

IE 505 PRODUCTION PLANNING AND CONTROL
Description of Term Projects

Dr. R. Nagi

1. FORECASTING:

- Select a manufacturing or service industry
- Review the current forecasting method
- Identify the factors peculiar to this enterprise that are taken into account while forecasting (e.g. sales of houses for a paint enterprise forecasting).
- Critique the forecasting method
- If company is willing to part with data of one or more products, apply the forecasting techniques studied in the course, and evaluate the associated errors.
- Compile your recommendations on the technique the company should be employing; quantify benefits.

2. AGGREGATE PLANNING:

- Select a manufacturing enterprise having a wide product line
- Review the current (aggregate) planning method
- Identify the reasons for aggregating specific products into groups (e.g. common characteristics, common market, common resource utilization)
- Critique the aggregation scheme and planning method
- If the company is willing to part with data, or even data type (you can generate the numbers at random), develop the production planning problem and solve it using LINDO (or any LP solver)
- Compile your recommendations on the aggregation schemes, factors the company should consider, specific math-programming model, rolling horizon, etc. Anticipate benefits.

3. INVENTORY CONTROL (known demand):

- Select a manufacturing or service industry for which the demand is known (more or less)
- Review the current inventory control policy
- Critique the current policy and suggest alternatives
- Develop a simulation model or analytically evaluate the consequence of the alternatives (EOQ, JIT, and other random policies)
- Compile your recommendations and evaluate benefits.

4. INVENTORY CONTROL (stochastic demand):

- Select a manufacturing or service industry for which the demand is random
- Review the current inventory control policy
- Critique the current policy and suggest alternatives
- Develop a simulation model or analytically evaluate the consequence of the alternatives ((Q,R) and (s,S) policies with optimal parameters)
- Compile your recommendations (optimal policy/parameters) and evaluate benefits.

5. MATERIALS REQUIREMENTS PLANNING/ MANUFACTURING RESOURCES PLANNING (MRP II):

- Select a company with an MRP II system operating or being implemented
- Describe the company, product line and Bills-of-Material dimensions, frequency and type of MRP runs
- Discuss: (i) success and benefits, (ii) problems encountered initially, (iii) strategy employed for changeover from manual procedures
- Compile your recommendations and suggestions, with reference to benefits.

6. OPERATIONS SCHEDULING:

- Select a manufacturer of discrete parts (or job-shop type environment)
- Describe the company, products, routings, assembly structures (no data required)
- Critique the current operations scheduling policy
- Are there alternative scheduling rules that will be more beneficial? Study them via simulation or scheduling theory
- Compile your recommendations and quantify benefits.

7. PROJECT MANAGEMENT:

- Contact one of the contractors working in developing building estates or any other project type work
- Define his most critical project
- Develop a network chart (in precedence form) and perform
 - Time analysis
 - Bar charting and cash flow curves
 - Resource aggregation and scheduling (one or two resources)
 - Evaluation of resource schedules
 - You can use a PC-based software to perform your work (e.g. PACMICRO)

COMMENTS

- Literature search and association with an enterprise are absolute prerequisites.
- Computer programs (commercially available and/or self-developed) are highly recommended to be used.
- A substantial amount of self-motivation and initiative is required in order to:
 - define the exact problem
 - develop the appropriate model(s)
 - apply the right algorithms, methods, or tools (mathematical, heuristic, manual, computerized)
 - appraise your results and admit drawbacks
- I will give you directions but not solutions. GOOD LUCK!