Piedmont Project 2005

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Goizueta Business School

My goal is to further incorporate the three foci of the Piedmont Project into my courses:

(1) Environmental Sustainability,
(2) Social Justice, and
(3) Connection to Place.

Rather than constructing a new course along these lines, I have sought to include these issues in the four courses I currently teach. I started to educate myself on the first two topics last year and found that there is a large amount of teaching material available in my field.

Pedagogically, approximately one-third of the class time in business schools is spent on "case studies" of particular business situations. The BELL project (Business-Environment Learning and Leadership, bell.wri.org) has approximately 50 class-length case studies available for use. Additionally, I came across Interface Corp. personnel who agreed to be guest speakers for my class. A case study has also been written about Interface by Harvard Business School.

The incorporation of these themes are listed by each class. The syllabi for the classes are attached. Piedmont Project related material is listed in bold type.

Course: Supply Chain Management

"Supply chain" refers to the common business practice of one company buying parts from another company, who in turn buys parts from another company, etc. The companies are linked together in a "chain" of supplying each other.

While virtually all students come into the course believing that their particular firm should not promote spoiling the environment and causing social injustice, they draw the line at supply chain partners. The typical response is, "that's a different company in a different country, who are we to say what they can or cannot do?"

To engage students in a discussion of what responsibility a supply chain partner has in changing policies in a different company, I now use the following case studies and guest speaker:

Green supply chains: Guest Speaker Jim Hartzfeld, VP – Sustainable Business
Strategy, Interface Research Corp.

Case study: **Interface's Evergreen Services Agreement**

Birth to death product design case study: **Bayerische Motoren Werke AG (A)**

Supply Chain Ethics case study: **Levi Strauss & Co.: Global Sourcing**

The Interface speaker and case study discuss the transformation of Interface into one of the world's leading environmentally friendly manufacturers.

The case **Bayerische Motoren Werke** concerns the requirement of the German government that auto manufacturers be responsible for the entire life cycle of their products. Under laws established in the early 1990's each car manufacturer is responsible for the dismantling and final disposal of their cars. The case discusses how cars should be designed differently up-front with sustainability in mind. `

The **Levi Strauss** (denim jeans) case examines social justice. As a company, Levi Strauss has policies against using suppliers that use various forms of forced labor or operate in countries with policies that assist forced labor. At the time, the Chinese policy of making employers force employees to obey the "one child" rule, as well as various human rights abuses, causes Levi Strauss to withdraw from the Chinese market.

Course: Service Operations

This course is concern with how service sector companies deliver services to the customer. In general, service sector firms do not cause much pollution, nor do they face many international issues. However, I have endeavored to create a "connection to place" in this course. The majority of my MBA students stay in the Atlanta area. Consequently, to ground these students in the Atlanta area, and to make them feel a connection to more than the bars, I have incorporated the following:

Guest speakers: Vega String Quartet and Will Ransom, Music Department
Class will be held at the Schwartz Performing Arts Center.

Atlanta Symphony Orchestra
Guest: John Sparrow, Vice President and General Manager,
Atlanta Symphony Orchestra
Visit to ASO

All of these components of the course represent the "hidden curriculum." The official pedagogical reason to incorporate them is to examine the operations of providing customer experiences. The actual reason is to provide students with a connection to Emory and the Atlanta area.

Will Ransom of the music department has partnered with me to provide my students an experience in the Schwartz Center. Although the Schwartz Center is contiguous to the business school, 95% of my students have never set foot inside it. Using a concert in the Center as a ruse, the magnificent architecture and sound qualities of the Schwartz Center are presented to the students.

For the Atlanta Symphony Orchestra (ASO), once again the case discussion is a ruse to get them to go downtown and attend the symphony. The ASO has been kind enough to provide my students with free tickets to the symphony. In class, the General Manager of the symphony, who is also the main decision maker in the case study the students prepare, speaks to my class about the role of the ASO in Atlanta and the value of the arts.

Class: Offshoring and Outsourcing

This class is concerned with offshoring, the movement of U.S. jobs to other countries, and outsourcing, the hiring of other firms to do the work formerly done within a company. The following aspects of the class are relevant:

> **Ethics, Governmental Policy, The Western Backlash**
> "International Sourcing in Athletic Footwear: Nike and Reebok" case study

Social justice issues are explored in the comparison of Nike and Reebok. Each footwear manufacturer has a different policy regarding social justice regarding their offshore suppliers.

Class: Management Science in Spreadsheets

This is largely a math class. The point is to demonstrate how a special type of mathematics called "linear programming" (an advanced matrix algebra topic) can be used to solve practical business problems.

One particular business problem that was solved by this method is displayed in the course:

> Case Study: **Armco and the "Bubble Policy"**

Armco was the 8th largest steel manufacturer in the U.S. This case discusses a landmark decision by the Environmental Protection Agency to deal with companies with a "bubble" policy. That is, prior to this policy, each particular smokestack was specifically regulated by the EPA. With this case the EPA decided to regulate Armco as a "bubble." That is, to regulate the overall level of pollution that Armco emitted. Linear programming is used to create the best joint solutions between the EPA and Armco to find optimal policies that both minimize pollution while maximizing profits.

BUS 553: Supply Chain Management

Instructor:	Rich Metters
Telephone:	404.727.7089
E-mail:	Richard_Metters@bus.emory.edu
Office Hours:	M-F 9:30-5 (except T,Th1-2:30)or by appointment office 415

Course Material

- Case studies available electronically on the internet from www.Study.net.
- Readings available electronically on e-reserve.
- Optional text, Supply Chain Management, Strategy, Planning and Operation, 2nd ed. Chopra and Meindl, 2004. ISBN 0-13-101028-X (not available at the bookstore).

Course Overview

The **supply chain** is the system by which organizations deliver their products and services to their customers. Supply chains include *physical* activities (such as receiving goods, production, and transportation) and *informational* activities (such as product design, purchasing, and planning). The term "chain" is used because these activities typically link the efforts of many different companies and functional areas. **Supply chain management** represents the conscious effort by firms to develop and run supply chains, rather than individual firms, in the most effective and efficient way possible.

The course is divided into three main sections.

Part 1: Inventory and Information Within a Firm

This course concerns relationships between firms involving information and inventory. As a precursor to understanding the value and design of inter-firm relationships, this part of the course reviews the major methods by which inventory and information are handled within a firm.

Part 2: The Benefits of Cooperative Supply Chains

The benefits of cooperation between supply chain partners is quantified and several methods of achieving cooperation are studied.

Part 3: International Issues

Supply chains frequently cross international borders. Specific problems relating to international sourcing are presented.

Grading/Workload

The course grade will include both individual and group components. Individual components include class participation and a final exam, while group components include written case evaluations, quantitative assignments, and the mid-term exam.

Group grades

Littlefield Technologies 1&2 (15%)
Choose 3 from: (10% each)
- Supply Chain Close-up: The Video Vault
- Bayerische Motoren Werke AG
- Sport Obermeyer
- Emerson Electric
- HP Deskjet Printer

Individual grades

Participation (20%)
Midterm exam (15%)
Final exam (20%)

Participation is required. Due to the interactive and experiential nature of the course, preparation and participation are imperative. **Repeated lack of preparation will result in course failure, regardless of other course grades.**

The majority of the participation grade will center on case discussion in class, but participation in all class sessions is graded. The purpose behind this is to foster stimulating class discussions. As to case studies, specific questions will be handed-out to guide case analysis, but ideas regarding cases should not focus solely on the questions handed-out.

Group grades are based on grades for the written cases as well as group class participation in group oriented activities. "Group Peer Grade" refers to the grade given a student by other students in their group. At the end of the semester, students anonymously grade the performance of other group members. The "Group Peer Evaluation" form used for this purpose is included in this syllabus. In addition to graded cases, there will also be several assignments that require group work.

Group Case requirements:

For style considerations, a review of the case is unnecessary, but it is important to cite case facts to justify conclusions. Also, a balanced approach is recommended for case write-ups. Comment on both the strengths and weaknesses of managerial action depicted in the case, rather than focusing in only on weaknesses.

Questions will be handed-out to guide case write-ups. The case write-up should not focus solely on the questions handed-out. Arriving at satisfactory answers to the

questions asked will receive a "PS." While content is the preeminent consideration, poor editing (e.g., incorrect spelling, inconsistent spacing, poor grammar) will result in a lower grade.

The main objective of requiring written cases is to provoke thoughtful, reasoned arguments that enhance the educational process for the entire class. For that reason, **arguments must be raised in class discussion to count for grading in a case write-up**.

Participation grading standards will be described in class.

GROUP PEER EVALUATION

Name

The group component to the grade for an individual is the combination of the group grade and the group peer evaluation. The overall group grade is adjusted for an individual in response to the peer evaluations.

List your group members - other than yourself - in the spaces provided. Included in your assessment of group contribution can be such areas as: meeting attendance, punctuality and preparedness; helpful or disruptive attitudes at meetings; contribution to group discussion; etc.

For each individual in a group, the group grade is adjusted up or down on the basis of the peer evaluations. For active group members, assign positive or negative grade points based on their group contribution. For example, a +1.0 indicates a helpful group member who deserves a full letter grade above the group average and -1.0 indicates a full letter grade below the group average.

Alternatively, you can designate a specific grade for group members. This is usually appropriate when an individual has made little or no contribution to the group. In that case, a designated "LP" or "NC" may be appropriate. This is taken seriously in overall grading. If, for example, the group peer evaluations give an NC grade to an individual, the individual will fail that portion of the course, regardless of the overall group grade.

If there are circumstances which should be considered in the group peer evaluation, write your comments on this page. Due to the potential for misrepresentation and lack of confidentiality, this form must be handed to me in person.

Group Member	Point Score	Designated Grade
Do not include yourself in this list		
Example:		
Jane Doe	+0.5	

Expected Class Schedule: Actual mileage may vary
Cases in bold print

9/6 Course Introduction

Part 1: Inventory and Information Within a Firm

Capacity and lead times
Introduction to **Littlefield Technologies**
Optional reading distributed in class.

9/13 Inventory – Independent demand
Inventory game
Reading: Chapter 10 (Inventory Management) from "Logistics: An Introduction to Supply Chain Management" by Waters, available on e-reserve and handed out in class on 9/7.

Start round 1: **Littlefield Technologies**

9/20 Inventory – (probably more) Independent demand

Inventory – Dependent demand: Material Requirements Planning
Reading: pp. 167-177 from "Logistics: An Introduction to Supply Chain Management" by Waters, available on e-reserve.

9/26 No class
Round 1: **Littlefield Technologies** write-up due.

9/27 Master Production Scheduling Game
Cost of uncoordinated supply chains (preview): learning curves
Start round 2: **Littlefield Technologies**

10/4 Just-In-Time systems
Reading: **Does Manufacturing Need a JIT Revolution?**
Just-In-Time case study: **Toyota Motor Manufacturing, USA, Inc.** 9-693-019

10/11 (No class – Fall break)
Group **Littlefield Technologies** assignment due

10/18 Mid-term exam

Part 2: The Benefits of Cooperative Supply Chains

Reading: **What is the Right Supply Chain for Your Product?**
Reading: HBS note **Aligning Incentives in Supply Chains** 9-600-110

10/25 Costs of Uncoordinated Supply Chains:
Supply Chain Close-up: The Video Vault 9-102-070
Specific topics: double marginalization; revenue sharing; markdown money; joint inventory ordering
Optional reading: Chopra and Meindl, pp.258-264, available on e-reserve.

Syncra Systems 9-601-035

11/1 Strategic supply chain alliances
Laura Ashley and Federal Express Strategic Alliance 9-693-050
Guest Speaker: Sean Flaherty, Marketing Manager, UPS Supply Chain Services

11/8 High variety, quick response supply chains
Guest Speaker: Allen Podratsky, SVP Product Development and Supply Chain Management, Simmons Company

JIT II: **Bose Corporation: The JIT II Program (A)** 9-694-001

11/15 Green supply chains: Guest Speaker Jim Hartzfeld, VP – Sustainable Business Strategy, Interface Research Corp.

Interface's Evergreen Services Agreement

Part 3: International Issues

11/22 Forecasting: **Sport Obermeyer, Ltd.** 9-695-022

Cost analysis in international Sourcing: **Emerson Electric Company**
APC Division: The Fan Subpack Sourcing Decision (Darden) UVA-OM-0631

11/29 Supply Chain Ethics: Levi Strauss & Co.: Global Sourcing 9-395-127

Bayerische Motoren Werke AG (A) (Not available on study.net)

Final Exam

Business 658: Service Operations
Course Syllabus, Fall 2005

Instructor: Rich Metters
Telephone: 404.727.7089
E-mail: Richard_Metters@bus.emory.edu
Office Hours: Monday-Friday 9-5 or by appointment, office 415

Course Material
Textbook: "Successful Service Operations Management," (2003) by Metters, King-Metters, and Pullman. ISBN 0-324-13556-4.

Case studies are available on the Web at Study.net (some of which will be handed out in class, but are paid for via Study.net). Some case studies and additional readings may be distributed by e-mail or put on electronic reserve.

Course Concept
The principal course objective is to explore operations specific to the service sector. In addition to the perspective of a service sector manager, the perspective of a consultant to the service sector is given some emphasis, in both the roles of being a consultant and when to use consultants. The course is divided into four basic sections:

Phase 1: "Operations Strategy"
Preparation for general management careers often focuses on strategy. Further, the bulk of many consulting assignments continues to be general strategic consulting. Consequently, cases and lectures are used to develop and assess strategies specific to service operations.

Phase 2: "Managing Experiences"
Economic progression has seen most developed economies move from an agricultural economy, to a manufacturing economy, then to a service economy. It has been proposed that a further development in this progression is an "experience economy." Here, we consider how to manage customer and employee "experiences."

Phase 3: "Capacity Management (Revenue Management)"

Tactically, one of the most difficult questions for service operations is managing capacity. Unlike manufacturing operations, capacity in many services cannot be stored in the form of inventory. We will look at three techniques of capacity management that are collectively known as "yield management": overbooking, capacity allocation between classes of customers, and differential pricing for identical capacity.

Phase 4: "Putting science into 'gut feel'"
Many of the most important managerial decisions in many services are often decided based on anecdote, rather than data. We explore simple mathematical methods for selecting locations, selecting customers, and other topics.

Course Methods

Primarily, the pattern of instruction on a specific topic includes a discussion/lecture followed by a decision oriented case. The course is structured around group work. Both group cases and in-class group work are central activities.

Grading

Grading is intended to make both the group and the individual accountable. There are graded case assignments as well as exams.

Group Grade x Group Peer Grade	35%
Final Exam	35%
Participation	30%

Group grades are based on grades for the written cases as well as group class participation in group oriented activities. "Group Peer Grade" refers to the grade given a student by other students in their group. At the end of the semester, students anonymously grade the performance of other group members. In addition to graded cases, there will also be pass/fail case assignments that require group work, as well as a class length group game.

Case requirements can differ significantly depending on the case. In general, a group write-up of no more than five double-spaced pages (excluding exhibits) is sufficient. For more numerically oriented cases, less writing is needed. There are, however, no minimum or maximum page lengths and no specific formatting requirements.

For style considerations, a review of the case is unnecessary, but it is important to cite case facts to justify conclusions. Also, a balanced approach is recommended for case write-ups. Comment on both the strengths and weaknesses of managerial action depicted in the case, rather than focusing in only on weaknesses.

Questions will be handed-out to guide case write-ups. The case write-up should not focus solely on the questions handed-out. Arriving at satisfactory answers to the questions asked will receive a "PS." Although

no specific format is required, poor editing (e.g., incorrect spelling, inconsistent spacing, poor grammar) will result in a lower grade.

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If there are circumstances which should be considered in the group peer evaluation, write your comments on this page. Due to the potential for misrepresentation and lack of confidentiality, this form must be handed to me in person.

Group Member Do not include yourself in this list	Point Score	Designated Grade
Example:		

Jane Doe	+0.5

Class Schedule: Life is uncertain, so is this schedule.
Cases in bold print

Phase 1: "Service Operations Strategy"

9/6 Course introduction (optional textbook reading: Chapter 1)

Different views of services (optional readings on e-reserve):
"Are Services Really Different?" (1992) Lovelock, pp. 1-8 in Lovelock (ed.) *Managing Services*.

"The Customer Contact Approach to Services: Theoretical Bases and Practical Extensions" (1981) Chase, *Operations Research*, 29(4).

"The Four Service Marketing Myths" (2004) Vargo and Lusch, *Journal of Service Rearch*, 324-335.

What should services do?
"Production-Line Approach to Service" (1972), Levitt, *Harvard Business Review*, Sep-Oct.

"How Can Service Businesses Survive and Prosper?" Schmenner, pp. 31-43 in Lovelock (1992), *Managing Services*

9/8 Decoupling Services (reading: Chapter 7 of textbook)

9/13 Outsourcing and Offshoring (Reading handed out 9/7. Caselette at the end of the reading.)

9/15 Quality: The Gurus speak – the views of Deming, Juran, and Crosby

9/20 Offshoring Guest speakers:
Jim Stachura, Director of Research and Analytics, Aelera Corp.
Dustin Crane, CEO, Aelera Corp.

9/22 Six-Sigma Quality Tools: Guest speaker, Steve Walton
(reading to be handed out 9/16)

Phase 4 (the pre-quel): "Putting science into 'gut feel'"

9/27 Waiting Lines

9/29 Waiting Lines part Deaux

10/4 **Global Financial Corp.** (Group case write-up)

Phase 2: "Managing Experiences"

(reading: Chapter 6 of textbook)

10/6 **Shouldice Hospital** (Minor group case write-up required)

10/11 No class – Fall break

10/13 **PY and the Dome** (case will be e-mailed)

10/18 Guest speakers: Vega String Quartet and Will Ransom, Music Department

Class will be held at the Schwartz Performing Arts Center.

10/20 Atlanta Symphony Orchestra (minor group case write-up required)

Guest: John Sparrow, Vice President and General Manager, Atlanta Symphony Orchestra

Visit to ASO: Date TBD

Phase 3: "Capacity Management (Revenue Management)"

10/25 Capacity management lecture

required reading: Chapter 2 "capacity strategies", pages 17-19, and Chapter 9.

Optional reading on e-reserve:

"Yield Management at American Airlines" (1992), Smith, Leimkuller, and Darrow, *Interfaces,* 22(1), pp.8-31.

"Hold My Place, Please" (1995), Harris and Peacock, *Marketing Management*, 4(2), pp. 34-46.

10/27 Capacity management lecture

11/1 **Yield Management at MotherLand Air** (in-class group game, no write-up required. Prize for winning team. Game is on pages 175-178 of the textbook. Data is on student CD.)

11/3 **The Parker House: Sales and Reservations Planning** (Group case write-up required)

Phase 4: "Putting science into 'gut feel'"

11/8 Site selection (reading: Chapter 14. Skip pages 304, 306-307)

11/10 Site selection – again

11/15 **La Quinta Hotels** (Pages 311-317 of textbook. Group case write-up required)

11/17 Multiple Site Performance Evaluation (reading: Chapter 15)

11/22 **Branch Performance at Nashville National Bank**
(Pages 332-337 of textbook. PASS/FAIL group case write-up)

11/24 Thanksgiving holiday

11/29 Scoring systems (reading: Chapter 16 of textbook)
Optional reading on e-reserve:
"Managing Consumer Credit Delinquency in the US Economy: A Multi-Billion Dollar Management Science Application," (1992) Makuch, Dodge, Ecker, Granfors, and Hahn, *Interfaces*, 22(1), pp. 90-109.
"Database Marketing Increases Prospecting Effectiveness at Merrill Lynch," (1994) Labe, *Interfaces*, 24(5), pp. 1-12.

12/1 **MBA Savings & Loan** (Pages 351-355 of textbook.
PASS/FAIL group case write-up)

Final exam

Lead Week: Offshoring and Outsourcing

Instructor: Rich Metters
Office 415
Telephone: 404.727.7089

Course Objectives

This course concerns two related, but distinct business practices: Offshoring and outsourcing. There is a considerable amount of misinformation, confusion, and apprehension regarding offshoring and outsourcing. In the most recent presidential campaign these terms were used, and misused, frequently. They remain emotional hot-buttons for many.

The learning objectives of this course are

- to separate the facts from the hype,
- to identify current practice,
- to determine best practice,
- to develop appropriate models of strategic fit, and
- to explore ethical and public policy issues.

Class Schedule:

Monday, January 23: Underpinning Theory of Outsourcing/Offshoring

Manufacturing:

Strategic Contingency viewpoint
Product-Process Matrix

Services:

Customer Contact model
Services De-coupling model

Tuesday, January 24: Choice Complexities, Models of Offshoring/Outsourcing

Manufacturing:

Required reading: "Emerson Electric" case study
Questions to consider:

1. What are the sources of risk to ACP in each of the alternatives?
2. An Excel file (sent to the course conference) calculates the landed total costs of each alternative (rather than typing in the excruciatingly complex exhibits). There are some costs that "total landed cost" does not count, such as tooling and expenses related to auditing foreign operations that should also be considered. Determine the best choice from a cost basis.
3. Where should the fan subpack be sourced?

Services: Which services are offshored/outsourced,
Extent of the market,
History of offshoring,
Risks of offshoring.

Wednesday, January 25: Ethics, Governmental Policy, The Western Backlash Manufacturing:

Required reading: "International Sourcing in Athletic Footwear: Nike and Reebok" case study

Questions to consider:

1. **Evaluate Nike's "Memo of Understanding" (ex. 6) and Reebok's "Human Rights Production Standards" (ex. 7). Which do you favor?**
2. **Phil Knight replies that Nike is not "gouging" by pointing to operating profits that are in line with the industry. Assess his argument.**
3. **Does shifting production between countries, such as from S. Korea to Indonesia, raise any ethical concerns?**
4. **What responsibilities does a multinational corporation have regarding labor, environmental, and other standards in foreign countries? How does outsourcing change that responsibility?**

Services: Introduction to cultural issues,
Governmental response to offshoring,
"Homeshoring" movement.

Thursday, January 26: (Outsourced) Cultural Issues

Required reading: "Femininity and Flexible Labor" by Carla Freeman

Guest speaker: Carla Freeman, Professor, Women's Studies and Anthropology, Emory University.

It is often noted that a process cannot simply be moved from the U.S. to another country as is. Professor Freeman will identify why. Professor Freeman is the author of <u>High Tech and High Heels in the Global Economy</u>, a book about the offshoring of back-office service work. As part of her research program, she spent three years on site in an offshored back-office service firm in Barbados.

Friday, January 27: (Outsourced) Implementing an Offshoring Agreement

Guest speaker: Nitin Kapila, President, GRM Group (Global Resource Management)

GRM Group (www.grmgroup.net) facilitates relationships between U.S. firms and, largely, Indian firms. They specialize in Business Process Outsourcing of services and service components of manufacturing firms, such as Human Resources, Finance, etc.

Management 557P: Management Science in Spreadsheets

Instructor: Rich Metters
Telephone: 404.727.7089

Course Textbook
Practical Management Science, 2nd ed., by Winston and Albright, 2001.

Course Objectives
This course demonstrates two quantitative tools that have wide applicability in business practice: linear programming and simulation. The focus is on linear programming. These tools are used in every functional area in a significant majority of large firms.

The objective is not to create expert mathematicians. The theoretical underpinnings of these techniques will be discussed only as needed. Rather, the emphasis is on assessing the applicability of these techniques in practical situations.

WARNING: the course objective is NOT to make you "handier" at Excel. Although you will become more familiar with the capabilities of spreadsheet software packages and we will be performing virtually all classwork in Excel, the course is not designed to assist in becoming an Excel expert.

Course Methods
The work in this course will largely consist of structuring managerial problems mathematically in spreadsheets. Consequently, class time is expected to focus on utilizing spreadsheets.

Grading
Proposed: 60% exam, 40% class leadership. Exact grading scheme to be decided in class.

Class Schedule: This schedule is subject to change

Understanding the Basics of Linear Programming

8/9 Course Introduction (ch 1 - optional)

The Basics of Modelling Business Decisions as Linear Programs (ch 3-3.3, 3.5, 3.7, pp. 67-77, 82-85, 90-95)

Accounting/Finance/Operations: cost accounting and production planning

Operations: the diet problem (p.67-68)

Linear Programming in Pictures: Graphical/Sensitivity Analysis (ch 3.4, 3.6, pp. 78-83, 86,87)

Economics/Finance/Cost Accounting: calculating marginal costs/revenues and transfer prices

Operations: Blending problems (ch 4.5. pp. 137-142)

Multiple objective functions

Finance: Asset allocation (p.145 question 28)

SolverTable (p. 78)

Modelling Business Decisions with Linear Programming

8/11 Operations/HR: Workforce Scheduling (ch 4.2 pp. 113-118)

Finance: "Blending" a portfolio: Bond selection (p.143, question 25)

Sequential Decision Making (ch 4.3)

Operations: Aggregate planning (pp. 120-129)

Finance: Short-term cash flow planning (ch 4.7, pp.154-159)

Non-linear objective functions (non-constant returns to scale): Piece-wise approximation

Marketing: Media selection

8/13 LP with no objective function

Finance: Arbitrage (case 4.2, p.189)

Non-profit pricing

Operations: Finding feasible schedules

LP Under Uncertainty

Finance: Cash flows with inaccurate forecasts

Operations: Production planning with inaccurate forecasts

8/16 Data Envelopment Analysis (ch 4.8, pp. 162-168)

Case study: DEA At Nashville National Bank (to be e-mailed)

Environmental LP: Armco

8/18 Guest Speaker: Gene Ramsay, Profit Point, Inc.
(expected class ending time: 8:30

8/20 **Integer Programming**
Finance: Capital budgeting (ch 6.3, pp. 278-284)
Operations: Facility location (ch 5.2, 6.6, 6.7, pp. 193, 306-316)

8/23 **Simulation**
Inventory and Financial problems (ch 12.2-12.3)
Queueing (ch 14)

8/25 Environmental LP: Armco

8/27 Exam