Course Name	:	CNC Turning Operation - Basic
Course Code	:	CNCT01

Course Objective

After successful completion of this course, user will able to Work on Basic operation of CNC Turning.

Duration of Course = 40 hrs.

Lecture/Lab wise breakup		Number of hours
1.	**Safety Procedures**- Introduction, Equipment of safety procedures, Work practices, Work Environment	5
2.	**Machine configuration:** Introduction, Axes configuration, Component of machine, machine structure base, column and table, Head stock.	5
3.	**Tooling system:** Introduction, specification, selection of tool, how it works, machine protective system, cutting tools properties, inserts, tool holder selection. **CNC Control:** Introduction, closed loop control system, open loop control system **Drives system:** Introduction, types of drives, types of motors, spindle, Axes	10
4.	Introduction to G codes and M codes, program format, machine zero position, work zero point, tool reference point, coordinate system- absolute, incremental, work offset measurement, tool length measurement.	
5.	**Operation:** Turning-Facing-Profile Turn-Threading-Grooving-Drilling-Boring-Tapping External and internal Profile.	20

Course Outcome

- Safety procedures, Basic CNC Machine Operation, tooling system, Tool Offset, Work Offset, Ability to operate CNC Machine, Setting the CNC Job, can apply knowledge on CNC programming to certain range of applications.

Course Name	:	CNC Programming Turning
Course Code	:	CNCT02

Course Objective
After successful completion of this course user will able to Work on SIEMENS control and programming of various canned cycles.

	Duration of course = 40 hrs.

Lecture/Lab wise breakup		Number of Lectures
1.	**Introduction to CNC:** About (History), Need of CNC, Applications & Advantage of CNC-Coordinates of CNC Longitudinal plane Axis X & Transverse Plane Axis Z-CNC Dimensioning Absolute & Incremental-Geometric & Machine Codes function.	6
2.	**Functions of Siemens Controls:** PPU **(**Panel Processing unit) Menu & operation Navigation-Various modes of operation Jog, MDI, SBK, Auto, Etc. **Program format**- Introduction to G codes and M codes, Co-ordinate systems – Absolute Incremental. Plane Selection-Basic Motion Command-Dwell-Feed-Spindle-Tool types & its properties	4
3.	**Program Structure:** Startup Program-Part program (Sub program)-End of program **Tool nose radius Compensation:** Tool nose radius, Tool orientation**,** Tool direction**,** Offset register **Cutting Tool and its Parameters:** Cutting speed, Feed rate, Depth of cut, Tool material, Work material Reading of Cad Drawing & Blue prints	4
4.	**Programming:** Create a part program and Simulations Simple Turning cycle, Simple facing cycle, Stock removal turning cycle, Stock removal facing cycle, Stock removal contour cycle, Threading cycle, Grooving cycle, Centre drilling cycle, Deep hole drilling cycle, Internal boring cycle, Internal threading cycle, Tapping cycle,	26

Course Name	:	CNC Operation Turning
Course Code	:	CNCT03

Course Objective

After successful completion of this course user will able to perform machine operations of Turning center with ISO / Siemens controls, execution of sample program, work and Tool length offset compensation.

	Duration of course = 40 hrs.

Lecture/Lab wise breakup		Number of Hours
1.	**Creating Sample Program:** Creating a new CNC part program – Opening a newly Created part program – Creating new tools in the Tool Library – Simulation of part program.	4
2.	**Machine Operations – JOG Mode:** Turret Referencing and Indexing in JOG Mode – Coolant Operation Procedure in JOG Mode – Spindle ON/OFF in JOG Mode – Axes Movement in RAPID, JOG, MPG (Manual Pulse Generator) Mode – Work piece Clamping Procedure in JOG Mode.	8
3.	**Machine Operations – MDA Mode:** Spindle (CW) & (CCW) Rotation in MDA Mode – Executing the tool change Command in MDA Mode – Coolant Operation Procedure in MDA Mode – Axes Reference in MDA Mode – Executing the dry run Program in MDA Mode – Pneumatic Chuck Operating Procedure in MDA Mode.	8
4.	**Machine Execution:** Clamping of Work piece with the three & four jaw Chuck – Mounting of cutting Tools on the Turret – Tool length Offset Procedure for Turning tool, threading tool, grooving tool, Center drill tool, Twist drill tool – Machining Execution of Sample program.	20

Course Outcome

CNC Machine Operation, Tool Offset, Wear Offset, Ability to operate CNC Machine, Setting of the CNC job, Loading unloading, Daily maintenance of CNC Machine, Routine maintenance of CNC machine

Course Name	:	**CNC Commissioning Turning**
Course Code	:	CNCT04

Course Objective
After successful completion of this course user will able to commission a Turning center with Siemens control, Test run and demonstration of machine.

	Duration of course= 20 hrs.

Lecture/Lab wise breakup	**Number of Lectures**
1. **Introduction:** Introduction to turning Commissioning System – Safety Precautions – Pre-Installation requirements – Visual Inspection of packed Machine.	**4**
2. **Machine Commissioning:** Machine Loading/Unloading – Unpacking the machine – Mounting the Vibration Pad, leveling the Machine – Machine Assembly Coolant System, Lubrication, Chip tray – Machine tool Accessories – Components of Machine – Stabilizer Connections – Transformer Connections – Machine power connections – Machine power up – Connecting the FRL unit – Machine test run.	**16**

Course Outcome
After successful completion of this course, user will be able to commission a Machining center with Siemens control, Test run and demonstration of machine