

**MEE-S401**

# **Computer aided manufacturing**

Er. Ramendra Singh Niranjana

Mechanical Engg. Dept.

U.I.E.T, C.S.J.M. UNIV. KANPUR

**Course Code: MEE-S401T**

**Course Name: Engineering Mechanics**

**Breakup: 3 – 0 – 0 – 3**

**Course Details:** Fundamental concepts of numerical control. Direct numerical control (DNC) and computer numerical control (CNC), Adaptive control of manufacturing process, Manufacturing system concepts, Computer process monitoring and control, Offline use of computers, computer process interface, programming introduction to FMS. Laboratory component shall emphasize on computer numerical machines and FMS, robotics.

**Course Code: MEE-S401P**

**Breakup: 0 – 0 – 3 – 2**

**Course Name: Computer aided manufacturing Lab**

## Text Books and References:

- ▶ Radha Krishnan and Subramanyam S., CAD/CAM/CIM , Wiley eastern ltd., india
- ▶ Koren Y. ,Benuri J., Numerical control of machinestools , Khanna publishers , ND
- ▶ Kumar & Jha , Numerical control of machines Roger S. Pressman ,
- ▶ Numerical control and computer aided manufacturing John WilleyAND SONS
- ▶ John williams Childs JJ, Principles ofnumerical controls, Industrial press inc , NY

# Numerical Control

**Production :-**

**Automaticity :-**

**Automation :-** First used in early 1940's

Three stages of development-

\*First Industrial Revolution – mechanisation

\*Second – fixed automation

\*Third – flexible

**Production Systems:-**

**Manufacturing Systems :-**

Manufacturing companies can be following three types –

\*Basic Producer– steel producers, transform iron ore into steel ingots

\*Converter– here steel ingot into sheet metal or wood pulp into paper

\*Fabricator– assemble final products eg

Another way of classifying production activity based on the quantity of product made.

Job shop –

Batch production –

Mass production –

**Types of Automation**–The word ‘Automation’ is derived from greek words “Auto”(self) and “Matos” (moving). Automation therefore is the mechanism for systems that “move by itself”.

- Fixed auton–
- Programmable Auton–
- Flexible Automation–

## 1– Fixed automation–

Characteristics–

- Used where production rates are high
- High initial cost due to tailor made equipment
- Normally cannot accommodate product changes
- Depends largely on skill to organize the operations

Eg– mechanised assembly lines

Machining transfer line