



Wollo University

Kombolcha Institute of Technology

Department Of Mechanical Engineering



Production planning and control-II course outline

Course number: IEng3122

Course title: production planning and control-II

Target group: 3rd year industrial students

ECTS: 5

Instructor: Moges M.

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Course Objectives & Competences to be Acquired

At the end of this course the students will be able to:

- ☐ manage inventory
- ☐ Plan requirement of material for any production or service operation
- ☐ schedule activities effectively

Course Description:

Production planning and control is concerned with all the functions necessary for the creation and delivery of goods and services in the business, public, and non-profit sectors. This course is an introduction to the design and control of production functions. The emphasis is on developing systematic approaches for identifying and resolving a variety of problems arising in production planning using methods from statistics, economics, operations research, and behavioral sciences.

Course Outline:

1. Inventory Management

Introduction to Inventory Management, Definition of Inventory Types and Function of Inventory, Costs of Inventory, Inventory Control Models, Independent Demand Systems Inventory Models and Deterministic (Model I- Economic Order Quantity , Model II- Production Order Quantity, Model III-Infinite input rate-backlogging allowed, Model IV-Finite input rate-backlogging allowed). Multiple item and Constraint Quantity Discount models (All units Discount, Incremental discount). Probabilistic models: Fixed Order and Fixed Time systems (The nature of randomness, Optimization criterion).

The Newsboy Model (Lot size—reorders point systems, Service levels in (Q, R) systems, Additional discussion of periodic—review systems, Probability distributions for inventory management, Multiproduct systems).

2. Material Requirement Planning

Introduction Independent Vs. dependent, demand Hierarchy of production planning decisions, MRP Systems--- input and output (MRP inputs Master production schedule, MPS Bill-of-material (product structure tree) BOM, Inventory status records MRP processing/explosion calculus) , MRP outputs (Planned order & other reports, Capacity planning capacity theory, rough-cut capacity planning, capacity requirements planning (CRP), MRP in services Benefits of MRP , Manufacturing resources planning MRP II).

3. Short term Scheduling

Strategic importance of short term scheduling, Scheduling Issues Forward and backward scheduling , Scheduling Criteria , Scheduling process- focused facilities , Loading Jobs, Sequencing Jobs , Priority rules for dispatching jobs, Critical Ratio, Sequencing N jobs on two machines, Limitations of rule based dispatching system , Finite capacity Scheduling , Theory of Constraints, Scheduling repetitive facilities, Scheduling services

4. Waiting line management

5. Lean Manufacturing

Reference	Pre-requisites: Production Planning and Control-I			
	Assessment/Evaluation & Grading System			
	Assignments	10%,		
	Plant tour report	15 %	Quiz	5%,
	Tests	20%	Final Examination	50%
- Chase, R. B., N. J. Aquilano, and F. R. Jacobs. Operations Management for Competitive Advantage. 11th Ed. Boston: Irwin/McGraw-Hill, Inc, 2006. - Nahmias, Steven, Production and Operations Analysis, Fifth Edition, McGraw-Hill Irwin (2005). - Adam, E.E. and Ebert, R.J., Production and Operations Management, Prentice Hall, NJ, (1993). - Buffa, E.S., Modern Production/Operations Management, Wiley, (1980 - 6-th ed.). - Schroeder, R.G., Operations Management: Decision Making in the Operations Function, McGraw Hill, (1993). - Production: Planning, Control, and Integration, by Daniel Sipper and Robert Bulfin, McGraw Hill, New York, NY (1997). - Decision Systems for Inventory Management and Production Control (3rd Edition), by Edward A. Silver, David F. Pyke and Rein Peterson, John Wiley, New York, N.Y. (1998).				