

CNC Controller Laboratory – Siemens Centre of Excellence (SCoE)

About the Laboratory

The CNC Controller Laboratory provides students the ability to understand controller architecture, Read and write part programs to define various parameters of machining, practice system startup, axis referencing, manual data input, manage tool offsets and provide compensation, integrate CAD/CAM software by generating and simulating tool paths before actual cutting. The students can monitor real time feedback loops, error corrections, and axis synchronization. It is very helpful for accurate interpretation of G Codes and M Codes, safety and diagnostics, monitoring machine performance and operational parameters, spindle and feed control and optimised cutting conditions for productivity and tool life. The interface are very user friendly and offers high speed processing of data. The controller kits are a very convenient, easy to operate and practice option for learning key concepts of programming by way of simulating the programming without involving any risk of damage to the tool or machine components due to wrong data input or parameter selection.

Objectives of the CNC Controller Lab

The CNC controller 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 teach the function of hardware components such as CPU, memory, Servo drives, feedback systems etc
2. To read, write, troubleshoot part programs that define tool paths, feed rates and spindle speed.
3. To demonstrate the axis referencing, manual data input (MDI), jog modes on industrial controllers.
4. To demonstrate setting of tool length, tool offsets, coordinates to maintain high dimensional accuracy.
5. Bridge digital design concepts with physical machine execution by generating and simulating tool paths before actual cutting.

Learning Facilities Available to Students

The laboratory enables B.Tech (UG) students to simulate the part programming by doing hands on practice on the controller kits. 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. 808D Turning Kit.
2. 808D milling Kit
3. 840D SL kit with software

The laboratory offers a good chance to the students for practical training on how digital instructions are interpreted and converted into precise mechanical movements using industrial control systems. Students learn to execute dry runs and simulations on the controller to prevent tool crashes.

Faculty In-Charge

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Laboratory Courses

S. No.	Course Code	Course Name	Programme
1	PIPC 216	Production Technology–II (P)	B.Tech. (Production & Industrial Engineering), 4th Semester

S. No.	Course Code	Course Name	Programme
2	RAPC 326	CAD/CAM (P)	B.Tech. (Robotics and Automation), 6th Semester

Major Equipment/Software

S. No.	Equipment/Software	Quantity	Utilization
1	Siemens 808D Turning Kit	02	B.Tech.
2	Siemens 808D Milling Kit	02	B.Tech.
3	Siemens 840D SL Kit with SinuTrain Software	01	B.Tech.

Laboratory Photographs



840D SL KIT with Sinutrain Software



808 Turning Kit



808D Milling Kit