

**DEPARTMENT OF PRODUCTION ENGINEERING  
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI**

COURSE PLAN – PART I			
<b>Course Title</b>	CNC Technology		
<b>Course Code</b>	PR 605	<b>No. of Credits</b>	03
<b>Course Code of Pre-requisite subject(s)</b>	---		
<b>Session</b>	Jan. 2021	<b>Section (if, applicable)</b>	---
<b>Name of Faculty</b>	Dr J Jerald	<b>Department</b>	Production Engg.
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<b>Course Type</b>	<input checked="" type="checkbox"/> Core course		
<b>Syllabus (approved in BoS)</b>			
<p><b>Numerical Control (NC) - input media - design considerations of NC machine tools - functions of MCU- controls and system devices – CNC.</b></p> <p><b>CNC programming- manual part programming – preparatory, miscellaneous functions – computed aided part programming - post processors - APT programming- programming for CNC turning center, machining center and CNC EDM.</b></p> <p><b>Feedback devices– interpolators - tooling for CNC– point-to-point and contouring systems – DNC-Adaptive Control – ACO and ACC systems- graphical numerical control.</b></p> <p><b>Automation – principles – strategies – levels of automation – automated manufacturing systems– devices, drives and control circuits in automation - semi-automats, automats and transfer lines.</b></p> <p><b>Part families-classification and coding-cellular manufacturing- production flow analysis - automated material handling systems- automated storage systems-automatic data capture- automated assembly systems-industrial robots – configurations- applications.</b></p> <p><b>REFERENCES:</b></p> <ol style="list-style-type: none"> <li><b>1. YoramKoren, "Computer Control of Manufacturing Systems", McGraw Hill Book Co. New Delhi, 1986.</b></li> <li><b>2. Mikell P. Groover, "Automation, Production Systems and Computer Integrated Manufacturing", Prentice Hall of India, 2009.</b></li> <li><b>3. Radhakrishnan P., "Computer Numerical Control Machines", New Book Agency, Calcutta,1991.</b></li> <li><b>4. Kundra T. K., Rao P. N., and Tiwari N. K., "CNC and Computer Aided Manufacturing", Tata McGraw Hill, New Delhi, 1991.</b></li> <li><b>5. Fitzpatric.M., "Machining and CNC Technology", McGraw Hill, 2004</b></li> </ol>			

**COURSE OBJECTIVES:**

To develop advanced machine language for operating machine tools.  
 To apply computer numerical control techniques for making macro and micro products.  
 To understand cellular manufacturing techniques.

**COURSE OUTCOMES (CO)**

Course Outcomes	Aligned Programme Outcomes (PO)
1. Develop advanced machine language for operating machine tools	1,4
2. Apply computer numerical control techniques for making macro and micro products.	3,5,6,7
3. Understand cellular manufacturing techniques.	8,9,11

**COURSE PLAN – PART II****COURSE OVERVIEW**

This course is to teach the concepts of CNC Technology and various associated benefits including automation in manufacturing and automated material handling and so on.

**COURSE OBJECTIVES**

S.No.	Week/Contact Hours	Topic	Mode of Delivery
1	Week 1	Numerical Control (NC) - input media - design considerations of NC machine tools.	PPT / Online
2	Week 2	Functions of MCU- controls and system devices – CNC.	PPT / Online
3	Week 3	CNC programming- manual part programming – preparatory, miscellaneous functions	PPT / Online
4	Week 4	Computed aided part programming - post processors - APT programming	PPT / Online
5	Week 5	Programming for CNC turning center, machining center and CNC EDM.	PPT / Online
6	Week 6	Feedback devices– interpolators - tooling for CNC	PPT / Online
7	Week 7	Point-to-point and contouring systems – DNC-Adaptive Control	PPT / Online
8	Week 8	ACO and ACC systems- graphical numerical control.	PPT / Online
9	Week 9	Automation – principles – strategies – levels of automation – automated manufacturing systems	PPT / Online
10	Week 10	Part families-classification and coding-cellular manufacturing-production flow analysis.	PPT / Online
11	Week 11	Automated material handling systems- automated storage systems	PPT / Online

12	Week 12	Automatic data capture- automated assembly systems	PPT / Online
13	Week 13	Industrial robots – configurations-applications.	PPT / Online

**COURSE ASSESSMENT METHODS**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test-I	Week-6	1 ½ Hours	25%
2	Cycle Test-I	Week-12	1 ½ Hours	25%
3	Assignment/Seminar/Quiz	---	---	20%
CPA	Compensation Assessment (Both CT1 & CT2 portions)	Week-14	1 ½ Hours	
4	Final Assessment	Week-15	2 Hours	30%

**COURSE EXIT SURVEY**

- Feedback will be collected from students during the semester and also in class committee meetings
- End semester feedback on course outcome

**COURSE POLICY:**

**MODE OF CORRESPONDENCE (email/ phone etc):**

- Preferred mode of correspondence with students by email/ phone

**ATTENDANCE:**

- 85% attendance is compulsory to attend the end semester examination

**COMPENSATION ASSESSMENT:**

- Retest will be conducted for students who get prior permission under genuine purpose.

**ACADEMIC HONESTY & PLAGIARISM**

- Copying in any form in assessments is considered as academic dishonesty and will attract suitable penalty.

**ADDITIONAL INFORMATION: Nil**

**FOR APPROVAL**

Course Faculty  05.02.2021

CC-Chairperson  05.02.2021

HOD 