

## Engineering Program

**Specialization** Production and Computer Aided Manufacturing Technology  
**Course Number** 02020201  
**Course Title** **Computer-Aided Design and Programming Workshop (CAD)**  
**Credit Hours** (2)  
**Theoretical Hours** (0)  
**Practical Hours** (6)

**Brief Course Description:**

This course is designed to develop the student's ability in the programming, set-up, and operation of Computerized Numerical Control machine tools as well as construct basic operation programs.

**Course Objectives:**

At the end of this course student will be able to:

1. Write CNC programs with subroutine
2. Write CNC programs with full cycle
3. Write CNC programs with surface finishing
4. Design 3D works

**Detailed Course Description:**

Number	Title	Content	Time
	Introduction to numerical control NC and CNC systems		
	Structure of NC and CNC systems		
	Applications of NC systems	Types of NC systems NC part programming Programming languages G-M-Codes and functions Key issues of NC programming Programming modes Tool path Units Tool programming Zero setting Compensations Machine setup	
	NC part program introducing	Interpolation Program test (simulation mode) and machining mode Operator monitor Dwell time Subroutine call Polygon programming Tool path correction Face turning Redrawing cycle Threading Industrial machine registry Peripheral instrument programming PC design tutorial and NC programming NC part programming	
	Creating 2D geometry	Tool path contour Chamfer	

		Roughing and finishing passes Rotating geometry and tool path Creating drill tool paths	
	CNC Lathe machine	installing cycling programs with subroutines	
	CNC Machining Center	installing cycling programs with subroutines	
	CNC wire cutting machine	installing cycling programs with subroutines	
	Mastercam	3D designs	
	Examples of 2D/3D part programming.		

**Evaluation Strategies:**

<b>Evaluation</b>		<b>Percentage</b>	<b>Date</b>
Exams	Midterm	20%	
	Final Exam	50%	
Projects and Assignments and reports		30%	

**Teaching Methodology:**

- Lecturing
- Technical videos watching
- Workshop practicing

**Text Books & References:**

**Text Books:**

- CNCCAD/CAM manuals
- Provided workshop manual and related supplemental sheets

**References:**

- Groover, Fundamentals of Modern Manufacturing, 4th Ed
- CNC 800T programming manual
- MTC software CNC turning
- EMCO technics, programming instr. Emcotronic T2
- Metalwork Technology and practice, Victor E. Repp, USA