

Midterm I Review Topics

This exam will be open Engineering Notebook, and closed text and homework. You should have a mechanical pencil, eraser, and a well-charged calculator to complete the exam. The exam will be 1 hour 45 minutes in length.

TOPICS

Strategic Planning for Facilities

- Strategic Planning vs. Tactical Planning
- Strategic impact of facilities

Product and Process Design

- Indented Bills of Material and cost roll-ups
- Operations Process Charts
 - (including standard symbols)
- Precedence Diagrams
- Basic PERT
 - Critical Path – Make Span Computation
 - Slack Time Computations

Flow and Space Relationships

- Types of Manufacturing Systems
 - Approximate volume characteristics
 - Equipment characteristics
 - Production characteristics
 - Layout characteristics
 - Skill characteristics
 - Product characteristics
- Relationship between Volume, Variety and Automation
- Estimating Production Volumes with Scrap (including **defects** cost)
 - Single station
 - Multiple, serial stations
 - Multiple stations with re-work
- Estimating Equipment Fractions
 - Adjusting for scrap and defectives – effective quota
 - Adjusting for length of available time – effective shift length
 - Adjusting for preventative maintenance – effective standard time
 - Adjusting for process improvements – effective efficiency
 - Replacing Reliability* with Availability
 - Adjusting for Failure (MTTF) and Repair (MTTR)
- Relating Machine Assignments, Cycle Times, and Total Costs
 - Ideal Assignment
 - Operator Idle
 - Machine Idle
- Difference Between Transient and Steady-State

Activity Relationships

Typical Layout Patterns for Variety and Volume mixes

Typical Flow Patterns (text)

Advantages

Disadvantages

Group Technology

Purpose

Matrix Construction

King Algorithm Steps

Matrix Partitioning

Non-Overlapping

Over-lapping & Strategies

Quantitative Flow

Equivalent Load Units

Definition & examples

From / To Matrix

Forward / Backward Flows

Qualitative Flow

Relationship Charts

A, E, I, O, U, X classifications

Estimating Department Space (Rough)

Considerations

Equipment Footprint Space using Equipment Fractions

Product Layout (Mass Production)

Process Layout (Job Shop)

GT Layout (Families)

Aisle Space Estimations

Aisle Width Minimums (Equipment)

Material Covered: Lectures 00 - 06