

INTER AMERICAN UNIVERSITY OF PUERTO RICO  
METROPOLITAN CAMPUS  
ECONOMICS AND ADMINISTRATIVE SCIENCES FACULTY  
MBA PROGRAM

**COURSE SYLLABUS**

**I. GENERAL INFORMATION**

COURSE TITLE	:	Production Planning and Control
CODE AND NUMBER	:	BADM-6130
CREDITS	:	Three (3)
ACADEMIC TERM	:	
PROFESSOR	:	
OFFICE HOURS	:	
OFFICE TELEPHONE	:	
ELECTRONIC MAIL	:	

**II. DESCRIPTION**

Inventory theories, production models and programming, quality and cost control, design of production information and control systems. Admission to M.B.A. Program

**III.OBJECTIVES**

1. The student will understand the importance and how to manage inventories in a production and operation environment.
2. The student will understand the importance and how to perform production planning in a production and operation environment.
3. The student will understand the importance and how to perform scheduling in a production and operation environment.
4. The student will understand the role aggregate inventories related to the business cycle.
5. The student will be able to understand the relationship between the finance and marketing functions with inventory management, production planning and scheduling.
6. The student will understand the concept of replenishment in the context of an approximately level demand pattern.
7. The student will understand and will be able to forecast inventories using a quantitative deterministic method.
8. The student will understand the use of the Economic Order Quantity Model used with approximately level demand.

9. The student will understand the different inventory classes and how to control those inventories.
10. The student will understand the concept of aggregate production planning.
11. The student will understand the concept of Material Requirements Planning.
12. The student will understand the concept of Just-in-Time and Optimized Production Technology.
13. The student will review and will have an understanding of cost control and containment.
14. The importance and used of production information for control production costs and quality will be stressed along the entire course.

#### **IV. COURSE CONTENT**

1. Introduction to Inventory Management, Production Planning and Scheduling
  - a. Inventory fluctuations
  - b. Productivity and Performance of Existing Inventory Systems
  - c. Inventories within the industry
  - d. Current initiatives in Supply Chain Management
2. Strategic Elements
  - a. Corporate Strategy and the Role of Top Management
  - b. The Relationship of Finance and Marketing to Inventory Management and Production Planning and Scheduling.
  - c. Operations Strategy
  - d. Measures of Effectiveness for Inventory Management and Production Planning and Scheduling Decisions
3. Supply Chain Management
  - a. Elements and effects on inventory management
4. Forecasting
  - a. Review of forecasting techniques
    - i. Naïve
    - ii. Moving Averages
    - iii. Weighted Moving Averages
    - iv. Exponential Smoothing
    - v. Double Exponential Smoothing
    - vi. Seasonality
    - vii. Linear Regression
  - b. Forecasting Error Analysis
    - i. MAD
    - ii. MSE
    - iii. Error Analysis
5. Enterprise Resource Planning
6. Frameworks for Inventory Management and Production Planning and Scheduling.
  - a. The different types of Stock Keeping Units
  - b. Types A,B,C of inventories

- c. Frameworks for managing inventory
  - d. Frameworks for managing production planning
  - e. Frameworks for managing for Scheduling
  - f. Costs
  - g. Explicit Measures of Costs
  - h. Implicit Measures of Costs
  - i. Exchange Curves
  - j. The Phases of a Major Inventory or Production Study
7. Economic Order Quantity (EOQ)
    - a. Basic Assumptions of the EOQ model
      - i. Model derivation
      - ii. Sensitivity Analysis
    - b. Discounts for Quantities
    - c. Inflation
    - d. Limit of Order Sizes
    - e. Economic Production Quantity
    - f. The Exchange Curve
  8. Lot Sizing for Individual Items with Time- Varying Demand
    - a. Time Varying Demand
    - b. Using an EOQ Fixed Model
    - c. Wagner-Whithin model for Optimal Solution
    - d. Heuristic Approaches for Dealing with Varying Demand Patterns
    - e. Managing Orders with Discounts
    - f. Aggregate Exchange Curves
  9. Individual Items with Probabilistic Demand
    - a. The Importance of the A,B,C Inventory Classification
    - b. Continuous versus Periodic Review
    - c. Inventory Control System
      - i. Ordering Point
      - ii. Order Size
      - iii. Level Orders
    - d. Specific Costs
      - i. Simple Safety Stock
      - ii. Safety Stock Based on Minimizing Costs
      - iii. Safety Stock Based on Customer Service
      - iv. Safety Stock Based on Overall Considerations
    - e. Rules for Finding the Reorder Point, the Order Point and Order Quantity
    - f. Implicit Costs
    - g. Performance Measures
    - h. Variations in Lead Time
    - i. Safety Stock Exchange Curves
  10. Managing Class A and Class B inventories
    - a. Reorder point
    - b. Economic Quantity
    - c. Managing Slow Moving Inventory
    - d. Intermittent Demand
    - e. Multiple Sources of Supply and Expediting
  11. Managing Class C inventory
    - a. Managing Items with Steady Demand

- b. Control of Items with Declining Demand Patterns
  - c. Reducing Excess Inventories
  - d. Stocking versus not Stocking and Item
- 12. Style Goods and Perishable Items
  - a. The Style Goods Problem
  - b. Forecasting and Restrictions
  - c. Replenishment
  - d. Liquidating Style Goods out of Style
  - e. Liquidating Perishable Goods near Expiration Date
- 13. An Overall Framework for Production Planning and Scheduling
  - a. Different Production Processes
  - b. Decision Making in Production
  - c. Hierarchy of Decisions
- 14. Medium-Range Aggregate Production Planning
  - a. The Problem of Medium-Range Aggregate Production Planning
  - b. Related Costs
  - c. Planning Horizon
  - d. Using Linear Programming
  - e. Strategy
    - i. Level
    - ii. Chase
  - f. Simulation
  - g. Planning for Adjustments due to Uncertainty
- 15. MRP
  - a. Multistage Assembly Manufacturing
  - b. Weakness of Traditional Replenishment System
  - c. Closed Loop MRP
  - d. MRP
  - e. Capacity Requirements Planning
  - f. Distribution Requirements Planning
  - g. Weakness of the MRP System
  - h. Enterprise Resource Planning(ERP)
- 16. Just-in-Time (JIT)
  - a. Planning and Scheduling in Repetitive Situations
  - b. Bottlenecks and Optimized Production Technology (OPT)
- 17. Short-Range Production Scheduling
  - a. Deterministic Scheduling of a Single Machine
    - Deterministic Scheduling of Two Machines

## **V. ACTIVITIES**

- a.** Lectures
- b.** Case Studies
- c.** Supplementary readings
- d.** Internet searches
- e.** Audiovisual Support: Powerpoint presentations, videos
- f.** Presentation and discussion of relevant academic journal or trade journal articles

## **VI. EVALUATION**

Required activities to achieve course objective should include various pedagogical activities such as, homework, presentations, short quizzes, partial examinations and interactive participation. It is highly recommended the utilization of the Blackboard platform as a support system for the course. Assessment techniques should be applied at professor discretion.

1. Students are expected to review prerequisite material as needed, and to read assignments and complete written exercises prior to the class session.
2. Students are required to actively participate in class discussions.
3. The student will be required to complete homework problems as a mean to practice the acquired practical knowledge in the classroom.
4. This course requires intense practice of quantitative exercises presented in class. Therefore it is important that student's complete all assigned text exercises and analysis before coming to the classroom. This is a way of acquiring practical knowledge in the classroom.
5. It is highly recommended the use of spreadsheets as a way of better solving the assigned problems. Furthermore it provides the student a way to situational analysis in a closer way to those used in the area of production and operations.

## **VII. SPECIAL NOTES**

### **A. Special Accommodations**

Students who require special accommodations must request these services at the beginning of the course as soon as they notice that they need help. Students can access this service with Professor Jose Rodriguez, Coordinator of Students with Special Needs at the Guidance and Counseling Office on the first floor at Metro's Student Center.

### **B. Plagiarism**

Plagiarism, dishonesty, fraud and any other type of manipulation or inappropriate behavior related with academic performance are unacceptable in our institution. Disciplinary actions will be taken on students found guilty of such practice as established in Chapter V, Article 1, Section B.2 of the Student's Rules and Regulations handbook.

**INTER AMERICAN UNIVERSITY HAS VERY STRICT REGULATIONS REGARDING PLAGIARISM (USING THE IDEAS OR WORDS OF OTHERS WITHOUT GIVING PROPER CREDIT), SO IT IS IMPORTANT THAT YOU SPECIFICALLY READ CHAPTER 5, ARTICLE 1, SECTION B.2C OF THE STUDENT' RULES AND REGULATIONS HANDBOOK. THIS**

SECTION CLEARLY EXPLAINS WHAT PLAGIARISM IS. IN ADDITION, IT EXPLAINS THE TYPES OF SANCTIONS STUDENTS ARE EXPOSED TO WHEN THEY COMMIT IT.

### C. USE OF ELECTRONIC DEVICES

CELLULAR (MOBILE) TELEPHONES AND ANY OTHER ELECTRONIC DEVICE THAT COULD INTERRUPT THE TEACHING-LEARNING PROCESS OR DISRUPT A MILIEU FAVORABLE FOR ACADEMIC EXCELLENCE WILL BE DEACTIVATED. CRITICAL SITUATIONS WILL BE DEALT WITH IN AN APPROPRIATE MANNER. THE USE OF ELECTRONIC DEVICES THAT PERMIT THE ACCESSING, STORING OR SENDING OF DATA DURING TESTS OR EXAMINATIONS IS PROHIBITED.

## VIII. RESOURCES

### a) Required Textbook

Vollmann, Thomas E., Berry, William L. & Whybark, D. Clay. *Manufacturing Planning and Control Systems* (Latest Ed.). Chicago: Irwin.

### b) Audiovisual and Information Technology

Campus On-line Services at - <http://cai.inter.edu/>

- ProQuest
- Infotrac (Database)
  - Business and Company Resource Center
  - General Business File Internacional
  - Expanded Academic ASAP

## IX. BIBLIOGRAPHY

Askin, Ronald G. & Goldberg, Jeffrey B. (2002). **Design and Analysis of Lean Production Systems**. New York: John Wiley and Sons.

Reid, R. Dan & Sanders, Nada R. (2009). **Operations Management and Integrated Approach**. (4<sup>th</sup>. Ed.) New York: John Wiley and Sons.

Silver, Edward A., Pyke, David F. & Peterson, Rein (1998). **Inventory Management and Production Planning and Scheduling**. (3rd. Ed.). New York: John Wiley and Sons.

Russell R.A. & Taylor, B.W. (2007). **Opertations Management** (5<sup>th</sup> Ed.). New York: Wiley and Sons.