GOVERNMENT OF TAMILNADU
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI
STATE PROJECT COORDINATION UNIT
(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	**MASTER CAM**
Course Code	ME/2020/010
Course Duration	60 Hours
Minimum Eligibility Criteria	ITI/10th/+2/Diploma/Graduates
Pre-requisites (if any)	-
Course Objectives	Training module has been designed for the participants to • Learn the 3D wire frame geometric creation, surface and solid modeling, dimensioning of the Master CAM. • Study the various associative contouring, Zigzag and one way pocketing, Drilling toolpath verification. • Study the full machine simulation and the ability of synchronize multiple code. • Understand the Design, solid and 2-axis fully associative turning functionally and full tool path verification.
Course Outcomes	At the end of training, the participants will be able to • Explain the concept of 2-3 axis single surface machining plus limited multi-surface rough pocketing verification. • Illustrate the working of 2- axis and 4-axis package for wire EDM applications. • Outline the shape blending, conversion of 2D artwork into machinable geometry, plus exclusive fast tool path. • Explain the support for router specific functions aggregate nesting and solids patterning.
Expected Job Roles	Design Engineer in Product Design and Development industries

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of the Examination
				Min	Max	
ME/2020/010	**MASTER CAM**	Theory	30	10	20	3 Hours
		Practical	30	40	80	
		Total	60	50	100	

ME/2020/010 - MASTER CAM

DETAILED SYLLABUS

Unit No.	Modules	No. of Hours	
		Theory	Practical
I	**Introduction to Master CAM:**	**04 Hours**	
1.1	Menu bars -file creation-open -save-save as	02	
1.2	Point -Line -Rectangle -Arc -Circle -Fillet -Chamfer	02	
II	**Editing of Sketches:**	**08 Hours**	
2.1	Construction planes -Geometric views- Zoom – Pan -Dynamic -Rotation -Delete -Undo	04	
2.2	Shading -Screen statistics – Mirror -Translate – Rotate -Offset -Scale -Screen Configuration	04	
III	**Modifying Sketches:**	**08 Hours**	
3.1	Trim -Divide -Extend -Break – Dimension Creation- Introduction to Solid Modeling	04	
3.2	Extrude -Create body -Cut body -Add bass -thin wall -Solid revolve -Sweep -fillet -Chamfer -Shell -Solid Manager	04	
IV	**Introduction to Surface Modeling:**	**21 Hours**	
4.1	Loft -Surface creation -Primitives Cylinder -Block -Sphere -Boolean operations	06	
4.2	**Practical:** ➢ 2-Axis Machining(lathe) - Facing -Rough Turning -Finish turning -Job setup- Quick operations		08
4.3	**Practical:** ➢ Grooving-Drilling -verification -Simulation -post processing		07
V	**Importing and Exporting:**	**19 Hours**	
5.1	Data translation -Step -Iges -Prt -Layout Creation -simple practices	04	
5.2	**Practical:** ➢ 3-Axis Machining (VMC) - Contour Milling -Drilling -Face milling (2D profiles) -Pocket milling -practices -Surface milling -rough and finish -Parallel -Radial		08
5.3	**Practical:** ➢ Flow line -Contour milling -pocket milling and plunge milling (3D profile) -finish milling-post processing -verification -valedictory function		07
	Total Theory and Practical hours	**30**	**30**
	Total hours	**60**	

HARDWARE REQUIREMENT

S. NO.	LIST OF TOOLS /EQUIPMENTS
1.	Desktop Computer: Intel Core i7-9700,(8 Core, 12MB Cache, 3.0Ghz, 4.7 Ghz Turbo w/UHD Graphics 630) DirectX Graphics card 16GB, 2X8G, DDR4 2666MHz Non-ECC Memory M.2 256GB PCIe NVMe Class 40 SSD 3 Button Optical mouse with scroll option 101MM Keyboard ergonomically deigned
2.	Laser Printer
3.	UPS with power backup for 30 minutes

SOFTWARE REQUIREMENT

S. NO.	LIST OF SOFTWARE
1.	Master CAM / Edge CAM Software

REFERENCE BOOKS

S. NO.	NAME OF THE BOOK	AUTHOR	PUBLISHER
01	Learning Master cam X5 Mill 2D Step-by-step	James V. Valentino	Industrial Press Inc.,U.S.; Pap/DVD edition (16 June 2011)
02	Learning Master cam X Mill Step by Step in 2D	Joseph Goldenberg	Industrial Press Inc.,U.S.; Pap/Cdr/Co edition (1 January 2006)

ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training , Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

END EXAMINATION

ALLOCATION OF MARKS

S.NO	Description	Max.Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Aim and Procedure	20
	b)Demonstration / Execution	25
	c) Result & Viva Voce	15
	d)Record	20
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

ME /2020/010 - MASTER CAM

(Maximum Marks: 20)

(N.B: Answer any **Twenty** questions) **20x1= 20 Marks**

1. What is meant by CAM?
2. List out the functions of master CAM.
3. What is the use of graphics window?
4. What is the use of selection bar?
5. What is dynamic gnomon?
6. How to draw the line in Master CAM.
7. List out geometrical views.
8. What is meant by C-planes?
9. How to use of T-planes.
10. What is meant by screen statistics?
11. What is meant by screen surf disp-shading?
12. Write down the meaning of .nci file.
13. Write down the meaning of 2D tool contour.
14. What is the meaning of cutter compensation?
15. How many axes in CNC Lathe.
16. Write down any two editing tools.
17. What is the meaning of Xform-Mirror?
18. What is the meaning of Xform-Translate?
19. Write down the meaning of solid modelling.
20. Write down the meaning of impression.
21. What is surface modelling?
22. What is meant by post processing?
23. What is the meaning of pocket milling?
24. List out the benefit of CAM software.
25. What is the meaning of verification?