



National Institute of Technology Jamshedpur
Jamshedpur - 831 014, JHARKHAND
Department of Manufacturing Engineering

Course Handout

Autumn Semester Session 2020

Batch: B. Tech 6th Semester (Manufacturing Engineering)

Course code: PR601

Course Title: Quantity Production Methods (QPM)

Instructor in-Charge: Dr. Subhash Singh

Date: 03/01/2020

Credits: 3

Course Description

Classification of various economic production systems in industries along with the concepts related to mass production of various objects is studied. Understand the importance of jigs, fixtures and role of automation in industries. Detailed study of special purpose machines in mass production. Group technology study and selection of process for economic production are studied. Topics on flexible automation and computer control in manufacturing are illustrated.

Scope: The course aims at providing an idea about the various production systems in industries as well as the concepts of automation system control, tool layouts, mass production.

Course outcomes

MFG7123.1: Memorize the basic concepts and definitions associated with the production methods and their explanation.

MFG7123.2: Specify the design factors and purpose of jigs and fixtures in large production methods. Also critically analyze the role of automation in quantity production.

MFG7123.3: Analyze the factors affecting quantity production methods of small products like washers, seal laminates, cups, strong and soft tubes through various shearing operations.

MFG7123.4: Analyze the property of materials like polymer, ceramics and composites affect the quantity production.

MFG7123.4: Comprehend the concept of Group technology. Assessment and control of productivity, quality and economy in quantity production methods.

Course Plan

| Lecture No. | Topics to be covered | Reference |
|--------------------|--|------------------|
| 1-3 | Classification of production, Industrial and economical aspects of production in large quantity | T1,T3,R1 |
| 4-6 | various methods of quantity production, production of common engineering objects like rods Production of bars, rails, tubes, threaded objects, gears, bearings, cams, cutting tools etc. | T1,T3,R1 |
| 6-10 | Purpose, design and use of jigs and fixtures. Role of automation in quantity production scheduling | T1,T3,R1 |
| 11-13 | Tool layout and cam layout for semi-automatic and automatic machine tools. | T1,T3,R1 |
| 14-16 | Large quantity production by special purpose and transfer machines | T1,T3,R1 |
| 17-19 | Quantity production of small items like washers, seals laminates, cups, strong | T1,T3,R1 |

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|-------|---|-----------------|
| | and soft tubes, coins etc. by shearing forming and embossing in press tools | |
| 20-22 | Industrial methods of manufacturing of pins, needles, wires, rims and similar products. | T1,T3,R1 |
| 23-25 | Large scale production of various objects made of polymers, ceramics and composites | T1,T2,R1 |
| 26-28 | Quantity production by processes like spinning, bulging, hydroforming, magneto-forming and explosive forming. | T1,T2,R1 |
| 29-32 | Group Technology, selection of processes, tools and systems and process planning for feasible and economic production | T1,T2,R1 |
| 33-36 | Flexible automation and computer control in manufacturing | T1,T2,R1 |
| 37-40 | Assessment and control of productivity, quality and economy in quantity production. | T1,T2,R1 |

Text Books

T1: Fundamentals of Modern Manufacturing by Mikell P Grover.

T2: Manufacturing Processes and Systems, By Phillip F. Ostwald, Jairo Munoz

T3: Textbook of Production Engineering Textbook by A. K. CHITALE and K. C. Jain

Reference Books

R1: Production Systems Engineering Textbook by Jingshan Li and Semyon M. Meerkov

Website links:

1. <https://www.sciencedirect.com/search?q=quantity%20production%20methods&show=25&sortBy=relevance>

Evaluation Scheme (EC)

| EC No. | Evaluation Component | Duration | Weightage | Date & Time | Nature of Component |
|--------|----------------------|----------|-----------|----------------------------|---------------------|
| 1. | Mid Semester | 2 Hrs | 30% | Refer to Academic calendar | Closed Book |
| 2. | End Semester | 3 Hrs. | 50% | | Closed Book |
| 3. | Internal Assessment | -- | 20% | | |

Consultation Hours: 4PM to 6PM (Monday to Friday) In CAD/CAM Lab of Manufacturing Dept.

Note: All notices regarding the course will be displayed only on the Department of Manufacturing Engineering notice board.

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