



I	SECTION CODE	CNC
II	SECTION NAME	CNC LAB
III	COURSE CODE	CNC -01
IV	COURSE TITLE	AWARNNESS COURSE ON CNC TURNING
V	DURATION	01 Week
IV	OBJECTIVES	
On completion of the course, the learner will be able to		
<ul style="list-style-type: none">➤ Understand the basic concepts of CNC Turning.➤ Understand the technical terms and technology of CNC machining process (Turning).		

VI Course Content :


Theory topics	Practical Topics
Introduction to CNC machine tools, difference between conventional and CNC machine tool, Coordinate systems of CNC turning machine, Description of the principle parts of CNC turning machine, Part selection on CNC turning machine, Process planning of CNC machining. Tool geometrical offset and work zero offset. Basic concept of part programming.	Demo on CNC Turning machine. Job set up and execution of part programme on the machine.



I	SECTION CODE	CNC
II	SECTION NAME	CNC LAB
III	COURSE CODE	CNC -02
IV	COURSE TITLE	AWARNESS COURSE ON CNC MILLING
V	DURATION	01 Week
IV	OBJECTIVES	
On completion of the course, the learner will be able to		
<ul style="list-style-type: none">➤ Understand the basic concepts of CNC Milling.➤ Understand the technical terms and technology of CNC machining process(Milling).		

VI Course Content :

Theory topics	Practical Topics
Introduction to CNC machine tools, difference between conventional and CNC machine tool, Coordinate systems of CNC Milling machine, Description of the principle parts of CNC Milling machine, Part selection on CNC Milling machine, Process planning of CNC machining. Tool geometrical offset and work zero offset. Basic concept of part programming	Demo on CNC Milling machine. Job set up and execution of part programme on the machine.

	ADVANCED TRAINING INSTITUTE, HYDERABAD	PR04/F01
Revision: 01	LEARNING CONTENT	Page 3 of 7

I	SECTION CODE	CNC
II	SECTION NAME	CNC LAB
III	COURSE CODE	CNC -03
IV	COURSE TITLE	BASICS OF PROGRAMMING AND OPERATION ON CNC TURNING MACHINE
V	DURATION	02 Weeks
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to</p> <ul style="list-style-type: none"> ➤ Operate the CNC lathe Machine Control panel independently. ➤ Perform Tool offset and work offset. ➤ Perform operation involving linear / circular interpolation. ➤ Perform basic facing, turning, drilling, boring, grooving, threading and taper turning operations ➤ Work as turning operator in industry with basic skill set. 		

VI Course Content :

Theory topics	Practical Topics
Distinguish between conventional and CNC Machine tool, Description of the principle parts of Turning machine, Different coordinate systems, Structure of part programming for turning machines, concept of work and tool geometrical offsets.	Practice on Machine control panel, Different operating modes of the Turning machine, Creation of work offset & Tool Offset (Job setting and Tool setting), Demo of Tool Turret, Demo of CNC Turning machine, Graphic simulation of Part programmes, Practice machining exercises on the machine involving linear interpolation, circular interpolation, taper turning, boring, Grooving, Threading, contour turning and drilling operations.



I	SECTION CODE	CNC
II	SECTION NAME	CNC LAB
III	COURSE CODE	CNC -04
IV	COURSE TITLE	BASICS OF PROGRAMMING AND OPERATION ON CNC MILLING MACHINE
V	DURATION	02 Weeks
IV	OBJECTIVES	

On completion of the course, the learner will be able to

- Operate the CNC Milling Machine Control panel independently..
- Perform Tool offset and Job offset.
- Do operation involving linear / circular interpolation
- Work as milling operator in industry with basic skill set.

VI Course Content :

Theory topics	Practical Topics
Distinguish between conventional and CNC Machine tool, Description of the principle parts of CNC Milling machine, Different coordinate systems, Structure of part programming for CNC milling machines, concept of work and tool geometrical offsets.	Practice on Machine control panel, Different operating modes of the CNC Milling machine, Creation of work offset & Tool Offset (Job setting and Tool setting), Demo of CNC Milling Machine, Graphic simulation of Part programmes, Practice machining exercises on the machine involving linear interpolation, circular interpolation, face milling, edge milling, slot milling and hole machining operations.



I	SECTION CODE	CNC
II	SECTION NAME	CNC LAB
III	COURSE CODE	CNC -05
IV	COURSE TITLE	ADVANCED PROGRAMMING AND OPERATION ON CNC HORIZONTAL MACHINING CENTRE (HMC)
V	DURATION	02 Weeks
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to</p> <ul style="list-style-type: none"> ➤ Operate the CNC Horizontal Machining center Control panel independently. ➤ Perform Tool offset and Job offset. ➤ Perform operation involving linear / circular interpolation. ➤ Perform Pocket/ contour Milling Operation ➤ Understand the Hydraulic and pneumatic parts and it's operation of HMC ➤ Work as machine centre operator in industry with required skill set. 		

VI Course Content :

Theory topics	Practical Topics
Description of the principle parts of CNC Horizontal machining centre, Constructional features of different machine elements, Different coordinate systems, Structure of part programming for Siemens (Sinumerik 840D) control machines, concept of work and tool geometrical offsets. General introduction to Mechanical & Hydraulic elements.	Practice on Machine control panel, Different operating modes of the CNC Machining centre, Creation of work offset & Tool Offset (Job setting and Tool setting), Demo of Auto Tool Changer, Demo of CNC HMC, Graphic simulation of Part programmes, Practice machining exercises on the machine involving linear interpolation, circular interpolation and hole machining operations with Canned cycles, Sub programming, pocket milling, contour milling, special cycles for machining using support function.



I	SECTION CODE	CNC
II	SECTION NAME	CNC LAB
III	COURSE CODE	CNC -06
IV	COURSE TITLE	ADVANCED PROGRAMMING AND OPERATION ON CNC VERTICAL MACHINING CENTRE(VMC)
V	DURATION	02 Weeks
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to</p> <ul style="list-style-type: none"> ➤ Operate the CNC Vertical Machining center Control panel independently. ➤ Perform Tool offset and Job offset. ➤ Do operation involving linear / circular interpolation. ➤ Do Pocket/ contour Milling Operation ➤ Understand the Hydraulic and pneumatic parts and it's operation of VMC ➤ Work as milling operator in industry with required skill set. 		

VI Course Content :

Theory topics	Practical Topics
Description of the principle parts of CNC Vertical machining centre, Constructional features of different machine elements, Different coordinate systems, Structure of part programming for FANUC control machines, concept of work and tool geometrical offsets. General introduction to Mechanical & Hydraulic elements.	Practice on Machine control panel, Different operating modes of the CNC Machining centre, Creation of work offset & Tool Offset (Job setting and Tool setting), Demo of Auto Tool Changer, Demo of CNC VMC, Graphic simulation of Part programmes, Practice machining exercises on the machine involving linear interpolation, circular interpolation and hole machining operations with Canned cycles, Sub programming, pocket milling, contour milling.



I	SECTION CODE	CNC
II	SECTION NAME	CNC LAB
III	COURSE CODE	CNC -07
IV	COURSE TITLE	ADVANCED PROGRAMMING AND OPERATION ON CNC TURN MILL CENTRE
V	DURATION	02 Weeks

IV OBJECTIVES

On completion of the course, the learner will be able to

- Operate the CNC Turn Mill Centre Control panel independently.
- Perform Tool offset and Job offset.
- Perform operation involving linear / circular interpolation.
- Perform facing, turning by using stock removal cycles, drilling, boring by using stock removal cycles, grooving, threading by using multiple repetitive cycle, multi start threading and milling operations with C-axis.
- Work as turnmill machine operator in industry with required skill set.

VI Course Content :

Theory topics	Practical Topics
Description of the principle parts of Turn Mill Centre, Constructional features of Turn Mill centre, Different coordinate systems, concept of 3 rd axis operation in turning machine, Structure of part programming for Turn mill machines with Fanuc Oi TB control, concept of work and tool geometrical offsets, Calculation of coordinate values for Milling and Drilling applications by using 3 rd axis and mapping on to the machine coordinate system for programming.	Practice on Machine control panel, Different operating modes of the Turn mill centre, Creation of work offset & Tool Offset (Job setting and Tool setting), Referencing of 3 rd axis for milling application, Demo of Tool Turret, Demo of Live tool operation on tool turret, Demo of CNC Turning machine, Graphic simulation of Part programmes, Practice machining exercises on the machine involving linear interpolation, circular interpolation by using stock removal cycles, polar interpolation, stock removal cycles and multiple repetitive cycles.