

**MAHARASHTRA STATE BOARD OF VOCATIONAL EDUCATION EXAMINATION,  
MUMBAI - 51**

1	Name of Course	<b>Certificate Course in Basic Civil Engineering</b>																																							
2	Course Code	304117																																							
3	Max. Nos. of Student	25 Students																																							
4	Duration	6 Months																																							
5	Type	Part Time																																							
6	Nos. of Days /	6 Days																																							
7	Nos. of Hours	4 Hrs																																							
8	Space Required	Laboratory = 1000 Sq feet Class Room = 200 Sq feet <b>TOTAL = 1200 Sq feet</b>																																							
9	Entry	<b>VII<sup>th</sup> Passed</b>																																							
10	Objective Of Syllabus/ introduction	<ul style="list-style-type: none"> <li>• To understand basics of civil engineering</li> <li>• Understand area &amp; volume concept in this field</li> <li>• To understand basic of engineering drawing</li> </ul> To understand civil activities like Plumbing, tiling.																																							
11	Employment Opportunity	The trainee will either to be able to take up jobs with agencies which maintain and repair such equipments or with working experience will be in a position to start his own independent Business.																																							
12	Teacher's Qualification	Diploma in Civil Engineering.																																							
13	Training System	Training System Per Week																																							
		<table border="1"> <thead> <tr> <th>Theory</th> <th>Practical</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>6 Hours</td> <td>18 Hours</td> <td>24 Hours</td> </tr> </tbody> </table>					Theory	Practical	Total	6 Hours	18 Hours	24 Hours																													
Theory	Practical	Total																																							
6 Hours	18 Hours	24 Hours																																							
14	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><b>30411711</b></td> <td>Basic Civil</td> <td>TH-I</td> <td>3 hrs.</td> <td>100</td> <td>35</td> </tr> <tr> <td>2</td> <td><b>30411721</b></td> <td>Basic Civil Engineering. &amp; Materials</td> <td>PR-I</td> <td>6 hrs.</td> <td>200</td> <td>100</td> </tr> <tr> <td>3</td> <td><b>30411722</b></td> <td>Basic Engineering. Drawing. &amp; Plumbing</td> <td>PR-II</td> <td>3 hrs.</td> <td>100</td> <td>50</td> </tr> <tr> <td></td> <td></td> <td><b>TOTAL</b></td> <td></td> <td></td> <td><b>400</b></td> <td><b>185</b></td> </tr> </tbody> </table>					Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks	1	<b>30411711</b>	Basic Civil	TH-I	3 hrs.	100	35	2	<b>30411721</b>	Basic Civil Engineering. & Materials	PR-I	6 hrs.	200	100	3	<b>30411722</b>	Basic Engineering. Drawing. & Plumbing	PR-II	3 hrs.	100	50			<b>TOTAL</b>			<b>400</b>	<b>185</b>
Sr. No.	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Min. Marks																																			
1	<b>30411711</b>	Basic Civil	TH-I	3 hrs.	100	35																																			
2	<b>30411721</b>	Basic Civil Engineering. & Materials	PR-I	6 hrs.	200	100																																			
3	<b>30411722</b>	Basic Engineering. Drawing. & Plumbing	PR-II	3 hrs.	100	50																																			
		<b>TOTAL</b>			<b>400</b>	<b>185</b>																																			

## SYLLABUS

### Theory Paper – I Basic Civil

Sr. No.	Topic
1.	<p>Engineering Drawing :</p> <ul style="list-style-type: none"><li>• Drawing Instruments</li><li>• Geometrical Construction</li><li>• Bisecting a line</li><li>• Division of lines</li><li>• Arcs of Circles</li><li>• Equilateral triangles</li><li>• Squares</li><li>• Regular Polygons</li></ul>
2.	<p>Construction :</p> <ul style="list-style-type: none"><li>• Meaning</li><li>• Types of Construction/structures – load bearing and framed structures</li><li>• Building Components – foundation, plinth, walls etc.</li><li>• Stone Masonry – Meaning</li><li>• Tools used in stone masonry</li><li>• Brick Masonry – Meaning</li><li>• Tools used in brick masonry</li></ul>
3.	<p>Materials :</p> <ul style="list-style-type: none"><li>• Stones – Classification of rocks</li><li>• Uses of stones</li><li>• Bricks – Classification of bricks</li><li>• Uses of bricks</li><li>• Qualities of good brick.</li><li>• Lime – Sources of lime</li><li>• Classification of lime</li><li>• Uses of lime</li></ul>
4.	<p>Electronics :</p> <ul style="list-style-type: none"><li>• Sources of power</li><li>• Kerchief's Law</li><li>• Ohm's law</li><li>• Components – Resistors</li><li>• Capacitors</li><li>• Inductors</li><li>• Transformer</li></ul>

5.	<p>Electrical :</p> <ul style="list-style-type: none"> <li>• Electricity</li> <li>• Charge</li> <li>• Current</li> <li>• Resistance</li> <li>• Direct current (D.C.)</li> <li>• Alternating current (A.C.)</li> <li>• Power</li> <li>• Energy</li> <li>• Domestic Appliances – Electric Iron, Geyser</li> <li>• Electrical wiring – types</li> </ul>
6.	<p>Computer :</p> <ul style="list-style-type: none"> <li>• Introduction to Computer</li> <li>• History of computers</li> <li>• Types or Classification of computer</li> <li>• Study of input / output devices</li> <li>• Study of Operation Systems of windows</li> <li>• Study of Notepad / WordPad</li> </ul>
7.	<p>Civil Engineering :</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Scope</li> <li>• Branches of Civil Engineering</li> </ul>
8.	<p>Engineering Materials :</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Various types of materials &amp; their uses</li> </ul>
9.	<p>Building Construction :</p> <ul style="list-style-type: none"> <li>• Brick Masonry – meaning and types</li> <li>• Materials used in Brick Masonry</li> <li>• Stone Masonry – meaning and types</li> <li>• Materials used in Stone Masonry</li> </ul>
10.	<p>Timber :</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• C/S of Exogenous tree trunk</li> <li>• Various Indian timbers</li> </ul>
11.	<p>Units of measurement and payment :</p> <ul style="list-style-type: none"> <li>• Definition of unit</li> <li>• Types of unit</li> <li>• Conversion of units</li> <li>• Units of area and volume</li> </ul>
12.	<p>Menstruation :</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Plain figures</li> <li>• Areas of simple figures and polygon</li> <li>• Volumes of solids – cylinder, prism etc.</li> </ul>

13.	<p>Wall :</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Types of wall</li> <li>• Materials used in wall</li> </ul>
14.	<p>Building structural members :</p> <ul style="list-style-type: none"> <li>• Foundation</li> <li>• Plinth</li> <li>• Floor</li> <li>• Roof</li> <li>• Stair and staircases</li> <li>• Door and window</li> </ul>
15.	<p>Mortar :</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Materials used</li> <li>• Uses of mortar</li> <li>• Hand mixing of mortar</li> </ul>
16.	<p>Concrete :</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Materials used</li> <li>• Uses of concrete</li> <li>• Hand mixing of concrete</li> </ul>
17.	<p>Engineering Drawing :</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Importance</li> <li>• Types of lines</li> <li>• Instruments used</li> <li>• Materials used</li> </ul>
18.	<p>Orthographic projection :</p> <ul style="list-style-type: none"> <li>• Meaning</li> <li>• Four Quadrants – concept</li> <li>• I st angle method</li> <li>• III rd angle method</li> <li>• Recognition of views from simple objects</li> </ul>
19.	<p>Isometric projection :</p> <ul style="list-style-type: none"> <li>• Meaning</li> <li>• Recognition of object from given views</li> <li>• Construction of Isometric scale</li> </ul>
20.	<p>Lettering and Dimensioning :</p> <ul style="list-style-type: none"> <li>• Lettering – meaning</li> <li>• Types of lettering</li> <li>• Lettering practice</li> <li>• Dimensioning – meaning</li> <li>• Types of dimensioning</li> </ul>

21.	<p>Foundation :</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Objects of foundation</li> <li>• Types of foundation</li> </ul>
22.	<p>R.C.C. :</p> <ul style="list-style-type: none"> <li>• Definition</li> <li>• Materials used</li> <li>• Uses</li> </ul>
23.	<p>Carpentry :</p> <ul style="list-style-type: none"> <li>• Woodwork – meaning</li> <li>• Tools used in carpentry</li> <li>• Joints in carpentry</li> </ul>
24.	<p>Plumbing :</p> <ul style="list-style-type: none"> <li>• Meaning</li> <li>• Tools used in plumbing</li> <li>• Pipes used in plumbing</li> <li>• Sanitary fittings</li> </ul>
25.	<p>Electrical works :</p> <ul style="list-style-type: none"> <li>• Meaning and purpose</li> <li>• Electrical symbols</li> <li>• Types of wiring</li> </ul>
26.	<p>Brickwork :</p> <ul style="list-style-type: none"> <li>• English bond and its characteristics</li> <li>• Flemish bond and its characteristics</li> </ul>

**Practical Paper – I Basic Civil Engg. & Materials**

Sr. No.	Topic
1.	Sketching practice of Drawing Instruments
2.	Sketching practice of Drawing Instruments
3.	To construct Geometrical figures – squares, rectangles, circles, polygon etc.
4.	Field tests of bricks
5.	Field tests of cement
6.	Study of Ohm's Law
7.	Study of Kirchhoff's Law
8.	Study of Resistors
9.	Study of Capacitors
10.	Study of transformer
11.	To study Direct Current
12.	To Study Alternating Current
13.	To study principles of Electric Iron
14.	To study Principles of Geyser
15.	To study types of wirings
16.	Study of peripheral devices
17.	Study of display settings
18.	Notepad : <ul style="list-style-type: none"> <li>• Typing text</li> <li>• Editing text</li> <li>• Formatting text</li> <li>• Printing text</li> </ul>
1.	Market Survey of Engineering Materials
2.	Construction of Brick masonry without mortar <ul style="list-style-type: none"> <li>• Header bond</li> <li>• Stretcher bond</li> <li>• English bond</li> <li>• Flemish bond</li> </ul>
3.	Sketching practice – <ul style="list-style-type: none"> <li>• Header bond</li> <li>• Stretcher bond</li> <li>• English bond</li> <li>• Flemish bond</li> </ul>
4.	Conversion of various units
5.	Calculation of areas of simple figures
6.	Sketching practice of : <ul style="list-style-type: none"> <li>• parapet wall</li> <li>• compound wall</li> </ul>
7.	Simple sketches of : <ul style="list-style-type: none"> <li>• Foundation</li> <li>• Floor</li> <li>• Roof</li> <li>• Stair and staircases</li> </ul>
8.	Hand mixing of mortar
9.	Hand mixing of concrete
10.	Calculation of volumes of : <ul style="list-style-type: none"> <li>• Cylinder</li> <li>• Prism</li> <li>• Frustum of cone</li> </ul>

**Practical Paper – II**  
**Basic Engineering Drawing & Plumbing**

Sr. No.	Topic
1.	Sketching of Drawing instruments
2.	Sketching views in Its angle method of projection
3.	Sketching views in IIIrd angle method of projection
4.	Sketching object from given views
5.	Construction of isometric scale
6.	Sketching practice of drawing scales : <ul style="list-style-type: none"><li>• Plain scale</li><li>• Diagonal scale</li></ul>
7.	Lettering practice of different sizes and types
8.	Sketching of simple footing and R.C.C. footing
9.	To prepare joints in woodwork
10.	To prepare jobs in plumbing work – threading of pipes
11.	Construction of English bond with mortar
12.	Construction of Flemish bond with mortar

**Accommodation / Lab Requirements**

Sr. No.	Contents
01.	Classroom – 500 Sq. Feet and Open Ground for Practical
02.	Drawing Hall – 600 Sq. Feet with 30 Drawing Desks and stools
03.	Computer table – 600 Sq. Feet
04.	Electronics lab - 600 Sq. Feet
05.	Electrical lab - 600 Sq. Feet

### List of Reference Books

Sr. No.	Author	Book	Publications
01.	Sushil Kumar	Building Construction	
02.	Ahuja Birdi	Fundamentals of Building Construction	
03.	Rangwala	A Text Book of Building Construction	
04.	Chaudhari – Building Material		
05.	Vastu shilpa yojna va Abhikalpana (Marathi)	Maharashtra Vidyapith	Grantha Nirmal Mandal – Nagpur
06.	Surveying and Levelling (Vol I)	T. P. Kulkarni and S.V. Kulkarni	
07.	Parbat Singh	Engineering Materials	
08.	B.C.Punmia	Building Costruction	
09.	N.D.Bhatt and V.M. Panchal	Engineering Drawing	Charotar Publications, Anand
10.	R.S.Malik, G.S.Deo	Civil Engineering Drawing	
11.	W.B.mckay	Building Construction Volume – 1, 2, 3, 4	Orient Longman
12.	B.Shri Kapare	Concrete – Ek Tantra (Marathi)	
13.	Dhabale / Patwardhan	Bandhkamacha Onama (Marathi)	
14.	B.D.Erande	Bandhkam Andazpatrak shastra (Marathi)	
15.	Shah, Kale, Patki	Building Drawing	
16.	Hajra Choudhari	Elements of Workshop Technology Part I	

List of Tools and Equipments

Sr. NO.	Name	Qty.
01.	Sensative Balance with weights	1 Set
02.	Ventilated Oven	1
03.	Slump Cone	1
04.	90 micron sieve	1
05.	Sand sieves	1
06.	Needle Vibrator	1 each
07.	Screened Vibrator	1
08.	Vicat's Apparatus	1
09.	Drilling machine	1
10.	Tile cutting machine	1
11.	Mini mixer (1/2 cement bag)	1
12.	Over Head projector with screen	1
13.	Bar Bending table	1 Set
14.	Different size of Trays	1 Set
15.	Batching Box	2
16.	Metallic tape – 15m , 30 m	2 Each
17.	Scale – 1 m	1
18.	Trowels	10
19.	Steel Buckets	5
20.	Iron pans	5
21.	Rammer	1
22.	Linedori Bundles	2
23.	Plumb bob	5
24.	Spirit level	5
25.	Tube level	5
26.	Spade	2
27.	Measuring Cylinder	2
28.	Pickaxe	2
29.	L square	5
30.	Scabbling hammer	2
31.	One Computer with latest configuration	1
32.	Ohm's Meter	5
33.	Kirchhoff's Instrument	5
34.	Capacitors, Resistors	30
35.	Electric iron	1
36.	Casing caping wiring set	Lump sum
37.	Screw drivers	5
38.	Testing meters	5

\*\*\*\*\*