor. Legitimate constitutes the use of the professor's calculation in grade mismatching with the grade received. See below for more detail. It does NOT include a mistake made on a particular assignment or exam or project.
- Accommodating students with special learning needs: In accordance with the university policy, students with documented sensory and/or other learning disabilities should inform the professor, so that their special needs may be accommodated. Please let me know IMMEDIATELY following the first lecture.
- As you may know, it is against university policy to cheat. It is a very serious violation of academic integrity. I am here to help you, but I cannot do so if you are not putting effort into your work. Please note that if cheating of any kind is observed in/out of the class, you will be reported to a higher authority in accordance with university policy on academic dishonesty. Cheating includes working in groups on individual projects/assignments, copying off other exams, breaking outlined policies for exams or projects, etc.
- If you feel I have made a mistake grading an assignment or exam, please inform me and we can set up a meeting to discuss it. The general procedure for this is to first email me

with your concern and the exact reason as to why I have made a mistake. I will then review your assignment or exam and determine if a mistake has been made. If none has, then that is the end of the line and your grade will remain the same. If it is determined that a mistake was made, I will adjust it. Please note, that mistakes I may have made on assignments and exams MUST be brought to my attention at MOST one week after return. After that one week, your grade CANNOT be attested and will remain as is.

- I have set up an email account through Google specifically for this course. Any emails directed to me to any other email other than the one listed on this syllabus WILL be ignored. I get hundreds of emails a day, and as such, I have a tendency to ignore many of them. However, if you contact me through this email, you will receive a response in less than 12 hours.

- My phone number is here for EMERGENCIES ONLY. Emergencies include not being able to make a class when it is your turn to present material or on any of the exams. I do not wish to receive text messages or phone calls pertaining to course material, assignments or project clarifications. These are low priority items that are suited for emails. I am not held responsible if you decide to start working on something when the due date is the day or two before. If you contact me via phone for any other reason than the ones specified in this paragraph, you will have 10 points deducted from your final grade.

- I intend to video tape our in class lectures and plan to post them on blackboard so you can reference them later. If you have a problem with this, please let me know and we can work something out.

- Along with the Google account I have set up a calendar for your class meeting times and assignment / project due dates. Be sure to either put the file in your phone or to keep track of the calendar. I am NOT responsible for changes in your version of this calendar, although I will update the live version as necessary.

- This course is part analytical and part business practical. Given that you are MBA students, I have full faith you are great with the general business concepts and theory. However, I am not familiar with your individual mathematics backgrounds. As such, a brief evaluation will be given on the first day of class to test your strengths/weaknesses. This is NOT part of your grade other than a simple participation point for your final grade. Do your best. This is simply to test what you know, so don't fret over it. If you wish to get a head start to save me some review time, I advise that you read up on your Algebra, Probability and basic Calculus (Only basic Derivatives and Integrals, nothing too complicated).

- Have fun! While I sound very strict, I'm really not. I expect to bequeath onto you a wonderful set of skills that will help you in your future endeavors. As you may know, many corporations are moving in the direction of analytics, and if you are able to master this skill-set, you are a great addition to the future workforce that will make your mobility much faster than your competitors. I will try to guide you through the math, but understanding the basic problems, how to solve them and how they pertain to a business's overall strategy is the important part. As such, I cannot do all your work for you. Just like a math course, learning is best accomplished by DOING. So make sure you work on a few problems outside of what I assign you to be able to master the concepts. Remember, I am here for you. I have an open-door email policy. Email me whenever you have a question, no matter how basic it may seem to you.

Evaluation:

Work	Percent
Case Studies (4 of them, % each)	5% (20% Total)
Midterm Exam	25%
Final Exam	25%
Project	20%
Attendance	5%
Participation	5%
Total	100

Grade Calculation
Final Grade
=05*(CaseStudy1)+.05*(CaseStudy2)+.05*(CaseStudy3)+.05*(CaseStudy4)+.25*(MidtermExam)+.25*(FinalExam)+0.2*(Project)+.05*(#ofClassesAttended/8)*100   + .05*(#ofClassesParticipated/8)*100

Project = Executive Report (Graded from 0 – 50) + Presentation (Graded from 0 - 50)

Final Grades:

Number Range(inclusive-exclusive)	Grade
93.0-101.0	A
90-93	A-
87-90	B+
83-87	B
80-83	B-
77-80	C+
73-77	C
70-73	C-
67-70	D+
60-67	D
0-60	F

Attendance and Participation
All students are EXPECTED to be present during our weekly classes and must participate. Note that BOTH are part of your 10% grade. I understand that things come up and sometimes you

cannot make it to class. With that said, I am only requiring you to show up and participate for 10 out of the 12 classes (Exams NOT included). Which means, you can choose to take 2 classes to yourself. BE ADVISED. I DO NOT RECOMMEND SKIPPING CLASS! This is a summer course, and as such, we move VERY fast through the material. If you skip a class, for what ever reason, you, and only you, are required to catch up on the material you missed out on. Attendance is taken right before the weekly class break (around 7:45pm). If you show up PAST this time, your attendance will NOT be counted. Earning a participation credit is done by simply asking a question, contributing to a discussion or presenting on material.

Case Studies

You will be assigned four case studies to write. Each case study covers about two – three classes worth of materials. Please note that each case study has questions at the end. Typically each one will have four questions. DONT GIVE ONE SENTENCE ANSWERS! At the other end of the spectrum, don't give me a novel. Minimum one paragraph for each question, maximum two paragraphs. To clarify, each paragraph should be about five sentences that are not run on sentences. Each question will ask you to essentially solve a problem. If the problem requires you to use a spreadsheet, please attach not only a pdf document to the BB submission, but also the excel file itself. YOU MUST EXPLAIN YOUR RESULTS! We will get more into this later in the course. I am not a huge stickler on the format of the submissions, so don't fret too much over that. Worry more about how to solve the problem, how does the problem relates to a real-world application, and how you can explain what the results mean in plain English.

Group Project

You will be required to take part in a group project. You are free to choose your team members. Ideally, I would like four people to a team, but this may change depending on the size of the class. I do NOT want anyone working alone. If you cannot find a team, I will assign you to an already formed team. The project itself will be assigned to you once teams are formed. Each team will be assigned a different project. Typically, the project will consist of you developing an operations and supply chain strategy for a case assigned to you, forecasting the demand, determining if the capacity needs to be expanded, how you will go about expanding it, how you can minimize the bullwhip effect and solving a mathematics-based problem associated with your strategy. This can be a facility location problem, a transportation routing problem, a production-cost allocation problem, an inventory problem or any of the other models we discuss in class. There will be two parts: An executive report and a presentation.

Executive Report

For this part of the project, you are required to write up the overall proposed strategy for the case given to you, the various business processes involved in the strategy and how you plan to implement the strategy via operations analysis. Write it as if you are submitting this report to a Chief Operating Officer that may not be entirely familiar with analytics. While you MUST include your mathematical model, results, and data, you need to be clear as to how this strategy will help the company, how it will improve various business processes, how it is aligned with the overal firm strategy given in the case study as well as the firm's mission statement and what implementation issues and concerns you possibly see with implementing your operations strategy. Were there any problems with the data? What about the assumptions of your model? Make sure you address all of these. This will be 50% of your presentation grade.

Presentation
The remaining 50% will be your presentation. I am not sure on time limits yet, but this will be determined based on how many groups we have. Each member of the group must present at least one portion of the project. You must present as if you are presenting to a room full of executives that have little knowledge on your newly attained analytics background. Provide practicality for them. You can show your model, but explain it in English, not in mathematics jargon. DONT READ OFF FORMULAS. After putting so much work and effort in your project, the last thing you want to do is put people to sleep. I have a mathematics degree and even I fall asleep when people read off formulas. It is on the slide, you don't need to read it to me. Instead, explain it to me. Tell me what the assumptions were, what are the problems with the assumptions (how strong or weak are they in the context of the case study I gave you), what the contraints mean, what the objective is, etc. The presentation is not meant for you to read to the class. Explain what the bullet points are saying. Don't turn your back to the class reading off the slides. You will be graded on (1) the content of your work, (2) how well your work contributes to the given strategy in the case study (3) how well your operations strategy was planned analytically, (4) how well you explained your data, model, results and strategy, (5) your communication skills. You will be given a score of 0-10 for each of these, added together will be the total of your 50% of the project.

Exams

There will be two exams, the midterm and the final. Each will be worth 30% of the final grade. You will be allowed 1 hour and 45 minutes hours to complete the exam. Make-up exams are not encouraged, however if it is absolutely necessary to miss an exam, notification must be given BEFORE the exam in a written form at a **MINIMUM** of two weeks prior to the exam. Failure to inform me anytime less than two weeks prior will result in a 0. The **ONLY** exception is if it is some form of medial emergency and the proper documentation must be presented. Otherwise a make up exam will not be allowed. Essay style make-up exams will be given during my office hours (by appointment) for those with well-documented excused absences. Any makeup must be completed before the exams are returned to the class, which generally will be the session following the exam. Suggestions for studying for the exam: Attend the class, listen to in class discussions, read the book chapters and DO PROBLEMS!

Tentative** Course Outline

Date	Topic	Chapters	Due Dates	Notes
5/28/2014	Operations Strategy, Processes, Learning Curves, Strategy for capacity, Supply Chain Management	(POA) Chapter 1, Chapter 6 (Intro, 6.5, 6.7 – 6.10 Handout 1.		
6/4/2014	Demand Forecasting	(POA) Chapter 2 (Sections 2.1-2.7		Case Study #1 Assigned (Material: Handouts 1,2,3)

Myles D. Garvey

Date	Topic	Reading	Due	Assigned
		(LN) 2.1-2.3 Handout 2.		
6/11/2014	Demand Forecasting	(POA) Chapter 2 (Sections 2.8-2.12 (LN) 2.4 – 2.7 Handout 3		
6/18/2014	Linear Programming, Binary Variables, MIPs	(POA) Chapter 3, Sections: Supplement 1 (LN) 3.2 – 3.4 Handout 4	Case Study #1 Due	Case Study #2 Assigned (Material: Handouts 4,5)
6/25/2014	Sales and Operations Planning Techniques (S&OP)	(POA) Chapter 3(Sections 3.1-3.11) (LN) 3.1,3.5,3.6 Handout 5		
7/2/2014	Inventory Planning (Midterm Exam)	(POA) Chapter 4 (Sections 4.1-4.9) (LN) 4.1-4.3 Handout 6	Case Study #2 Due	Case Study #3 Assigned (Material: Handouts 6,7,8)
7/9/2014	Inventory Planning with uncertain demand	(POA) Chapter 5 (Sections 5.1-5.8) (LN) 4.4,4.5 Handout 7		Midterm Exam
7/16/2014	Operations Scheduling and Queuing Theory	(POA) 8.1 – 8.6; Supplement 2 Handout 8	Case Study #3 Due	Case Study #4 Assigned (Material: Handouts 9,10,11)
7/23/2014	Transportation Problems and Facility Location	(POA) Chapter 6 (6.1,6.2,6.3,6.4,6.6) Chapter 10, (Sections 10.1-10.5, 10.8,10.10) Handout 9		
7/30/2014	Project Management	(POA) Chapter 9, sections 9.1-9.5 (LN) 6.1 – 6.5 Handout 10	Case Study #4 Due	
8/6/2014	Presentations			
8/13/2014	Final Exam			Final Exam

This schedule may be amended or changed at any time as necessary based on the Professor's discretion