



PRODUCTION DESIGN PROCEDURE

2-3th week:

DESIGNING PROCESS

- Product design
- Process design
- Operation design
- Facilities Design



DESIGNING PROCESS

1. The analysis of product or service
2. The determination of what (production) operations are necessary to produce or perform it.
3. How this will be carried out
4. What machines, equipment, tools and facilities are necessary
5. What standards of output will govern the performance

Product design:

- Research and development
- Design
- Test

Product have to: functional, properly quality,
acceptable to the buyer in appearance,
producible

Process design:

- Analyze specifications
- Make or buy analysis
- Material selection
- Process selection
- Dimensional analysis
- Determine manufacturing operations
- Select or specify production equipment
- Specify tools and auxiliary equip.
- Establish operation sequence
- Prepare production routing

Operation design:

- Methods analysis and design
- Work measurement
- Work standard
- Equipment requirements
- Manpower requirements

Facilities Design:

- Material flow design
- System design
- Activity relations analysis
- Space allocation
- Plant layout design
- Storage Facilities design
- Establish building specifications

Installation:

- Building construction liason
- Equipment installation liason

Factors for consideration in design of product:

A. product: Total quantity, production rate, production method, Life expectancy, stability (likelihood of change), Durability, Function, Time to get into production, customer desires, Quality level, process requirements (specifications), estimated selling price, complexity, degree of standardization, competition

Continued:

B. Material: type, form, size, shape, properties, scrap and waste, finishing cost, cost, source, estimated inventory, handleability, fragility, Availability, method of receipt

Factors for consideration in design of process:

- A. Mechanical factors : capability, accuracy, stability, general vs special purpose, flexibility, adaptability, life expectancy, reliability, relative complexity, capacity, etc.

Continued:

B. Operating factors: efficiency, interruptibility of process, set-up time, frequency of use, de-bugging time, percentage of time used, safety, installation time, manpower requirements, human factors, physical effort required

Continued:

C. Cost factors: Investment, tools, installation, start-up, operating, funds available, savings, ROI, own or lease, resale value, space lost or gained, equipments cost trend.

Continued:

D. Building factors: Available space, Column spacing, floor capacity, Ceiling height

Continued:

E. Miscellaneous factors: Availability, applicable standards, ecological consequences, warranty, Patents, intangible factors (security, service availability, manufacturer's reputation, quality of service, quality of service), plans for expansion, business trends