MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI -51

<table>
<tr><td>1</td><td>Name of Syllabus</td><td>C. C. In CAD-CAM OPERATOR
(303127)</td></tr>
<tr><td>2</td><td>Max. No of Student</td><td>25 Students</td></tr>
<tr><td>3</td><td>Duration</td><td>6 Month</td></tr>
<tr><td>4</td><td>Type</td><td>Part Time</td></tr>
<tr><td>5</td><td>No Of Days / Week</td><td>6 Days</td></tr>
<tr><td>6</td><td>No Of Hours /Days</td><td>4 Hrs</td></tr>
<tr><td>7</td><td>Space Required</td><td>Practical Lab = 200 Sq feet
Class Room = 200 Sq feet
TOTAL = 400 Sq feet</td></tr>
<tr><td>8</td><td>Entry Qualification</td><td>S.S.C. Pass</td></tr>
<tr><td>9</td><td>Objective Of Syllabus/ introduction</td><td>To make available CAD-CAM operators with the capability of handling CNC machines efficiently.</td></tr>
<tr><td>10</td><td>Employment Opportunity</td><td>A successful candidate can complete the job as follows :
a. Designing drafting and printing new drawings,
b. Digitizing of old drawing
c. Operation and programming on CNC machines.
To work in CNC environment.</td></tr>
<tr><td>11</td><td>Teacher’s Qualification</td><td>Teacher should be graduate / diploma in any engineering stream with in-depth knowledge of higher end CAD software and technology with minimum 2 years experience.</td></tr>
<tr><td>12</td><td>Training System</td><td>Training System Per Week
<table>
<tr><td>Theory</td><td>Practical</td><td>Total</td></tr>
<tr><td>06 Hours</td><td>18 Hours</td><td>24 Hours</td></tr>
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<tr><td>13</td><td>Exam. System</td><td>
<table>
<tr><th>Sr. No.</th><th>Paper Code</th><th>Name of Subject</th><th>TH/PR</th><th>Hours</th><th>Max. Marks</th><th>Min. Marks</th></tr>
<tr><td>1</td><td>30312711</td><td>COMPUTER AIDED DRAFTING AND DESIGN</td><td>TH-I</td><td>3 hrs.</td><td>100</td><td>35</td></tr>
<tr><td>2</td><td>30312712</td><td>COMPUTER AIDED MANUFACTURING</td><td>TH-II</td><td>3 hrs.</td><td>100</td><td>35</td></tr>
<tr><td>3</td><td>30312721</td><td>COMPUTER AIDED DRAFTING AND DESIGN</td><td>PR-I</td><td>3 hrs.</td><td>100</td><td>50</td></tr>
<tr><td>4</td><td>30312722</td><td>COMPUTER AIDED MANUFACTURING</td><td>PR-II</td><td>3 hrs.</td><td>100</td><td>50</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>400</td><td>170</td></tr>
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2 D Drafting for Modeling –

Lines, Circles Arcs Dimensioning, Fillet, Make corner, trim extend, divide at, merge curves, scale, and move, rotate, drag, modify, delete, offset.

3 D Solid Modeling –

Sketch in place, reference plane, extrusion, revolve, reflect patterning, rectangular and circular, filet, chamfer, shell, draft, Boolean Operation, cut join, intersect, plane cut, partition material side, history access, align, display filters, appearance, properties, manage bins, viewing, bin-put away get modify reference point measure.

Basic 3 D Surface Modeling –

Basic loft, sweep by boundary.

Advance 3 D Surface Modeling –

Co-ordinate systems, extract, cross-section, build section, 3 D Line, 3 D Arcs, 3 D circles, 3 D splines, points on curve, trim at curve divide edge, surface extension, surface intersection, ISO curve, blend fillet, variation sweep, mesh of curves, clean surface or curves, surface explosion, project curve, properties,

Assembly –

Create parts, name parts, create assemble, add parts to assemble, select parts, dimensioning and containing instances assemble exploding Browse Relations, configurations sequences, animation, suppressing and unsurprising, interference checking.

THEORY PAPER – II - COMPUTER AIDED MANUFACTURING (CAM)

Introduction Generative Machining

Milling Operations

a) Volume Clear Operation
b) Copy Mill Operations
c) Profile Operations
d) Following Operations
e) Manual Operations

Turning Operations

a) Facing Semi-finish / Finish Operations
b) Turning Semi-finish / Finish Operations
c) Groove Cutting Operations
d) Thread Cutting Operations

Machine Technology

Metal Cutting Process:-

Types of machines used for metal cutting. Automation and its stages measures. To increase manufacturing efficiency in metal cutting. Conventional machine operations.

PRACTICAL I, COMPUTER AIDED DRAFTING & DESIGNING (CAD)

2 D Drafting for Modeling –

Lines, Circles Arcs Dimensioning, Fillet, Make corner, trim extend, divide at, merge curves, scale, and move, rotate, drag, modify, delete, offset.

3 D Solid Modeling –

Sketch in place, reference plane, extrusion, revolve, reflect patterning, rectangular and circular, filet, chamfer, shell, draft, Boolean Operation, cut join, intersect, plane cut, partition material side, history access, align, display filters, appearance, properties, manage bins, viewing, bin-put away get modify reference point measure.

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Assembly –

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PRACTICAL II , COMPUTER AIDED MANUFACTURING (CAM)

Introduction Generative Machining

Milling Operations

f) Volume Clear Operation
g) Copy Mill Operations
h) Profile Operations
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Turning Operations

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LIST OF TOOLS / EQUIPMENTS/SOFTWARE

Sr. No.	Description of Tools/Equipment/Software	Nos. Required
1	Pentium based processor having minimum configuration • Min 3.00 GHZ Dual core Mother board • 350 GB HDD • 2 GB RAM • DVD WRITTER DRIVE • LCD 17”	Four
2	Lathe Machine	One
3	Milling Machine	One
4	Dot Matrix Printer	One
5	Desk / Ink Jet Printer or Plotter	One
6	Windows XP or higher version CAD-CAM Software, Graphics Simulation Package.	As Required
7	256 KBPS External Modem	One

Reference Books:

1.	Computer Numerical Control	Aurther Gill
2.	Numerical Control	Rojer Macrill
3.	CAD-CAM an Automation	Rachayya R.A.
4.	CNC Training	Satish Joshi

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