

CNC Machine Laboratory – Siemens Centre

About the Laboratory

The CNC Machine Laboratory provides practical knowledge of the automated manufacturing concepts, CNC programming and precision machining. It bridges the gap between theoretical concepts and real-world engineering applications through hands-on experimentation. The laboratory enables students to have hands on practice of different codes for various functions like automatic tool change, coolant flow, multi axis control. It is equipped with experimental setups such as CNC turning center, CNC vertical milling machine, Force and vibration sensors. These experiments help students understand the operating principles, performance characteristics, and engineering applications of the CNC machines. The laboratory develops analytical, experimental, and problem-solving skills while enhancing students' ability to validate theoretical concepts. It also promotes technical report writing, teamwork, and safe laboratory practices. The laboratory supports the attainment of Course Outcomes (COs) and Programme Outcomes (POs) and prepares students for advanced studies in machining of difficult to cut materials, programming with CNC codes, and industrial application in the form of measuring cutting force and vibration for machining of advanced materials.

Objectives of the CNC Machine Lab

The CNC Machine Laboratory aims to provide students with practical knowledge of the CNC machine tools and their effective operation through programming.

The key objectives are:

1. To train students in manual part programming and computer assisted code generation using standard M codes.

2. To offer hands on experience in setting up, operating and programming industrial grade CNC lathe and milling machines.
3. To demonstrate the workflow from digital and solid modeling to tool path generation and simulation using siemens software.
4. To study the optimal cutting parameters, tool selection and work-tool referencing on the machine.
5. To develop experimental, analytical, and project based learning skills enabling students to solve practical manufacturing and R&D challenges.
6. To enhance technical competency in conducting experiments, recording observations, analysing data, and preparing engineering reports.

Learning Facilities Available to Students

The laboratory enables B.Tech (UG) students to make their projects on the CNC machine tools and learn part programming by doing hands on practice on the machines. The Laboratory can accommodate up to 20 students at a time for conducting practical experiments. The laboratory provides a comfortable, safe, and well-equipped learning environment for B.Tech students.

1. CNC maxturn plus with siemens controller.
2. CNC maxmill plus with Siemens Controller
3. Force and Vibration sensors for each machine

The laboratory offers a good chance to the students for learning basic concepts of part programming through practice on the machine tool itself, referencing of the job on the work table, automatic tool selection, operating the machine, basic troubleshooting and making their projects by developing a program for the part geometry and measuring cutting force and vibration for machining of advanced materials for addition into the machining database.

Faculty In-Charge

Dr. Jatinder Kumar

Associate Professor

Technical Staff

Sh. Paramjeet Singh

Senior Technical Assistant

Laboratory Courses

S. No.	Course Code	Course Name	Programme
1	MEPC 312	Production Technology–II (P)	B.Tech. (Mechanical Engineering), 5th Semester
2	PIPC 216	Production Technology–II (P)	B.Tech. (Production & Industrial Engineering), 4th Semester
3	RAPC 326	CAD/CAM (P)	B.Tech. (Robotics and Automation), 6th Semester
4	MME2L01	Advanced Machining Processes (P)	M.Tech. (Production & Industrial Engineering), 1st Semester

Major Equipment/Software

S. No.	Equipment/Software	Quantity	Utilization
1	CNC Maxturn Plus with Siemens Controller	01	B.Tech., M.Tech.
2	CNC Maxmill Plus with Siemens Controller	01	B.Tech., M.Tech.
3	Force and Vibration Sensors	02	B.Tech., M.Tech.

Laboratory Photographs



CNC MAXTURN PLUS MACHINE WITH SIEMENS CONTROLLER



**CNC MAXMILL PLUS MACHINE WITH SIEMENS
CONTROLLER**