IME 540 Production Control and Inventory Systems

Designation: Professional elective

Catalog Data: IME 540 Production Control and Inventory Systems (3) Theory and practice of industrial production control and inventory systems. A broad spectrum of mathematical models for static, dynamic, perpetual, and periodic inventory systems as they affect and relate to production. (Lec. 3) Pre: IME 432 or permission of instructor.

Textbook:

Factory Physics, 2nd Edition, Wallace J. Hopp and Mark L. Spearman, 2001, McGraw-Hill, ISBN #0-256-24795-1

Prerequisites by Topic:
1. Operations Research.
2. Calculus and Statistics.
3. Computer applications for industrial engineering, including Excel and computer programming.

Course Objectives:

Students completing this course will have:

Course Objective	Link to Curriculum Objective
1. An ability to assess a production environment and identify appropriate management techniques.	4
2. An ability to quantitatively analyze specific types of manufacturing engineering problems.	1, 2
3. An ability to understand the complex issues involved with planning a manufacturing system and the diverse human perspectives that must be considered.	4
4. An ability to describe current trends and practices in manufacturing.	7
5. An ability to evaluate the performance of different manufacturing systems from a factory physics perspective.	6
6. An ability to work together in a team to apply principles to a manufacturing system analysis case from industry.	9
7. An ability to demonstrate communication skills in class exercises.	14

Topics Covered:

1. Historical and Recent Trends in Manufacturing (2 classes)
2. Inventory Control Models including EOQ, Wagner-Whitin, News Vendor (Q,r), (3 classes)
3. MRP, ERP, and RFID or EDI systems for Inventory Management (2 classes)

4. Just-in-Time (JIT), Lean Manufacturing, and Pull Systems (3 classes)
5. Factory Dynamics and Variability (4 classes)
6. Shop Floor Control and Scheduling (2 classes)
7. Quality Control and SPC (2 classes)

Contribution to Professional Component:

Engineering Science: 1.5 credits or 50%
Engineering Design: 1.5 credits or 50%

Course Outcomes:

Program Outcome	Indicator
A. An ability to solve engineering problems by applying knowledge of mathematics and basic science	Homework, Exams
B. An ability to use modern computing tools and techniques to effectively solve industrial engineering problems	Homework, Project
E. An ability to analyze economic and financial data, leading to appropriate economic decisions	Homework
I. An ability to design, develop, implement and improve integrated systems that involve people, materials and energy.	Exams
J. An understanding of common manufacturing processes and their applications.	Homework
L. An in-depth knowledge in at least one area of interest related to industrial engineering	Final grade –course is professional elective for undergraduates.
M. An ability to take an assigned engineering problem, analyze it and formulate and implement a solution.	Project
N. An ability to effectively contribute to a team solution of a complex engineering problem.	Project, In Class Exercises
S. An ability to effectively communicate the reasoning behind specific engineering decisions.	Exams
T. An ability to present engineering information clearly and succinctly in written form.	Exams, Project
V. An ability to present and discuss diverse problems and ideas in group situations.	In Class Exercises

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