

**Course Outline of MBA 665: Manufacturing Planning and Control**  
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This course gives you an overview of staff function of the production area. It tells you how staff function applies various models of inventory planning, scheduling, large scale systems (as applicable to JIT, MRP, OPT and FMS), facility location and facility layout to help line managers (of the production function) in planning various activities. The core of this course is highly mathematical. However, this course will teach you not to be afraid of these mathematical equations and techniques; and use the implications of these theorems and proofs to work out a solution desired by us. This course helps you, the engineer manager, to develop the ability to understand what staff (of the production function) does and know what is possible and what is not. The M Tech students taking this course are encouraged to go in the depths of various topics covered as it will be helpful for their M TECH thesis.

### **REFERENCES**

1. Analysis of Inventory Systems, Hadley and Whitin, DB Taraporewallah Sons & Co Pvt Ltd., by arrangement with Prentice Hall, Inc, Bombay, 1979.
2. Inventory Control : Theory and Practice, MK Starr and DW Miller, PHI New Delhi 1990.
3. Introduction to theory of NP-completeness, Garey and Johnson.
4. Theory of Scheduling, RW Conway, WL Maxwell and LW Miller, Addison Wesley Publishing Co; LONDON, 1967.
5. Introduction to Sequencing and Scheduling, KR Baker, John Wiley & Sons, NY, 1970.
6. Scheduling, Theory, Algorithms & Systems, M Pinedo, PH, NY, 1995.
7. Operations Research in Production Scheduling and Inventory Control, LA Johnson and DL Montgomery, John Wiley & Sons, NY, 1974.
8. Planning Production, Inventories, and Work Force by Holt, Modigliani, Muth and Simon.
9. Cases in Production Operations Management, KN Krishnaswamy, PHI, New Delhi, 1998.

**Module on Inventory Planning & Control**  
**(7 sessions of 1.5 hours each)**

1. Revision of static inventory models, single item case (Ch1 and Ch2 of Book 1), multi item case (pp. 93-111 of Book 2) (M Tech students are supposed to read it by themselves). (1 session)
2. Wagner-Whitin model for the case of single item with dynamic demand. Paper will be supplied. (1 session)
3. Lot sizing under uncertainty. Following will be covered from Book 1, Ch4 (sections 4.1 to 4.4), Ch5 (sections 5.1 to 5.2), Ch6 (sections 6.1 to 6.3). (2 sessions)
4. Genetic algorithm for solving a lot sizing problem with shortage costs. (1 session). Presentation by instructor.

**Module on Scheduling**  
**(2 sessions of 1.5 hours each)**

NP Completeness, NP Hardness, Lagrangian Relaxation, Simulated Annealing, Tabu Search (1 session) : Presentation by instructor  
Some scheduling problems (2 sessions) : Presentation by instructor  
One paper (1 session) : Presentation by instructor

**Module on Aggregate Planning & Large Scale Systems**  
**(5 sessions of 1.5 hours each)**

1. Aggregate planning systems (1 session)
2. JIT (1 sessions) and MRP Systems (1 sessions)
3. Optimized Production Technology & Theory Of Constraints (1 session)
4. FMS (1 session)

**Module on Plant Location Problems**  
**(4 sessions of 1.5 hours each)**

1. Erlenkotter & Sharma & Murlidharan (1 session) (SPLP)
2. CPLP Shridharan's work (1 session)
3. V Berry & P Modi & S Namdeo (1 session) (LINGO Based assignments)

**Module on Plant Layout Problems**  
**(2 sessions of 1.5 hours each)**

1. Revision of earlier paper (Done in POMS Ist MBA).
2. Mathematical formulations (SP Singh and others) (LINGO Based assignments).

**Module on Project Management:  
4 sessions of 1.5 hours each.**

**(Book by Wiest and Levy)**

**CASES  
(4 sessions of 1.5 hours each)**

1. Case 7, Book 9, Material Control at HYPO
2. Case 2, Book 9, Machine utilization at Krishnan & Co.
3. Case 16, Book 9, Dazzle Lamps, Aggregate Production Planning.
4. Hewlett Packard Company : Desk jet Printer Supply Chain.

**Case Presentation**

Organize the class into 4 groups and take up any of the case listed. You are required to do the case analysis in group and submit a report and present the same in class and take questions from your fellow students.

**Term Paper**

Organize the class into 8 groups and each group takes up any of the following topics as term paper.

1. Flexibility measures
2. Hierarchical Production Planning (HPP)
3. Lot Sizing
4. Capacitated Production Planning Problem
5. Theory Of Constraints
6. Nervousness of MRP systems (3 papers)
7. Dis aggregation of aggregate production plans (ZOLLER)
8. JIT Literature review

Newer Topics are also available. Term papers will be presented in extra classes.

**Guidelines for writing a “TERM PAPER” report**

1. Give a summary of the paper. Outline major findings.
2. Relate the paper to at least 4 other papers that you have read (from the references). Give a summary of these papers also.
3. Relate paper to what has been covered in the class on similar topics.

## **Evaluation Scheme**

Mid Sem 1 : 30 points;  
Mid Sem 2 : 50 points  
End Sem : 20 points  
Case Presentation : 20 points  
Term Projects : 20 points