Geza Bottlik **ISE335L Supply Chain Design** **Spring 2019**
Revised 12/18/2018

Instructor:	Geza Bottlik bottlik@usc.edu
Office Hours:	Tue/1Thu, 12:45 P.M. –1:45, Room GER 202 Room GER 202 or by appointment
TA:	TBD
TA Office Hours:	TBD
Class time/place:	Tue/Thu 9:30 – 10:50 A.M. GFS118
	Lab hours Mon 5:00 – 5:50 P.M. SAL127

Web Pages: https://blackboard.usc.edu, www.gezabottlik.com

Course Description: Design of Supply Chains. Product, distribution, transportation and site selection. Analysis and optimization of supply chain networks.

Learning Outcomes: Upon completion of this course the student is expected to have demonstrated his/her ability to know and properly use:

1. Understanding the basic concepts of Supply Chain networks, Supply chain quantitative modeling of various decision problems.
2. How to do performance analysis and deal with supply chain risks and uncertainties.
3. Understanding the need of forecasting, quantitative methods, and innovation in supply chain Ecosystem.
4. Basic knowledge of pricing strategies, outsourcing and transportation decisions.
5. Learning the basic concepts of information technology in a supply chain.
6. Excel and Arcview

Pre-Requisites:
ISE 330, 460. You must have these pre-requisites to enroll in this class. You will be expected to apply methods from these courses in your homework and projects.

Test Schedule:

Midterm 1:	Thursday, February 14, 2019	1 hour 20 minutes
Midterm 2:	Thursday, March 21, 2019	1 hour 20 minutes
Final:	Tues 5/7/2019	8:00 A.M. – 10:00

The midterms and final will be based on lectures, discussions in class, homework and quizzes. **All tests and quizzes are open book and open notes and laptops**. Students are expected to **apply** what they should have learned up to that point to analyzing situations, identifying the problems and applying the appropriate techniques to solve them or interpreting computer solutions.

Assignments:
Readings, problems and software exercises will be included in each week's assignment. These are assigned on Tuesday and are due on the following **Monday at midnight on the assignment manager on Blackboard.** We will return the assignments electronically only if there are any points taken off. Reading assignments are due when the material will be covered in class. It is imperative that you **prepare for class** -- you will find it extremely difficult to follow the discussion if you have not read the material.

I will **not accept** late homework, unless **prior** arrangements have been made (e.g. out of town funeral). Homework is to be a **digital Word (or Excel) 2010 or later file**. Do not type results into spreadsheets – use formulas. If it is a team assignment, the team members' names, assignment number, the date and any other team that you worked with must be in the **header**. Use a consistent template and format the output for a professional appearance. A sample will be available on the web site. File names are assigned by the assignment manager. Use the shortest possible title for your file –e.g 335_1. **There can only be one file per homework. (no zip files)**.

The assignments should be as professional in appearance as if you were preparing reports at work or for publication. Clearly label the problem number and your conclusions for each problem, followed by the supporting calculations. Do not use photos of your work – scan if necessary. **The problems must be in the order assigned. Out of sequence problems will receive no credit.**

Assignments will be either individual or team. If two teams discuss or collaborate on a homework, they must indicate that on their assignments. Each team must turn in a separate homework. Generated data and essay questions must be unique to each team.

It's OK to work on individual homework together, but finish it by yourself and indicate with whom you worked. For individual homework each student must turn in a separate homework. Generated data and essay questions must be unique to each student Do not give your files to others and do not use others' files. Do not copy problems. Homework files will be named by the assignment manager in addition to your file name, so keep it short as indicated above, otherwise I have to truncate it to be able to open it. The same rules apply among teams for team assignments. **If the answer is given in a book, don't just copy it, explain how you got it.**

Objectives and Content

This course introduces students to strategic issues in the design of production and distribution systems. ISE 410, which covers tactical and operational issues in these systems, such as scheduling, inventory control and operational planning, follows this course.

The focus is on design issues accompanying major investment in facilities, emphasizing the purpose of facilities and the location of facilities. Another emphasis is on transportation of products between and within facilities. Finally, students will be exposed to the basics of supply chain management.

ISE 335L includes a strong element of exposure to software in demographics. Students learn professional level software. ArcView (a-geographic-information-system) will be used for demographics.

Lastly, students will develop their technical communication abilities through a course project for supply chain and facility selection.

It is up to you to become familiar with and learn the mechanics of the material in the texts. I am here to explain things you don't understand, to add things that are not in the book, and to evaluate whether you can apply the material to real problems.
The lecture and class discussion is a supplement to what is contained in the books. It is NOT intended to be a duplication of what is contained in the books.

I am looking forward to an intellectually stimulating and rewarding semester with you.

Quizzes:

We will have approximately 9 quizzes during the semester. I will let you know the week before if there will be a quiz the following week. These are short, usually with one or two problems or about 10 True and False or fill in the blank. There are no makeup quizzes, so show up for them.

Required Text:

Supply Chain Management, Sunil Chopra and Peter Meindl, Prentice Hall, fourth or later edition.

Grading:

Team Project	~16%	16 points	
Homework	~15%	15 points	1 or 1.5 pts each (- 0.5 if not submitted)
Laboratory	~10%	10 points	(by the TA) 1 point each (- 0.5 if not submitted or made up)
Midterm Exam 1	~9%	9 points	
Midterm Exam 2	~12%	12 points	
Final Exam	~21%	21 points	
Participation (Attendance, **discussion**, **preparedness for class, in class feedback**)	~5%	4.8 points	0.2 pt. each
Quizzes	~12%	12 points	1.5 pt. each

The grade for the course will only be based on the required work listed above and cannot be improved with additional work. Note that the average difference between adjacent grades is less than 1%.

References: Miller & Freund's Probability & Statistics for Engineers, Richard A. Johnson, Prentice-Hall, 1994 [A very clear and straightforward book – I used it for a two semester course in probability and statistics]

Introduction to Operations Research, Hillier, Frederick S And Lieberman, Gerald J, Mcgraw-Hill, 1995

Contemporary Engineering Economics 3rd Ed. - C. S. Park. Menlo Park, CA, Addison Wesley Publishing Company (www.prenhall.com/park or www.eng.auburn.edu/~park/cee.html

Projects:

There will be one project. The project will be done by a team of students (four or five members). Team members will receive identical grades except as modified by peer evaluation of the level of contribution and the executive summary. The purpose of the projects is to familiarize students with the process of selecting a problem, defining an approach, gathering data, analyzing the data and presenting them, drawing conclusions and discussing the results, as well as evaluating performance

Much of your career will be spent generating reports by which you will be judged, so this is good practice. Consultation with the instructor and the TA is encouraged.

The report is limited to no more than 6 (double spaced font 12), single sided 8 1/2 by 11 format, submitted as a digital **Word 2010 or more recent** files by 04/28/2019 at midnight. A good minimum is 5 pages (These limits do not include title, reference, appendix and summary pages). Extensive data should be placed in an Appendix beyond the regular pages.

The report must include:

- A cover page with name, title and summary not to exceed the page
- Text containing definition, development of the topic, analysis and conclusions
- References (books and articles): title, author, publication, date, volume and pages

The project is required. If you do not turn them in by the final, you will receive an F for the class.
Details for the projects are at the end of this syllabus.

Approximate Course Outline:

Session	Date (example)	Material	Homework No. due
01	01/08	Introduction and Organization	
02	01/10	Supply Chain overview - Chopra Chapter. 1	
03	01/15	Project definition	No. 1
04	01/17	Chopra Chapter 2 – Performance	
05	01/22	Chopra Chapter 3 – Drivers	No. 2
06	01/24	Chopra Chapter 4 – Design	
07	01/29	Chopra Chapter 4 – Design	No. 3
08	01/31	Chopra – Network Models	
09	02/05	Chopra – Network Models	No. 4
10	02/07	Chopra – Network Models	
11	02/12	Review	No. 5
12	02/14	Midterm 1	
13	02/19	Chopra Chapter 6 – Uncertainty	No. 6
14	02/21	Chopra Chapter 6 – Uncertainty	
15	02/26	Chapter 12 Introduction to Inventory	No. 7
16	02/28	Chapter 12 Introduction to Inventory Chopra	
17	03/05	Chapter 14 Transportation	No. 8
18	03/07	Chapter 14 Transportation	
19	03/19	Review	
20	03/21	Midterm 2	
21	03/26	Chapter 14 Transportation	No. 9
22	03/28	Chopra Chapter 15 – Sourcing	
23	04/02	Chopra Chapter 15 – Sourcing	
24	04/04	Project update	
25	04/09	Chopra Chapter 15 – Sourcing	No. 10
26	04/11	Chapter 16 Pricing	
27	04/16	Chapter 16 Pricing	No. 11
28	04/18	Chapter 16 Pricing	
29	04/23	Project update	No. 12
30	04/25	Review	
Final	05/07 8 – 10 A.M.	Final	

ALWAYS BE SURE TO GIVE THE SOURCE OF ALL YOUR INFORMATION. ANYTHING TAKEN VERBATIM FROM SOMEONE ELSE MUST BE IN QUOTATION MARKS AND REFERENCED. (This includes partial sentences!)

This is intended to be an interactive class and your participation should increase as the semester progresses. Attendance at **all** classes for the **whole** class is expected of everyone. Frequent absences will result in a reduction in grade. Punctuality is expected. If you are late, be sure not to disturb the class as you enter. The use of iPhones, laptops, iPads or similar devices in class is strongly discouraged.

PLEASE DO NOT BRING FOOD OR DRINKS TO THE CLASS. BEVERAGES IN PLASTIC CONTAINERS ARE OK. NEATNESS, SPELLING, AND GRAMMAR COUNT. THEY ARE AN EXPRESSION OF YOUR COMMITMENT TO DO A GOOD JOB. USE THE TOOLS IN WORD AND EXCEL!

Laboratory Schedule (Attendance is Mandatory)

Session	Lab Material	Date
1	Lab Introduction, ArcView Lab 1	01/14
2	Excel Functions	01/21
3	ArcView GIS Lab 2	01/28
4	Excel – Solver, VBA	02/04
5	ArcView GIS Lab 3, VBA	02/11
6	ArcView GIS Lab 4	02/18
7	ArcView GIS Answer and Questions	02/25
8	Project time	03/04
9	Excel –Functions	03/25
10	ArcView GIS Lab 5	04/01
11	Project time	04/08
12	ArcView GIS Lab 6	04/15
13	Project time	04/22

Project

You can use the teams you had for the homework to date, or form new ones. Everyone must be on a team.

Grading

Both project grades will be divided into five categories:

1. Executive Summary 15%
2. Peer evaluation 10%
3. Technical Accuracy and Completeness 30%
4. Creativity in Method and Solution 30%
5. Organization of report as a whole 15%

The project grade will be a weighted average of the grades for the separate elements.

A single group grade will be assigned for elements 3 - 5. The executive summary and peer evaluation grade will be assigned on an individual basis, and each person in the group should turn in his/her own executive summary and peer evaluation. Team members should not collaborate at all on their executive summaries. These will be graded on the basis of quality of writing, clarity and organization. Team members should also not collaborate on the peer evaluation. If you rate everyone the same, you will lose part of the credit for doing the peer evaluation.

The technical accuracy grade will depend on the use of methods learned in class, errors in analysis, and whether the analysis was complete. A project will be graded down if there are omissions, mistakes in the application of methods, or application of inappropriate methods.

The creativity grade will be based on the uniqueness of the approach and the solution, as well as the quality of the solution obtained. The projects do not have a single right answer. It is important to be innovative in your method and in the development of your solution and to use what you learned in class.

Project Elements

The project will include the following elements

1) Executive Summary (1 page, double-spaced, 12 point text, 1" margins)

The executive summary shall provide the essential results of the project. It will include in this order:

a) Recommendations: recommended course of action and financials for the client
b) Overview: description of problem addressed and why
c) Methodology: description of the method used in the analysis
d) Alternatives: description of alternatives that were investigated
e) Results: summarized numerical results from the analysis of alternatives

2) Body of Paper

The body of the paper should elaborate on the executive summary. It should include, at a minimum:

- detailed description of the methods used, with example calculations
- detailed description of each alternative investigated, and the analysis of the alternative
- References

3) Appendix

Lengthy numerical analyses should be placed in the appendix and appropriately labeled.

4) Peer Evaluation

The format is up to you, but you must rate all your teammates on a scale of 1 - 10. You can explain your ratings, but do not have to.

Topics

The project is similar to the case study at the end of chapter 5 of the Chopra book. That study gave you the demand and shipping costs and the locations of the distribution centers. It also specified the product. The differences between the project and the case study are that you have to select your own product, generate your own demand (census data, Arcview, etc.), extended for six years (from 2019 through 2024). You should also use transportation cost and distances that are based on some research on your part. The location and cost of the distribution centers (both storage and fixed costs) should be reasonable and be the result of thorough analysis.
Use the given numbers for demand as a starting point and adjust them according to your product, demographics that you deem important and for economic factors.
The report should give a good indication of the finances of the company and take into account the time value of money and the effects of inflation and taxes (federal and local), as well as the time required to establish distribution centers. You should include the cost of materials and the income earned from sales.
It is your project – look at it as if you were the owner or owners of the company.
Give the sources of your research.
Be careful to structure the amount of work you do for the project with the amount of time you have available.
It is also helpful to establish roles and responsibilities for each of the team members.Most importantly, note that:

The project is due on 04/28/2018 at midnight. There will absolutely be no extensions – so act accordingly.

Last, but most important:

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086 Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime. Provides overall safety to USC community. dps.usc.edu