DEPARTMENT OF PRODUCTION ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Course Title	CNC Technology		
Course Code	PR 605	**No. of Credits**	03
Course Code of Pre-requisite subject(s)	---		
Session	Jan. 2023	**Section (if, applicable)**	---
Name of Faculty	Dr J Jerald	**Department**	Production Engg.
Email	jerald@nitt.edu	**Telephone No.**	0431-2503518
Name of Course Coordinator	Dr. Prakash Kumar		
E-mail	prakashkumar@nitt.edu	**Telephone No.**	---
Course Type	Core course		

Syllabus (approved in BoS)

Numerical Control (NC) - input media - design considerations of NC machine tools - functions of MCU- controls and system devices – CNC.

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.

Feedback devices– interpolators - tooling for CNC– point-to-point and contouring systems – DNC-Adaptive Control – ACO and ACC systems- graphical numerical control.

Automation – principles – strategies – levels of automation – automated manufacturing systems– devices, drives and control circuits in automation - semi-automats, automats and transfer lines.

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.

REFERENCES:

1. YoramKoren, "Computer Control of Manufacturing Systems", McGraw Hill Book Co. New Delhi, 1986.
2. Mikell P. Groover, "Automation, Production Systems and Computer Integrated Manufacturing", Prentice Hall of India, 2009.
3. Radhakrishnan P., "Computer Numerical Control Machines", New Book Agency, Calcutta,1991.
4. Kundra T. K., Rao P. N., and Tiwari N. K., "CNC and Computer Aided Manufacturing", Tata McGraw Hill, New Delhi, 1991.
5. Fitzpatric.M., "Machining and CNC Technology", McGraw Hill, 2004

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.	CT/PPT
2	Week 2	Functions of MCU- controls and system devices – CNC.	CT/PPT
3	Week 3	CNC programming- manual part programming – preparatory, miscellaneous functions	CT/PPT
4	Week 4	Computed aided part programming - post processors - APT programming	CT/PPT
5	Week 5	Programming for CNC turning center, machining center and CNC EDM.	CT/PPT
6	Week 6	Feedback devices– interpolators - tooling for CNC	CT/PPT
7	Week 7	Point-to-point and contouring systems – DNC-Adaptive Control	CT/PPT
8	Week 8	ACO and ACC systems- graphical numerical control.	CT/PPT
9	Week 9	Automation – principles – strategies – levels of automation – automated manufacturing systems	CT/PPT
10	Week 10	Part families-classification and coding-cellular manufacturing-production flow analysis.	CT/PPT
11	Week 11	Automated material handling systems- automated storage systems	CT/PPT
12	Week 12	Automatic data capture- automated assembly systems	CT/PPT

13	Week 13	Industrial robots – configurations-applications.		CT/PPT

COURSE ASSESSMENT METHODS

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Cycle Test-I	Week-6	I ½ Hours	20%
2	Cycle Test-I	Week-12	I ½ Hours	20%
3	Assignment/Seminar/Quiz	---	---	10%
CPA	Compensation Assessment (Both CT1 & CT2 portions)	Week-14	1 ½ Hours	
4	Final Assessment	Week-15	2 Hours	50%

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:
- 75% attendance is compulsory to attend the end semster 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 _____   **CC-Chairperson** _____   **HOD** _____
                                            Dr. Prakash Kumar