

CNC TECHNOLOGY

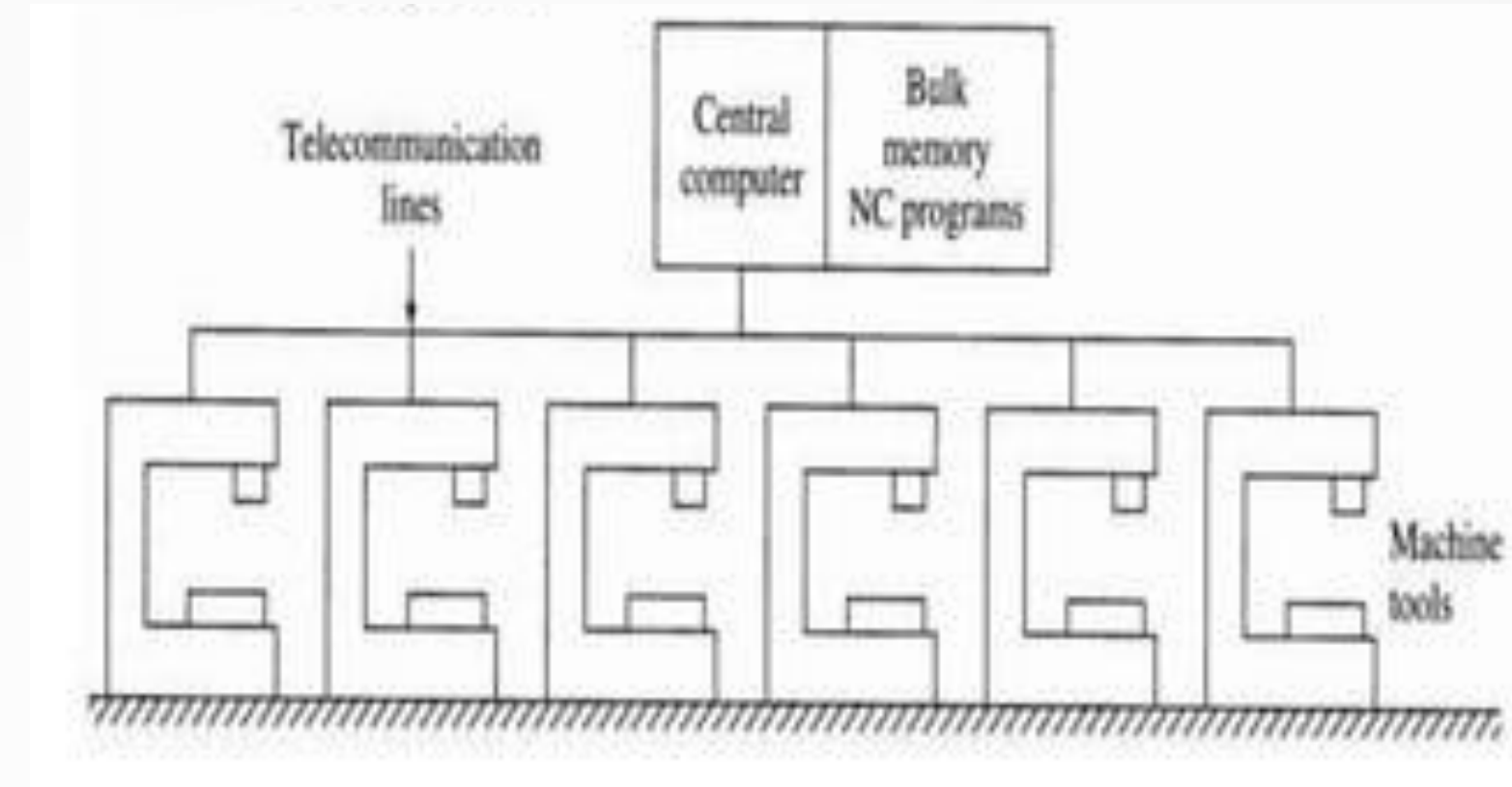
UNIT - I INTRODUCTION TO CNC MACHINE TOOL

CNC (Computer Numerical Control), the instructions are stored as a program in a micro-computer attached to the machine. The computer will also handle much of the control logic of the machine, making it more adaptable than earlier hard-wired controllers

CONCEPT OF CNC & DNC

Simply:

- **CNC (Computer Numerical Control) uses a computer to program the code and a machine controller unit to read the code fed to the machine.**
- **DNC (Distributive Numerical Control) is a network of multiple CNC machines that connect to a single mainframe computer**



CONCEPT OF "COMPUTER NUMERICAL CONTROL"

- In CNC, far off controlling of the operation is not possible.
- . CNC is transferring machine instruction.
- . In the CNC program feeds directly into the computer by a small keyboard similar to our traditional keyboard.
- Using CNC PC manipulates one NC machine
- CNC is a feedback system.
- CNC has low processing power when compared to DNC.
- . In CNC we can modify the program in the computer.
- CNC cost is high.
- In CNC machine accuracy is high.
- CNC machine maintenance is high.

CONCEPT OF "DISTRIBUTIVE NUMERICAL CONTROL"

- While in DNC facilitate far-flung control.
- DNC controls the information distribution to a wide variety of machines.
- In DNC part program is feed to the machine through the main computer.
- Using the DNC programmer can manage more than one NC laptop as required.
- While DNC did not remove the tape.
- DNC has high processing energy when compared to CNC.
- In DNC order to modify a single computer is used.
- While in DNC control more than 100 CNC machines at a time.
- In DNC two way communication by telecommunication line.
- Maintenance is low in DNC machines.

CLASSIFICATION OF CNC MACHINES

*There are several different types of CNC Machines,
Each one has its own unique functions.*

- CNC Milling Machine
- CNC Plasma-Cutting Machine
- CNC Lathe Machine
- CNC Laser Cutting Machine
- CNC Turning machine
- CNC Drilling and Threading Machine



CNC MILLING MACHINE

- One of the most common types, milling CNC machines feature built-in tools for drilling and cutting. Materials are placed inside the milling CNC machine, after which the computer will guide the tools to drill or cut it. Most milling CNC machines are available in three- to six-axis configurations.



CNC PLASMA-CUTTING MACHINE

- Like milling CNC machines, plasma cutting CNC machines are also used to cut materials. However, they differ from their milling counterparts by performing this operation using a plasma torch. Plasma-cutting CNC machines feature a high-powered torch that's able to cut through rough materials like metal. While electric welding yields temperatures of up to 10,000 degrees Fahrenheit, plasma torches achieve temperatures of up to 50,000 degrees Fahrenheit.



CNC LATHE MACHINE

- Lathe CNC machines are characterized by their ability to rotate materials while in operation. They usually have a fewer number of axes than milling CNC machines, making them smaller and more compact. Lathe CNC machines feature a lathe in the center that manipulates and moves the material into the position as programmed on the computer.



CNC LASER-CUTTING MACHINE

- Not to be confused with plasma-cutting CNC machines, laser-cutting CNC machines are designed to cut through tough materials, though they use a laser to perform this task rather than a plasma torch. Lasers tend to offer a higher level of cutting accuracy, but they aren't quite as strong as plasma torches. Laser-cutting CNC machines generally use one of three types of lasers: CO₂, neodymium (Nd) or yttrium-aluminum-garnet (Nd:YAG)



CNC TURNING MACHINE

- [CNC Turning](#) is a manufacturing process in which bars of material are held in a chuck and rotated while a tool is fed to the piece to remove material to create the desired shape. A turret (shown center), with tooling attached is programmed to move to the bar of raw material and remove material to create the programmed result.



CNC DRILLING & THEARDING MACHINE

- CNC drilling is a machining process that utilizes a rotating cutting tool to produce round holes in a stationary workpiece. The holes are typically made to accommodate machine screws or bolts for assembly purposes. Tapping in manufacturing is the process of cutting a thread inside a hole, which needs to be drilled with tap drill and chamfered at the end, used for screws or bolts being threaded into the hole

