

INEG 5623 – Analysis of Inventory Systems

Instructor

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Course Description

“Elements of production and inventory control, economic lot size models, price break models, models using Lagrangian method, deterministic dynamic inventory model, probabilistic one-period and multi-period models, zero and positive lead time models, continuous review models. Pre-requisite: INEG 5313”-UofA Catalog of Studies.

Some ability to program in a general-purpose language such as “C”, VB, or Java is assumed. Familiarity with spreadsheets and other office productivity software is assumed. Some knowledge of optimization techniques is assumed. Knowledge of Engineering Statistics is assumed. Some knowledge of Production Planning and Control is assumed.

Course Outcomes

By the end of this course, the student should be able to:

- 1) Solve practical problems related to the analysis and control of inventory within the firm using standard deterministic and stochastic models
- 2) Understand, explain, and derive fundamental theoretical results related to inventory models
- 3) Understand, explain, and simulate the major elements, methods, and dynamic operation of inventory systems
- 4) Identify, discuss, and implement important research topics within inventory systems

Text and References

J. A. Muckstadt and Sapra, A. (2010) Principles of Inventory Management: When you are down to four, order more. Springer.

Additional journal papers and handouts may be used to supplement the text readings on particular topics of interest.

Topic Outline

Topic	Readings	#Lectures
Introduction	Chapter 1	1
Basic Deterministic Models	Chapter 2	3
Power of 2 Policies	Chapter 3	3
Dynamic Lot-Sizing with Deterministic Demand	Chapter 4	3
MRP/DRP Systems	Handout	2
Single Period Models	Chapter 5	2
The Base Stock Model	Chapter 7	3
The (r, Q) Model	Chapter 9	4
The (R, S), (R,s, S) and (s, S) Models	Handouts	4
The METRIC System	Chapter 8	3
Multi-echelon inventory systems	Handouts	2
Forecasting	Handouts	2
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Email and Web Page

A web course page has been established for this course on UA's Blackboard system: learn.uark.edu
I will use email and discussion lists within the course. You are responsible for logging into and working with Blackboard on a regular basis.

Weather Policy

Unless conditions require the University to close, students should make every attempt to get to class within the bounds of their personal safety. For information concerning the University's weather related closings see: <http://emergency.uark.edu/14701.php> I will make every attempt to post a message to Blackboard and/or to student email concerning the cancellation of class. Your responsibility is to check for such messages to the best of your ability.

Grading and Assignments

Textbook reading assignments are indicated in the course topic outlined below. Each student is expected to have read the material **before** the class in which it will be discussed. The grade for this course will be based on the following:

Homework	80%	Graduate students	
Term paper	20%	[100 – 90%]	A
Total	100%	(90 – 80%)	B
		(80 – 70%)	C
		(70 – 60%)	D
		(60 -]	F

Permitted Collaboration:

- **Homework:** You may *discuss and compare* your homework with other students in the class. Asking a fellow student: What approach did you take? What kind of answers did you get? Talking about logic, how formulas work, etc are okay. But be careful not to collaborate so much that there will be no distinguishable difference between your work and another student's work. You must do your own write up, programs, models, etc. The physical sharing of models, write ups, programs, etc is strictly prohibited. You must list the names of any students that you discussed your work with on the front cover of your assignment. If a problem is marked "individual" then you may not collaborate on the problem; otherwise, you are free to learn from each other as much as possible.
- **Term Paper:** You will be expected to write a paper (10 pages) on a topic related to inventory management. More details will be provided during the course. The expectations of this paper are that it would be suitable for submission to the Industrial Engineering Research Conference.

Recommended homework problems will be assigned on a regular basis. I will make an attempt to discuss the homework assignments in class and you should be prepared to discuss the results of your homework with the class. I expect you to check your own comprehension of the material. If you do not understand the material, then it is your responsibility to seek assistance.

If you have any questions concerning a grade, see me **within one week** of the assignment's return. No grade will be revised after that time. Unless the proposed revision is immediately clear, you should submit a **typed explanation** for any grade revision.

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Code of Ethics

All work is to be pledged to the fact that you observed the College of Engineering's Policy on Academic Ethics during the completion of the work. All work should be turned in with a *typed* cover sheet that includes the following information:

Name:	ID#:
Course#:	Assignment#:
Pledge: See below for the appropriate pledge wording to insert	
Signature(s):	Date:

Individual Pledge (*Signed by student*):

On my honor as a University of Arkansas student, I have abided by the College of Engineering's Code of Ethics on this assignment.

When an assignment (homework, exam, case study, etc) is marked Individual, each person is ethically bound to work on the assignment alone. For assistance, an individual may contact the Teaching Assistant or the Instructor. Consultation with other students is considered an ethical violation in this instance. Assignments that are not pledged will be returned without a grade, and shall receive a grade of 0 if not returned within 24 hours pledged.