

MAHARASHTRA STATE BOARD OF VOCATIONAL EXAMINATIONS, MUMBAI 051.

1	Name of Syllabus	CC IN ELEMENTS OF HARDWARE ENGINEERING (301129)																																									
2	Max. No's of Student	25 students.																																									
3	Duration	6 Months																																									
4	Type	Part time																																									
5	No Of Days / Week	6 Days																																									
6	No Of Hours /Days	4 Hrs																																									
7	Space Required	Workshop = 300 Sq feet Class Room = 200 Sq feet TOTAL = 500 Sq feet																																									
8	Entry Qualification	7 th passed																																									
9	Objective Of Syllabus/ introduction	KNOWLEDGE OF HARDWARE ENGINEERING																																									
10	Employment Opportunity	To generate employment & self employment in computer hardware engg																																									
11	Teacher's Qualification	Diploma/Certificate in concern course																																									
12	Training System	Training System Per Week <table><tr><td colspan="2">Theory</td><td colspan="2">Practical</td><td colspan="3">Total</td></tr><tr><td colspan="2">06 Hours</td><td colspan="2">18 Hours</td><td colspan="3">24 Hours</td></tr></table>							Theory		Practical		Total			06 Hours		18 Hours		24 Hours																							
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13	Exam. System	<table><tr><td>Sr. No</td><td>Paper Code</td><td>Name of Subject</td><td>TH/PR</td><td>Hours</td><td>Max. Marks</td><td>Mini. Marks</td></tr><tr><td>1</td><td>30112911</td><td>Basic of Hardware Engineering</td><td>TH - I</td><td>3 hrs.</td><td>100</td><td>35</td></tr><tr><td>2</td><td>30112921</td><td>Basic of Hardware Engineering</td><td>PR - I</td><td>6 hrs.</td><td>200</td><td>100</td></tr><tr><td>3</td><td>30112922</td><td>Basic of Software Engineering</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>185</td></tr></table>							Sr. No	Paper Code	Name of Subject	TH/PR	Hours	Max. Marks	Mini. Marks	1	30112911	Basic of Hardware Engineering	TH - I	3 hrs.	100	35	2	30112921	Basic of Hardware Engineering	PR - I	6 hrs.	200	100	3	30112922	Basic of Software Engineering	PR - II	3 hrs.	100	50			Total			400	185
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THEORY - I - Basic of Hardware Engineering

Sr. No.	Topic
1.	Introduction to Computer systems and Overview of Operating Systems <ul style="list-style-type: none"> * Introduction to Computers, generations of computer * Classification of Computers based on Purpose, Operation & Size * Anatomy of Computers * Number Systems * Basic I/O Devices * Block Diagram of CPU * Memory units- Primary and Auxiliary memory * Operating Systems * Programming Languages, general software features and trends. * DOS and Working with DOS Commands * Configuring DOS and Batch files * Windows Operating System
2.	Semi Conductor Theory: Atomic structure, Semiconductor, P-type Semiconductor, N-type Semi conductor, Diode, Transistor, Diode circuits, Transistor circuits.
3.	Digital Electronics: Binary Number System, Binary Arithmetic, Logic Gates, Adders, Subtractors, Flip-Flops.
4.	Multiplexers, De Multiplexers, Counters, Memory: Types of Memories, Registers, RAM, ROM, PROM, EPROM.
5.	Power Supplies: Definition, Function, Types, Filters, Regulation, SMPS, UPS ...etc.
6	Introduction to Computer Networking <ul style="list-style-type: none"> • Introduction to Computer Networks • Client Server Model • Types of Networks
7.	Transmission Media <ul style="list-style-type: none"> * Introduction to transmission media, Characteristics of Transmission media, Cable media, Wireless media and the merits and demerits
8.	Network connectivity devices: <ul style="list-style-type: none"> * OSI Model in detail. Explanation of different layers with its functions. * Various Network connectivity devices: Gateways, Hub, Bridges, Switches, Routers, Repeaters, Multiplexers, Modem etc.
9.	TCP/IP Fundamentals <ul style="list-style-type: none"> * Introduction to TCP/IP (internet) protocol * Purpose of layers in TCP/IP Model * Network Classes * DHCP * DNS (Domain Name System) * IP Address and Subnet mask
10.	Data communications: Definition – Types of communication – Band width – Communication channels- modes of transmission – multiplexing
11.	Network topologies: Definition – Types of Networks (Private, LAN, WAN, MAN, Value Added) – Network topologies(Bus, Ring, Star, Mesh and Hybrid)

12.	<p>LAN Components :</p> <ul style="list-style-type: none"> * Work station * File Server * Gateways * NIC(Lan Cables, Lan Cards, Ethernet cards, etc) * Hubs/ Switches
13.	<p>Communication HardWare:</p> <p>Adopters - Multiplexers – Modems - V-SAT - ATMS</p>
14.	<p>Network Environment & Web Applications:</p> <p>UNIX</p> <p>WIN-NT</p> <p>Messaging - E-Mail – FTP - Gopher - Telnet – Web Browsers -</p> <p>Internet Explorer - Netscape Navigator - Mosaic</p>
15.	<p>Introduction to Computer systems and Hardware</p> <ul style="list-style-type: none"> * Introduction to Computers, generations of computer * Classification of Computers based on Purpose, Operation & Size * Anatomy of Computers, Number Systems * Basic I/O Devices, Block Diagram of CPU * Memory units- Primary and Auxiliary memory * Operating Systems, Programming Languages, general software features and trends. * Utilities
16.	<p>. Introduction to Problem Solving Techniques</p> <ul style="list-style-type: none"> * Procedure and Algorithms * Flowcharts, Pseudo code
17.	<p>Features of ‘C’</p> <ul style="list-style-type: none"> * Introduction to ‘C’ * Structure of a ‘C’ Program * Data types in ‘C’ – Constants & Variables- operators and Expressions * Statements – data definition- assignment- * I/O control structure (if, if-else, for, while, do-while) * Structure for looping and nested looping * Branching(switch, break, continue) * Unconditional branching(go to statement) <p>Simple programs covering above topics</p>
18.	<p>Functions</p> <ul style="list-style-type: none"> * What is a function * Difference between a function and a procedure * Advantages of functions * User defined, library functions, main function * Return types. * Concepts associated with functions Recursion, scope of a function, extent of a variable
19.	<p>Structured data processing in ‘C’</p> <ul style="list-style-type: none"> * Array as Data structure- defining single and multi dimensional arrays, simple operations on arrays, simple programs on arrays. * String as Data Structure: Defining Strings, Simple operations on Strings- String processing functions like strlen(), strcpy(), strcmp() .etc
20.	<p>Data structured as Records</p> <ul style="list-style-type: none"> * Structures and unions:- declaration – operation on structures, array of structures, array with structures, structure as data types

PRACTICAL – I - BASIC OF HARDWARE ENGINEERING

1.	Digital Electronics: Binary Number System, Binary Arithmetic, Logic Gates, Adders, Subtractors, Flip-Flops.
2.	Multiplexers, De Multiplexers, Counters, Memory: Types of Memories, Registers, RAM, ROM, PROM, EPROM.
3.	Introduction to Computer Networking <ul style="list-style-type: none"> • Introduction to Computer Networks • Client Server Model • Types of Networks
4.	Network connectivity devices: *OSI Model in detail. Explanation of different layers with its functions. * Various Network connectivity devices: Gateways, Hub, Bridges, Switches, Routers, Repeaters, Multiplexers, Modem etc.
5.	TCP/IP Fundamentals * Introduction to TCP/IP (internet) protocol * Purpose of layers in TCP/IP Model * Network Classes * DHCP * DNS (Domain Name System) * IP Address and Subnet mask
6.	Network topologies: Definition – Types of Networks (Private, LAN, WAN, MAN, Value Added) – Network topologies(Bus, Ring, Star, Mesh and Hybrid)
7.	LAN Components : * Work station * File Server * Gateways * NIC(Lan Cables, Lan Cards, Ethernet cards, etc) * Hubs/ Switches
8.	Communication HardWare: Adopters - Multiplexers – Modems - V-SAT - ATMS
9.	Network Environment & Web Applications: UNIX WIN-NT Messaging - E-Mail – FTP - Gopher - Telnet – Web Browsers - Internet Explorer - Netscape Navigator – Mosaic

PRACTICAL – II - BASIC OF SOFTWARE ENGINEERING

1.	<p>Introduction to Computer systems and Hardware</p> <ul style="list-style-type: none">* Introduction to Computers, generations of computer* Classification of Computers based on Purpose, Operation & Size* Anatomy of Computers, Number Systems* Basic I/O Devices, Block Diagram of CPU* Memory units- Primary and Auxiliary memory* Operating Systems, Programming Languages, general software features and trends.* Utilities
2.	<p>. Introduction to Problem Solving Techniques</p> <ul style="list-style-type: none">* Procedure and Algorithms* Flowcharts, Pseudo code
3.	<p>Features of 'C'</p> <ul style="list-style-type: none">* Introduction to 'C'* Structure of a 'C' Program* Data types in 'C' – Constants & Variables- operators and Expressions* Statements – data definition- assignment-* I/O control structure (if, if-else, for, while, do-while)* Structure for looping and nested looping* Branching(switch, break, continue)* Unconditional branching(go to statement)Simple programs covering above topics
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6.	<p>Data structured as Records</p> <ul style="list-style-type: none">* Structures and unions:- declaration – operation on structures, array of structures, array with structures, structure as data types
