

## NC PROGRAMMING LAB

### INTRODUCTION

Automation is a technology adopted with the application of mechanical, electronic and computer – based systems to operate and control production.

#### **SinuTrain - the control-identical NC-programming station**

The SinuTrain offline programming station brings SINUMERIK Operate to the PC, including an animated machine control panel, to create a training situation that is very similar to that experienced in reality. This facilitates an easy transition from a training into a practical environment. This powerful tool allows NC programs to be programmed offline at a PC in an environment that is close to reality; these NC programs can then be directly transferred to the CNC. CNCs can be programmed in a training environment exactly as they will be subsequently used in real machines controlled by SINUMERIK.

- **SINUMERIK 808D:** is software package identical to the control system itself, which further simplifies handling machine tools. Used as practical training software, work pieces can be programmed and simulated offline.

Optimized for basic turning and milling applications

As a result of its technology-specific version, the SINUMERIK 808D ADVANCED control system is perfectly preconfigured for turning and milling. The range of applications addressed extends from basic milling machines or simple machining centers, through cycle-controlled lathes – up to basic full CNC lathes. For simple milling functions, based on its hardware and software expansions, SINUMERIK 808D ADVANCED offers sufficient performance for mold making and toolmaking.

- **SINUMERIK 808D Controller:** Once we understand the software, we can now use the controller to write the NC program directly on it. Here different manufacturing cycles can be used to increase production rate. Simulations can be done for any faulty NC program at the beginning only to avoid any damage or accident. It will give the feel as real time machining on the machine.

Different type of cycles can be used to perform machining operation using 808d software.

- **SINUMERIK 828D Controller:** It is the higher version of 808D controller. With this controller we can eliminate NC programs feeding manually to the machine which is time consuming and needs lengthy calculations. With this controller we can directly use the manufacturing cycles which reduces the calculations and time. Thus we can get more realistic and accurate results.

The advantage of this controller is that we can simulate the operations prior to actual machining so that we can check whether the program is faulty or not, tool approach and retractions cycle time etc.

- Some of the cycles that can be performed by using /808D &828D controller are,

Using Turning controller following cycles can be performed,

- **Turning cycles**

CYCLE92: Cut-off

CYCLE93: Recess

CYCLE94: Undercut (DIN form E and F)

CYCLE95: Stock removal with relief cutting

CYCLE96: Thread undercut

CYCLE98: Thread chain

CYCLE99: Thread cutting

Using milling controller following cycles can be performed,

- **Drilling cycles**

Few examples of drilling cycles are

CYCLE81: Drilling, centering

CYCLE82: Drilling, counter boring

CYCLE83: Deep-hole drilling

CYCLE84: Rigid tapping

CYCLE840: Tapping with compensating chuck

CYCLE85: Reaming 1

CYCLE86: Boring

## **SINUMERIK 840**

It is the customized version of 828D controller. SINUMERIK 840D sl is considered to be the standard in the premium class CNCs, which is certainly justified. Maximum CNC performance, along with a high degree of flexibility and openness – which has been unachievable up until now – represent the basis for almost every machine concept. A high-performance hardware architecture and intelligent control algorithms as well as premium class drive and motor technology class ensure the highest dynamic performance and machining precision. CNC SINUMERIK 840D sl is complemented by a comprehensive range of solutions for integration into IT environments.

## Courses offered

S.No	Domain	Course Name	Hours	Mandatory Prerequisite
1	NC	MILLING-Numerical control programming	32	Mechanical, Automobile, Production Engineering (2 <sup>nd</sup> Year)
2	NC	TURNING-Numerical control programming	32	Mechanical, Automobile, Production Engineering (2 <sup>nd</sup> Year)