

Inventory and Supply Chain Systems

EIN4343 1G13

Spring 2020

M, W, F | Period 8 (3:00 PM - 3:50 PM) WEIM 1094

Instructor

Dr. Mengyu Li

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Teaching Assistant

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Course Description

Deterministic and stochastic inventory models for single- and multiple-item systems. Analysis and design of logistics systems. Supply chain management and coordination. Demand forecasting.

Course Pre-Requisites / Co-Requisites

ESI3312 (Operations Research 1) and ESI4313 (Operations Research 2) with minimum grades of C.

Course Objectives

This course develops student's analytic abilities to formulate and solve inventory, logistics and supply chain problems faced by today's firms. Students learn to take a comprehensive view of complex inventory and supply chain systems. Additionally, the students develop abilities to model, optimize, and design such systems.

Materials and Supply Fees

N/A

Professional Component (ABET)

This course contributes to the following PEOs:

1. Can become successful professionals in industrial and systems engineering or other disciplines
2. Can acquire advanced knowledge through continuing education or advanced degree programs

Relation to Program Outcomes (ABET)

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	Medium
3. An ability to communicate effectively with a range of audiences.	
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	Low
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives	
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	Low
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

- Textbooks
 - N/A
- Lecture Notes
 - Available at Canvas course site
- Supplemental Reading
 - Throughout the semester a number of essays/articles from contemporary business literature will be posted on the course website that you will be asked to read for follow-up class discussions.

Recommended Materials

N/A

Course Schedule

This is a *tentative* outline. The instructor reserves the right to make changes as she sees necessary.

Week	Date	Topic	Activity
1	Jan 6, 8, 10	Motivation, Syllabus & Inventory Management: ABC Analysis	
2	Jan 13, 15, 17	Inventory Management: Deterministic Models Economic Order Quantity (EOQ) Model & EOQ Extensions I	I AM 1
3	Jan 24	Inventory Management: Deterministic Models - EOQ Extensions II Jan 20 - Holiday - No Class Jan 22 - UF Career Fair - No Class	Quiz 1 (Jan 24)
4	Jan 27, 29, 31	Inventory Management: Deterministic Models EOQ Extensions III & Wagner-Whitin Model	Quiz 2 (Jan 31)
5	Feb 3, 5, 7	Inventory Management: Deterministic Models - Heuristics Inventory Management: Stochastic Models - Periodic Review Single-period model (cost minimization & profit maximization)	Price Research
6	Feb 10, 12, 14	Inventory Management: Stochastic Models Periodic Review: Multi-period with Backlogging & with Lost Sales Feb 12 - Term Exam 1 - In Class	Term Exam 1
7	Feb 17, 19, 21	Inventory Management: Stochastic Models Continuous Review: Multi-period with Backlogging & with Lost Sales	Quiz 3 (Feb 21)
8	Feb 24, 26, 28	Inventory Management: Stochastic Models Continuous Review: Service Levels	Quiz 4 (Feb 28)
9	Mar 2, 4, 6	Spring Break - No Class	
10	Mar 9, 11, 13	Logistics Management: Preliminaries, Shipment Mode & Size Selection, and Network Design	Quiz 5 (Mar 13)
11	Mar 16, 18, 20	Logistics Management: Consolidation & International Considerations	Quiz 6 (Mar 20)
12	Mar 23, 25, 27	Supply Chain Management: Definition and Fundamental Issues Mar 25 - Term Exam 2 - In Class	Term Exam 2
13	Mar 30, Apr 1, 3	Supply Chain Management: The Bullwhip Effect and Contemporary Issues	Company Research
14	Apr 6, 8, 10	Demand Forecasting: Preliminaries and Forecasting Error & Methods for Stationary Series	
15	Apr 13, 15, 17	Demand Forecasting: Methods for Linear Trend Series and Methods for Seasonal Series	I AM 2
16	Apr 20, 22, 24	Demand Forecasting - Practical Considerations Apr 24 - Reading Days - No Class	I AM Reflection
	Apr 29	Final Exam (Tentative) - 7:30-9:30am	

Attendance Policy, Class Expectations, and Make-Up Policy

Throughout the semester, following policies will be followed:

- **Class.** Students will be provided with detailed lecture notes. Attendance is not required. However, make sure you attend the classes when the quizzes/term exams are given (see detailed Course Schedule). Cell Phones **MUST** be turned off or placed on a silent mode before you come to class. You will not be allowed to check e-mail, send

text messages, and/or play games during classes. Please come to class in time. Late arrivals as well as walking out and in during the lectures disrupt the flow of the class. Persistent disruptive behavior will not be tolerated and might result in grade deductions (half a letter grade).

- **Exam Policy.** To assess student learning, students will be given six Quizzes (see detailed Course Schedule), two Term Exams (see detailed Course Schedule) and a comprehensive Final Exam (on April 29, 2020 at 7:30-9:30am (Tentative)). Formula sheets that can be used during the exams will be provided by the instructor. These formula sheets will be posted on the course web-site in advance. Prior to each exam a study guide will also be provided by the instructor that lists the topics that will be covered in the exam. The exams are scheduled in advance, please plan accordingly. Make-up tests will be given for unanticipated absences ONLY (e.g., illness/death in family with appropriate documentation, but NOT for job interviews). Exam Policy is non-negotiable. Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.
- **Regrade Requests.** Requests for regrading of exams will be considered only with a written explanation and only within a one-week period from the time graded work is returned in class. Specifically, you need to prepare a typed up or legibly written memo explaining why you believe your work needs to be regraded, attach it to the cover sheet of the exam booklet, and return it to the instructor or the TA. Grades will be posted on the course page on Canvas. Throughout the semester, you have to ensure that your grades are entered correctly. Corrections will be considered only within a one-week period after the grades have been posted on Canvas.
- **Announcements and Course Materials.** You are responsible for all announcements made in class as well as some additional material that might be covered. You are responsible for printing the lecture notes posted on Canvas. Paper copies of the lecture notes will not be distributed in class.
- **Price Comparison.** You will be asked to choose a product and create a table that depicts the price of the product for at least five different physical stores in Gainesville and at least three on-line stores (minimum required Amazon.com, Walmart.com, Target.com) businesses due on **February 7, 2020**. More information will be provided via Canvas.
- **Company Research.** You will be assigned a company and will be asked to conduct a company research about the supply chain practices as they pertain to pricing, inventory management and network design and operation practices of the company due on **April 3, 2020**. More information about the submission guidelines will be provided via Canvas.
- **Creative Writing Component.** To allow students to connect seemingly two disparate areas, creative writing and engineering in this semester, the students will be given a number of creative writing assignments throughout the semester.
 1. *Poem 1.* Write an "I am" poem about yourself due on **January 15, 2020** (Week 2 of the semester).
 - I am (two special characteristics)
 - I wonder (something you are actually curious about)
 - I hear (an imaginary sound)
 - I see (an imaginary sight)
 - I want (an actual desire)
 - I am (the first line of the poem restated)
 - I pretend (something you pretend to do)
 - I feel (a feeling about something imaginary)
 - I touch (an imaginary touch)
 - I worry (something that really bothers you)
 - I cry (something that makes you very sad)
 - I am (the first line of the poem repeated)
 - I understand (something you know is true)
 - I say (something you believe in)
 - I dream (something you actually dream about)
 - I try (something you make an effort to do)
 - I hope (something you actually hope for)
 - I am (the first line of the poem repeated)
 2. *Poem 2.* Write an "I am" poem on a topic, concept, model, issue, company, etc. related to course content due on **April 17, 2020** (Week 15 of the semester). For this assignment, you may change the verbs as you see fit.

Do not say what the topic, concept, model, issue, company, etc. in the title or the body of the poem until the very last line.

- I am (two special characteristics)
- I wonder (something you are actually curious about)
- I hear (an imaginary sound)
- I see (an imaginary sight)
- I want (an actual desire)
- I am (the first line of the poem restated)
- I pretend (something you pretend to do)
- I feel (a feeling about something imaginary)
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- I worry (something that really bothers you)
- I cry (something that makes you very sad)
- I am (the first line of the poem repeated)
- I understand (something you know is true)
- I say (something you believe in)
- I dream (something you actually dream about)
- I try (something you make an effort to do)
- I hope (something you actually hope for)

I am (the topic/concept/model/issue/company)

3. *Creative Writing Reflection.* You will be asked to reflect on the assignments that require you to combine creative writing and engineering. Three questions will be provided via a Qualtrics survey that will be made available via Canvas in Week 16 of the semester.

Evaluation of Grades

Your final grade for the class will be calculated as shown in the table below:

Quizzes (4 out of 6)	6%
Term Exam 1	28%
Term Exam 2	28%
Final Exam	32%
Creative Writing (1% Poem 1, 1% Poem 2, 1% Reflection)	3%
Price Research	1.5%
Company Research	1.5%

Grading Policy

Final grade averages will be rounded off to the nearest integer, and assigned on the standard scale as follows:

Percent	Grade	Grade Points
93 - 100	A	4.00
90.0 – 92.9	A-	3.67
86 - 89.9	B+	3.33
83 – 85.9	B	3.00
80.0 – 82.9	B-	2.67
76 - 79.9	C+	2.33
73 – 75.9	C	2.00
70.0 – 72.9	C-	1.67
66 - 69.9	D+	1.33
63 – 66.9	D	1.00
60.0 – 62.9	D-	0.67
0 - 59.9	E	0.00

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or the TA in this class. *All cases will be handed over to the Dean of Students.*

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a

member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <http://www.counseling.ufl.edu/cwc>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.ufl.edu/>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process>.