

Fundamental of CNC

Name of Subject: Fundamental of CNC	Subject code: CBME- 103	Course: B.Voc. Tool and Die Manufacturing	Credit: 2 T – 2 P - 0
External Marks: 70	Internal Marks: 30	SEM- 1	SEC

Unit-1

Introduction of the CNC Machines: Basic components of CNC machines, Advantages and Disadvantages of CNC machines, Application of CNC machines, difference between Conventional and CNC machines, Environmental control for CNC Machines.

Unit-2

NC Machine Tooling: Introduction to cutting tools for CNC Machine on the basis of Setting up of cutting tools- pre-set tooling, qualified tools, on the basis of Cutting tool construction- solid tools, brazed tools, inserted bit Tools, on the basis of cutting tool material- high carbon tools steels (HCS), Cast alloys, Cemented carbides and others. Factors considered in selecting the tooling for CNC Machines.

Unit-3

Holding Devices: Classification, Basic Principle of tool design, types of tool holding devices-spindle tooling-flexible tooling, work locating and holding devices, basic principles of working holding and location, special devices used in CNC Machines.

Unit-4

Automatic Tool Changer in CNC: Introduction of ATC, Features of ATC, Basic types of ATC, working of ATC, stages of tool change: cycle-tool selection- tool transfer.

Unit-5

Components of CNC Machine: Components of a CNC System, Comparison of conventional machine tools and CNC Machine tools. Constructional details CNC Turning and Machining Centre, Slide ways and guide ways, Swarf removal, Feedback devices, speed control, Safety devices. Programmable logic controllers and micro controllers.

Learning Outcomes:

- To be able to differentiate between conventional & CNC Machine in respect to working, components, operation.
- To have an understanding of setting up of tooling for CNC. One should have knowledge of types of cutting tools & tool material used.
- To have an understanding of tool & work holding devices used & locating principle.
- To know about tool changing mechanism, working, its type used in CNC.
- To have an understanding of components used in CNC, their functions

Text Book:-

1. CNC Machines by By B. S. Pabla, M. Adithan(First Edition), New Age International (P) Ltd.
2. CNC Machines and Automation Paperback – 2014, by Khushdeep Goyal, Katson Books
3. CNC Machines by Sandeep Bajaj, Ishan Publication

Reference Book:-

CNC Technology & Programming by Tilak Raj, Dhanpat Rai Publication