

MATH375

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Course Summary

Course : MATH375 **Title :** Inventory Models and Systems

Length of Course : 8

Prerequisites : MATH320 **Credit Hours :** 3

Description

Course Description: This course introduces students to the basic concepts and application of inventory management, its theory and practice. An understanding of the inventory management theory is essential to operations management, production planning and scheduling, and global supply and demand chain management. Inventory management is the heart of operations management in any industry. On upstream, it will dictate policies and procedures for procurement and material management. Its impact on downstream, especially in meeting the required service level, is a determinant factor in high service level which greatly impacts marketing and financial departments. In this course we introduce quantitative methods of optimal inventory management in the context of operations management, forecasting, BOM, MPS, and ERP.

Course Scope:

Successful completion of this course will provide you with a working knowledge of the principles of inventory managements, models, and systems. This course will enable you to develop inventory management models and solve it in a deterministic or probabilistic setting. You will be able to conduct statistical inferential analysis in any case of inventory analysis with the inclusion of uncertainty and element of chance. The course is designed for students who seek an understanding of how inventory models may be applied in dealing with real life business problems in addressing shortages, as well as obsolescence in stand-alone situations or in the context of operations management and global supply and demand chain. The content of this course is designed with emphasis on the proper use of inventory modeling and techniques and their implementation, in real life business, rather than on mathematical theories.

Objectives

After completing the course, the student should be able to:

- CO-1: Describe the concepts, principles, and processes of operations management in a general business setting.
- CO-2: Explain the benefits of forecasting and its role in inventory management.
- CO-3: Describe the role of MRP and ERP systems in an inventory management system and inventory management model.
- CO-4: Explain the objectives of inventory control and management.

- CO-5: Apply the A-B-C approach to Inventory Management problems.
 - CO-6: Use the basic EOQ model to solve inventory problems.
 - CO-7: Apply the economic production quantity model to solve typical problems.
 - CO-8: Analyze quantity discount modeled systems to gain insight into inventory systems.
 - CO-9: Apply reorder point models to solve typical problems.
 - CO-10: Perform sensitivity analyses on basic inventory quantities.
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Outline

Week 1: Operations Management

Learning Objective(s)

Pre CO-1

- Define operations management
- Identify the three major functional areas of organizations and describe how they interrelate
- Describe the operations function and the nature of the operations manager's job
- Summarize the two major aspects of process management
- Explain the key aspects of operations management decision making
- Briefly describe the historical evolution of operations management
- Characterize current trends in business that impact operations management.

Reading

Read and study Chapter 1

Read pages 1-38

View and study the PowerPoint presentation in the Lessons section of the classroom

Assignment(s)

Introduce yourself on the Introduction Forum.

Suggested Discussion and Review: Chapter 1

Discussion and Review

Questions (p 1-38).

Week 2: Forecasting

Learning Objective(s)

Pre CO-1

- The elements of a good forecast.
- Outline the steps in the forecasting process.
- Compare and contrast qualitative and quantitative approaches to forecasting.
- Averaging techniques, trend and seasonal techniques, and regression analysis, and solve typical problems.
- Measures of forecast accuracy.
- Assess the major factors and trade-offs to consider when choosing a forecasting technique.

Reading

Read and study Chapter 3

View and study the PowerPoint presentation in the Lessons section of the classroom

Assignment(s)

Suggested Discussion and
Review: Chapter 3

Discussion and Review
Questions (p 72-130).

Complete Forum 2.

Week 3: MRP and MPS

Learning Objective(s)

Pre CO-1

- Describe the conditions under which MRP is most appropriate.
- Describe the inputs, outputs, and nature of MRP processing.
- Explain how requirements in a master production schedule are translated into material requirements for lower-level items.
- Discuss the benefits and requirements of MRP.
- Explain how an MRP system is useful in capacity Requirements planning.
- Outline the potential benefits and some of the difficulties users have encountered with MRP.
- Describe MRP II and its benefits.
- Describe ERP, what it provides, and its hidden costs.

Reading

Read and study Chapter 12
Pages 508- 552

View and study the PowerPoint presentation in the Lessons section of the classroom

Assignment(s)

Suggested Discussion and
Review: Chapter 1

Discussion and Review Questions (p508-552).

Complete Forum 3.

Week 4: Inventory Control Management and A-B-C Approach

Learning Objective(s)

CO-1, CO-2

- Explain the objectives of inventory control and management.
- Explain the Use of
A-B-C approach.

Reading

Read and study Chapter 13
Pages 554 – 562

View and study the PowerPoint presentation in the Lessons section of the classroom

Assignment(s)

Suggested Discussion and Review: Chapter 13

Discussion and Review
Questions (p554-594).

Complete Forum 4

Complete Quiz 1 in
McGraw-Hill Connect

Week 5: EOQ Model and Midterm

Learning Objective(s)

CO-3, CO-4, CO-6

-Describe the basic EOQ and EPQ models –its assumptions and use to solve inventory problems
-Use the economic production quantity
to model to solve
typical inventory problems

Reading

Read and study Chapter 1, 3, 12 and chapter 13 through page 566

View and study the PowerPoint presentation in the Lessons section of the classroom

Assignment(s)

Suggested Discussion and Review: Chapters 1,3,12 and 13

Complete Forum 5

Complete Midterm exam in McGraw-Hill Connect

Suggested Practice Problems: Complete the following in the Chapters 1,3,12, and 13 (pages 554-566)
Review Exercises

Week 6: Quantity Discount Models

Learning Objective(s)

CO-5, CO-8

-Employ the quantity discount model to gain insight into inventory analysis

Reading

Read and study Chapter 13, pages 566 - 574

View and study the PowerPoint presentation in the Lessons section of the classroom

Assignment(s)

Suggested Discussion and Review: Chapter 13

Discussion and Review Questions (p556-574).

Complete Forum 6

Complete Quiz 2 in
McGraw-Hill Connect

Week 7: Reorder Point Models

Learning Objective(s)

CO-9, CO-10

-Apply Reorder Point models
-Perform sensitivity
analysis on inventory quantities

Reading

Read and study Chapter 13
Page 566 – 95

View and study the PowerPoint presentation in the Lessons section of the classroom

Assignment(s)

Suggested Discussion and Review: Chapter 13

Discussion and Review Questions (p556-595).

Complete Forum 7

Complete Quiz 3 in
McGraw-Hill Connect

Complete the following in the Chapter 13 Review
Exercises (p595): 1-9

Week 8: Course Review and Final Examination

Learning Objective(s)

CO-1 to CO-10

Reading

Review Chapters 1, 3, 12, and 13 (pages 556-590)

Assignment(s)

Suggested Discussion and Review: Chapter 13

Discussion and Review Questions (p556-590).

Complete Forum 8.

Complete Final Exam in McGraw-Hill Connect.

Evaluation

Staying on task and adhering to the published schedule are typically among the most challenging aspects of completing an academic course successfully. This is especially true for online programs. To avoid the pitfall of falling behind, students in this course should complete all assigned activities each week. Student grades for the course will be based on class participation in the Forums, three graded quizzes, a midterm exam, and a final exam.

Class Participation: Naturally, I value punctuality, familiarity with the required readings, and classroom questions or comments that are relevant and insightful. Whether helping someone understand a point, seeking clarification of a concept you may not completely understand, or contributing to the positive flow of the class discussion based on your experience, it is important for you to realize that learning is an action process—and sharing is a key ingredient in undertaking that process successfully. Therefore, I urge you to participate actively and do your best to contribute to a positive and effective learning environment—for yourself and others.

I urge you to utilize the Question and Answer Forum as a means to interact with your classmates. If while working through examples or problems from our textbook you have a question or a comment, please post the question or comment in the Question and Answer Forum. Naturally, I hope that question and answers posted in the Question and Answer Forum will facilitate interactions among the members of our class.

Additionally, during weeks 1-8, I will pose a question within Forums. In weeks 1, 2 and 3, the Forum will be counted 5% each. It is imperative for you to answer the each of the questions. You are required to respond to these questions by making a post on the Forum by 11:55PM Eastern Time on Thursday during the week in which the question is posed. I will evaluate your responses to each of these questions using a 10 point scale, and your contribution to each of these five Forums will count as 5 percent of the overall course grade, for the first 3 Forums and 2% each for the last 5 Forums. Keep in mind that you need not necessarily answer a question correctly to earn full credit for your post. My evaluation will be based on the extent to which you participated and fostered a positive and effective learning environment—for yourself and others.

Participating and sharing are the keys. Collectively, I'm confident that we will derive the correct response to each of these discussion questions. To make a post to a Forum, click on the Forum topic link, and then click Post New Thread. In the title block of the dialog box that appears kindly insert your first and last name; compose your post in the message box; and then click Post Message. I will post the answers to these discussion questions by making a post myself after the Thursday 11:55PM Eastern Time deadline. At that time the Forum will be locked and no additional posts will be permitted. Naturally, I urge you to read my solution post, the posts of your classmates, and the feedback I provide. If you wish to continue to discuss a the question posed in a forum that has been locked, you can certainly do so by using the Message tool or the Q&A Forum to interact with the other members of our course.

The Week 1 Introduction Forum: During the first week of class each student must make a post to the Week 1 Introduction Forum. You are to use this Forum to introduce yourself and state your goals and objectives as they relate to our course. You are required to make a post to the Week 1 Introduction Forum in order to complete your enrollment in the course. Your post must be at least 250 words, and you must complete it by the end of the first week. This is a university requirement. To make a post to the Week 1 Introduction Forum, click on the Forum topic link, and then click Post New Thread. In the title block of the dialog box that appears kindly insert your first and last name; compose your post in the message box; and then click Post Message.

Besides completing your enrollment in the course, the Week 1 Introduction Forum is designed to 1) build

peer-to-peer relationships by introducing oneself and one's background to the class; 2) to articulate individual student learning goals and/or expectations for the class. Therefore, in your introduction you may wish to touch upon the following:

1. Who you are and how you would like to be addressed.
2. Your academic major or program of study.
3. Your current status in your program of study.
4. Your academic goals including why you are taking this course and what you hope to achieve by completing it.
5. Other information about yourself that you would like to share and might help others to know you better.

Naturally, I will review every post made to the Week 1 Introduction Forum and award 2 percentage points of extra credit to every student making a post that promotes the aim of building peer-to-peer relationships and articulates one's learning goals and aspirations with respect to our course. This will be the only extra credit provided in our course.

Quizzes and Examinations: The three graded quiz assignments are dispersed throughout the course. Each quiz will count as 10% of the course grade; the midterm will be counted 20%. The final exam will account for 25% of the course grade. Generally, the exams and quizzes will contain problems similar to those discussed in the suggested homework problems and the many examples given in our textbook. However, you should expect to be challenged by the graded exercises. Exams and quizzes will be conducted as indicated on the course schedule and students are expected to complete them on time. No late submissions will be accepted.

Specific instructions will be provided for each examination and quiz in the Lessons section of our classroom at the outset of the week in which these graded exercises are due. Each of these graded exercises is to be completed on an individual basis in Math Connect. You may consult published textbooks, articles, and other printed materials.

No collaboration is permitted on the examinations or quizzes. You are not to discuss, orally, in print—in any manner—any aspect of the graded exercises with anyone other than your instructor. Clearly, student-teacher relationships are built on trust. This is especially true in the case of an online course.

At the beginning of the week in which they are due, exams and quizzes will be posted in the Connect link in your classroom. When you are prepared to take an assessment go to Connect and click on the assessment. With the exception of the Final Exam, which is a 3 hour timed exam, all other graded assessments have no time limit. It is important for you to understand that you will be able to submit your answers to an assessment only once. Your answers must be submitted by the 11:55PM Eastern Time deadline, as indicated in the syllabus. I will not accept late submissions. So, please don't wait until the last minute to submit your answers to a quiz or exam. As soon as you submit your answers your assessment will be graded, and your score will be recorded in the Gradebook. Twenty-four hours after the deadline and once everyone has submitted their answers, you can access the feedback by clicking on the assessment in the Tests & Quizzes section of our classroom. Naturally, if you answer any of the questions on an assessment incorrectly I urge you to review the feedback and reconcile any errors you may have made on a quiz or exam.

The Final Examination will be counted as 25% of the total grade. It will be a three hour, online, open-book, open-note exam. The final exam will cover all of the material presented during our course. You will be able to access the Final Exam only once. So, be sure to set aside a dedicated three hour period in which to complete it. You may not consult with any other person while taking the exam.

The notations used in mathematical work aren't found in many word processing programs, making it difficult to produce many of the symbols used in our course. You may wish to use the Symbol font in Microsoft Word and the Insert/Object/Microsoft Equation feature in Word when preparing documents related to our course. Insert/Symbol is also sometimes useful. Of course, you will also want to familiarize yourself with the Insert/Edit Equation feature contained in the Rich Text Editor that is available in the Rich Text Editor toolbar in our classroom. Additionally, since many of the computations and analyses required in our course can be easily carried out using Microsoft Excel, you may wish to familiarize yourself with the process whereby Excel outputs can be copied and pasted into a Word or pdf file.

Additionally, as noted above, 2 percentage points of extra credit will be awarded to every student making a proper post to the Week 1 Introduction Forum.

Students' final grades will be posted within 7 days of the end of the semester. Please see the [Student Handbook](#) to reference the University's [grading scale](#).

Grades for the course will be based on the following.

Grading:

Name	Grade %
Introduction Forum	2.00 %
Introduction Forum	2.00 %
Forums	25.00 %
Forum 1	5.00 %
APUS Honor Code and Pledge	1.25 %
Forum 2	5.00 %
Forum 3	5.00 %
Forum 4	2.00 %
Forum 5	2.00 %
Forum 6	2.00 %
Forum 7	2.00 %
Forum 8	2.00 %
Quiz	30.00 %
Quiz 1	10.00 %
Quiz 2	10.00 %
Quiz 3	10.00 %
Midterm	20.00 %
Mid Term Exam	20.00 %
Final Exam	25.00 %
Final Exam	25.00 %

Materials

Book Title: Operations Management, 11th ed - The VitalSource e-book is provided via the APUS Bookstore

Author: Stevenson, William

Publication Info: McGraw-Hill

ISBN: 9781308304557

Book Title: You must validate your cart to get access to your VitalSource e-book(s). If needed, instructions are available here - <http://apus.libguides.com/bookstore/undergraduate>

Author: N/A

Publication Info: N/A

ISBN: N/A

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The e-book version of our text can be accessed directly at the following URL, which you may want to copy and add as a bookmark in your browser.

http://ebooks.apus.edu/MATH375/Stevenson_2010.html

The e-book is provided in Flash format, and Adobe Flash Player is required. This software is a free download at www.adobe.com. The e-book may be viewed online or printed. To learn more about how to use the e-book, you may want to view the Video Tutorial for using this e-book, which can be found at <http://mhlearningsolutions.com/apr/AmericanPublicUnivSystemeBook/eBookwalkthrough.html>

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We will utilize Excel to perform many of the computations in our course. Microsoft Excel is required for this course. Students should have a basic familiarity with Excel and must have access to this software application.

All quizzes, tests and assignments will be in McGraw-Hill Connect.

Course Guidelines

Citation and Reference Style

- Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

- Tutor.com offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

- Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.
- Generally speaking, late work may result in a deduction up to 15% of the grade for each day late, not to exceed 5 days.
- As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

- Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the

Assignments area of the course.

Academic Dishonesty

- Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

- Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

- Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

- Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.
- “Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.
- As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

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