

MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION, MUMBAI - 51

1	Name of Course	Certificate Course in Architectural & Civil Using Auto CAD (101137)																																															
2	Max. Nos. of Student	25 Students																																															
3	Duration	6 Months																																															
4	Type	Part Time																																															
5	Nos. of Days / Week	6 Days																																															
6	Nos. of Hours /Days	4 Hrs																																															
7	Space Required	Theory Class Room – 200 sqft Practical – 200 sqft Total – 400 sqft																																															
8	Entry Qualification	H.S.C. + Any course from computer group Pass of MSBVEE																																															
9	Objective Of Syllabus/ introduction	On completion of the course a student should have – a. Gain knowledge in 2D engineering drafting b. Apply this knowledge to understand the engineering design work flow process in the Industry c. Acquire knowledge of basic 3D modeling concepts																																															
10	Employment Opportunity	CAD operator in the Architectural and Civil Industry																																															
11	Teacher's Qualification	Degree / Diploma in Computer Science & Engg.																																															
12	Training System	Training System Per Week																																															
		Theory		Practical		Total																																											
		6 Hours		18 Hours		24 Hours																																											
13	Exam. System	<table border="1"> <thead> <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> </thead> <tbody> <tr> <td>1</td> <td>10113711</td> <td>Fundamentals of Drafting</td> <td>TH-I</td> <td>3 hrs</td> <td>100</td> <td>35</td> </tr> <tr> <td>2</td> <td>10113712</td> <td>CADD</td> <td>TH-II</td> <td>3 hrs</td> <td>100</td> <td>35</td> </tr> <tr> <td>3</td> <td>10113721</td> <td>Fundamentals of Drafting</td> <td>PR-I</td> <td>3 hrs</td> <td>100</td> <td>50</td> </tr> <tr> <td>4</td> <td>10113722</td> <td>CADD</td> <td>PR-II</td> <td>3 hrs</td> <td>100</td> <td>50</td> </tr> <tr> <td></td> <td></td> <td>Total</td> <td></td> <td></td> <td>400</td> <td>170</td> </tr> </tbody> </table>						Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	10113711	Fundamentals of Drafting	TH-I	3 hrs	100	35	2	10113712	CADD	TH-II	3 hrs	100	35	3	10113721	Fundamentals of Drafting	PR-I	3 hrs	100	50	4	10113722	CADD	PR-II	3 hrs	100	50			Total			400	170
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Syllabus

Theory & Practical - I Fundamentals of Drafting

Sr. No.	Contents	Learning Outcomes
1.	Drawing Basics	To be able to draw basic forms and shapes which are fundamentals for further drawing sessions
2.	Perspectives and Design Fundamentals	Good understanding of design theory, Perspective drawing, shading techniques
3.	Architecture Design and walkthroughs	Understanding the Design for Architectural walkthroughs with output formats and presentation standards
4.	Digital Imaging	Designing images and textures especially for 3D visualization
5.	Understanding AutoCAD Drawings	Basic understanding and usage of AutoCAD and converting AutoCAD files to 3DS Max format
6.	Drawing CAD – 2D	<p>Start up methods, use of various functions keys.</p> <p>Various modes in CAD, creating drawing environment, understanding co-ordinate system, types of co-ordinate.</p> <p>Draw commands : Line, Ray, Constructing Line, Spline, Polly line, multiline.</p> <p>Rectangle, polygon, circle, arc, ellipse, donut, point , commands.</p> <p>Modify commands : copy, move, erase, oops, scale, rotate, stretch, lengthen, break, trim, extend, chamfer, fillet, mirror, offset, align explode, array commands, editing pollyline, editing multiline, listing properties, matching properties, setting drawing units, drawing limit format point style, text style, dimension style, multiline style. Using creating & editing single line and multi line text.</p> <p>Dimensioning technique commands (complete)</p> <p>Block & W-block commands, patch boundary, region command, object property concepts, model space paper space concept various zooming command, object snapping/tracking feature, display order, inquiry commands printing/plotting parameters, printing & plotting procedure, using scale in printing.</p>

Theory & Practical - II

Computer Aided Drafting & Design

Sr. No.	Topic
1.	Instruct students in modern graphics & modeling fundamentals for engineering design. Students will be introduced to freehand sketching, multi-view orthographic projection, shape modeling & it's applications in computer aided drafting & design (CADD). Studies will include graphic geometry & projection techniques, visualization methods, pictorial drawings, geometric modeling techniques for CADD drafting practices & manufacturing process & materials documentation.
2.	Introduction to standard based 2D drafting (Based on international standards for representation & confirmation) & 3D design.
3.	<p>Introduction to 3D drawing</p> <p>Viewing 3D drawing –creating view ports, named view ports, hidden view, shade mode view. Ariel view, plan view, isometric view, orthographic view, floating view ports, display image commands.</p> <p>Using co-ordinate system :- named UCS, orthographic move UCS, new UCS, using point filter.</p> <p>Creating 3D solid-creating basic solid like box, cylinder etc. extrude, revolve, slice, section, interference, Boolean operation – union subtract, intersect command, creating 3D surface- 2D surface, 3D surface, 3D face, 3D mesh, revolved surface, tabulated surface, ruled surface, edge surface, extrude/move/offset/delete/rotate/taper/colour/ copy/copy face command, 3D array, mirror 3D, rotate 3D command.</p> <p>Rendering – rendering scene, adding background, using light effect, applying material & landscaping .</p>

List of tools / equipments / softwares :

Sr.No.	Description of tools / equipments / softwares	Nos. required
1.	Pentium based processor having minimum configuration <ul style="list-style-type: none"> • Min.400 MHZ • 160 GB HDD • 1 GB RAM • 1.44 MB floppy drives • 48 x CD-ROM Drive • SVGA colour monitors with VGA (8 mb) 	Four
2.	136 column dot matrix printer	One
3.	Desk/Ink Jet printer	One
4.	Windows 98 or NT or Higher version Auto CAD software.	As required

Reference Books :

1.	Inside AutoCAD	D. Raker & H Rice
2.	Reference manual of AUTOCAD	Autodesk
3.	Programming in Auto Lisp	Y. I. Shah & C. Patel