SHIVAJI UNIVERSITY KOLHAPUR

CENTER FOR COMMUNITY DEVLOPMENT

CERFICIATE COURSE IN C N C (Credit-4)

1	**Name of Syllabus**	**Certificate course in CNC**
2	**Duration**	1 year
3	**Expected number of students**	30 student
4	**Course fees per student**	Course Fees Rs5000+ Evaluation Rs.250/-
5	**Medium of instruction**	English and Marathi
6	**Eligibility**	10^{th} pass or equivalent
7	**Required infrastructure**	Well equipped lathe machine & CNC workshop with tools & equipment
8.	**Subject**	1. Introduction to CNC 2. CNC in programming
9	**Evaluation**	1) Theory 2 papers = 200 marks 2) Practical 1 paper = 100 marks 3) Internal 1 paper = 100 marks 4 Grand Total = 400 marks
10	**Objective**	1) Achieving desired part dimensions and tolerances: This involves accurately setting and running the machine to produce parts within specified dimensions and quality standards. 2) Selecting appropriate tools and materials: Choosing the correct cutting tools, workpieces, and machine settings for a specific job. 3) Maintaining machine safety and operation: Ensuring proper machine setup, operation, and cleaning, as well as adhering to safety protocols. 4) Troubleshooting and resolving machine issues: Identifying and fixing problems that arise during the machining process. 5) Optimizing production efficiency: Working to maximize output while maintaining quality, potentially through process improvements or programming adjustments.
11	**Skill to be provided**	Aside from progressing in a **turner** role, you can take alternative career paths to **learn** new **machining** techniques like **milling** or operating manual lathe.
12	**Employment opportunities**	CNC turner, CNC machinist, or CNC operator in various industries.

Title Of Paper	Credit	Theory	Practical	Internal	Total
Safety, Units of measuring instruments	**2**	**100**	**50**	**50**	**200**
Cutting tools and Holding Devices	**2**	**100**	**50**	**50**	**200**
	04	**200**	**100**	**100**	**400**

1) **Theory Exam – Totally objective**
2) **Practical Exam- Actual Demo. Identification, Oral**
3) **Internal Exam- Attendances, Class performance, Project, field visits,**

1) Introduction to CNC (SAFETY & MEASURING TOOLS)

<table>
<tr><td rowspan="2">Course Code :</td><td>SAFETY & MEASURING TOOLS</td><td>Credit : 2</td><td>Marks : 100</td></tr>
<tr><td>Total hours of teaching with practical 60 hr</td><td>External 50</td><td>Internal 50</td></tr>
<tr><td>Course Outcomes :</td><td colspan="3">A course on safety and measuring tools should equip students with the ability to safely operate various tools, understand their proper use, and perform accurate measurements. This includes identifying hazards, using appropriate safety equipment, and selecting the right tool for the job, ultimately leading to safer and more efficient work practices</td></tr>
<tr><td>Unit No.</td><td colspan="2">Description</td><td>No. Of Periods</td></tr>
<tr><td>1.SAFETY</td><td colspan="2">General safety
Personal safety</td><td>Th - 5
Pr - 10</td></tr>
<tr><td>2.UNITS OF MEASUREMENTS
MEASURING INSTRUMENT
CUTTING TOOLS
HOLDING DEVICE</td><td colspan="2">1.1 British & Metric systems
Micrometre
1.2 Varner caliper, Height Gauge, steel rule, try square slip gauge
1.3Outside, Combination set, try square marking tools, Scriber
1.4 Scribing block, surface plate, Angel plate, veer-block
1.5 Marking media
Hacksaw blade
File description
Drill
Bench vice, Machine vice
Nuts & blots
Use of tap & die material for tap & die safety precautions while tapping</td><td>Th- 5
Pr -10</td></tr>
<tr><td>3.GENERAL HAND TOOLS
ENGINEERING FASTENER</td><td colspan="2">Screw driver, spanners
Metric BSW, BSP, BA
Types of screw, Hexagonal
Nuts & bolts washers</td><td>Th- 5
Pr- 10</td></tr>
<tr><td>4.LATHE MACHINE SPECIFICATION
TYPES OF LATHE MACHINE
LATHE OPERATIONS</td><td colspan="2">• Function of lathe machine
• Lathe machine main parts
• Tall stock (Tail Stock)
• Carriage
• Lead screw
• Capstan lathe &turret lathe
Understand basic common lathe operation</td><td>Th- 5
Pr -10</td></tr>
</table>

2) CNC in programming

Course Code :	Introduction to CNC	Credit : 2	Marks : 100
	Total hours of teaching with practical : 60	External 50	Internal 50
Course Outcomes :	Upon completing an introduction to CNC course, a student will understand the basic principles of CNC technology and be able to apply them in practical settings. They will gain knowledge of CNC machine operation, programming (G-codes and M-codes), and various machining processes. The course will also cover topics like coordinate systems, tool movement, and how to prepare and simulate CNC programs		
Unit No.	Description		No. Of Periods
CNC	NC, CNC, & DNC machines Advantages & disadvantages of CNC machines Parts suitable for CNC Classification of CNC machines Axis identification of CNC machines		Th 5 Pr 10
PROCESS PLANNING	Special features of CNC machines, machines structure Keyboard details of computer unit & operations Safety precautions, operational requirements for CNC machines tools, tools offset jaw turning, jaw boring etc. CNC words G codes & M codes Canned cycles used in CNC as per Fanuc control system		Th 5 Pr 10
CNC PROGAMMING	Part of programming in CNC words with programming format Co-ordinate systems Miscellaneous functions Use of Modes in programming Simple programming examples of drilling, milling & lathe machines Use of G40, G41& G42 codes		Th 5 Pr 10
CANNED CYCLES	Study & use of Canned cycles in CNC lathe & milling machine as per Fanue controls Programming using canned cycles in lathe machines Programming using canned cycles in milling & drilling machines Main programs & sub-programs Examples on programming Introduction to computer aided programming Advantages of computer aided programming		Th 5 Pr 10

Books to be refer :

1. "CNC Programming Handbook" by Peter Smid
2. "The Lathe Book: A Complete Guide to the Machine and Its Accessories" by Ernie Conover