G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution under UGC Act 1956 &Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur)

Department of Electronics Engineering

TEACHING PLAN

Qualification Pack Details:

Name of Sector	Sub-Sector	Qualification Pack (Course Name)	Link	Scheme	DURATION
TELECOM	Handset (Passive Infra Segment)	TEL/Q2303 - Telecom Embedded Hardware Developer	http://www.nsdcindia.org/telecom	Pradhan Mantri Kaushal Vikas Yojna (PMKVY)	**350 HOURS** [5-Months] (3-HOURS / 5-DAYS/ PER WEEK)
Applicable National Occupational Standards (NOS)	1. TEL/N 2311 (Embedded Hardware Development) 2. TEL/N 2312 (Embedded Firmware Development) 3. TEL/N 4121 (Maintain a Healthy, Safe and Secure Working Environment)				

SYLLABUS

Topic Nos.	**Syllabus Contents**	**No. of Hours**	**Resources Person**
TEL/N2311 Embedded Hardware Development			
1	Introduction of Embedded Hardware/Software development	3	SVB
2	Introduction of Embedded Hardware/Software development Tools & Platform	9	SSD
3	Technical specification of embedded products as per Controller usage	3	SSD
4	Designing, Implementing, Integrating and Testing software for Modern Embedded Systems using Different techniques	6	SSD
5	Perform basics task on Cross Compiler Based on Microcontroller such as Micro vision Keil/Arduino/Code Composer Studio CS V4	6	SNJ
6	Introduction of Micro Controller Hardware	3	SSD
7	Hands-on Basic Assembly Programming on micro controller.	6	SNJ
8	Hands-on Basic Assembly Programming on micro controller.	3	SNJ
9	Hands-on Embedded C Programming regarding Microcontroller	6	MMP
10	Hands-on Embedded C Programming regarding Microcontroller	3	MMP
	Class Room Test-I	3	SNJ
11	Design and Perform peripheral interfaces for I2C communication protocols and test with logic Analyzer.	6	MMP
12	Perform peripheral interfaces for SPI communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	SSD

13	Perform peripheral interfaces for UART /USART communication protocols with AT89c51/Arduino Controller and test with CRO/logic Analyzer.	6	SNJ
14	Perform peripheral interfaces for Infrared communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	MMP
15	Perform peripheral interfaces for RF communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	MMP
16	Perform peripheral interfaces for GSM communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	MMP
17	Perform peripheral interfaces for GPS communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	MMP
18	Design and Perform peripheral interfaces for PDH/SDH/Ethernet communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	SNJ
19	Design and Perform peripheral interfaces for QSPI communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	SVB
20	Perform peripheral interfaces for Zigbee communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	SVB
21	Perform peripheral interfaces for Wi-Fi communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	SVB
22	Perform peripheral interfaces for Bluetooth communication protocols with AT89c51/Arduino Controller and test with logic Analyzer.	6	SVB
23	Perform ADC Interfacing in real time data acquisition and test signal on CRO.	6	SNJ
24	Perform Signal Patterns generation with DAC in real time with controller	3	SNJ
25	Perform peripheral sensors interfacing such as temperature, Ultrasonic, Piezo-electrics, Ph-sensor with AT89c51/Arduino Controller and test with logic Analyzer.	9	SVB
	Class Room Test-II	3	SVB
26	Study of different components for the hardware design including micro-controllers	3	SNJ
27	Introduction to PCB Simulation Tools as ORCAD, Fridzing	12	SNJ
28	Hands-on PCB Design for digital and analog circuits using simulation tools	3	MMP
29	Hands-on different PCB Schematics and layout for simple circuits.	3	MMP
30	Testing of different PCB Schematics and layout for Complex circuits.	6	MMP
31	Design and Develop Embedded system based small, intelligent communication and networking gadgets and application	6	SVB
32	System installation and Resolving Problem for Embedded System	6	SVB
33	Perform circuit testing, integration and debugging to support and maintain embedded products	9	SVB
34	Circuit testing, Integration and debugging	9	SVB
	Class Room Test-III	3	MMP
35	**Preparation of Progress report, record Sheets**	3	SNJ
36	**Technical Email Writing and Communication with Clients**	3	SNJ
TEL/N2312 - Embedded Firmware Development			
37	Introduction of Embedded Firmware development	3	SNJ

38	Introduction of procedures, tools, and techniques for Embedded Firmware development	3	MMP
39	Hands-on Embedded Hardware/Software development Tools & Platform	6	SSD
40	Develop firmware using embedded C and C++ programming languages	15	SSD
41	Interaction of core frameworks in Eclipse Platform for Application development.	9	SSD
	Class Room Test-IV	3	MMP
42	Perform Programming tools like gcc, gdb, eclipse and integrated design environments for HW-SW co-design Embedded Firmware	15	Industry Person
43	Develop and test code firmware for micro-controllers & other programmable devices	6	Industry Person
44	Hand-on memory efficient and computationally optimal code for telecom products	6	Industry Person
45	Design & develop wireless connectivity stacks/firmware for communication protocols including, but not limited to Zigbee, Bluetooth, TCP/IP, SPI, I2C, USB, RS232, RS485 for Hand Held Devices.	12	Industry Person
46	handle the firmware for maintenance and troubleshooting of telecom equipment based on Eclips Platform for Hand Held Devices.	3	Industry Person
47	Test and verify firmware design and prototyping	6	Industry Person
48	Perform Interfacing firmware of network systems based on communication protocols interfaces like I2C, SPI, UART, Infrared, RF, GSM, GPS, PDH/SDH/Ethernet, QSPI, Zigbee, Wi-Fi and Bluetooth for Hand Held Devices.	15	Industry Person
49	Design ,develop and test Small Application Support to telecom Product.	12	MMP
	Class Room Test-V	3	SNJ
TEL/N2313 - Maintain a healthy, safe and secure working environment [Field Work]			
50	Introduction of health and safety risk as per company's guidelines prior to commencement of work.	3	SNJ
51	Introduction of ensure environmental conditions and hazards like Earth Potential Rise (EPR)	3	SNJ
52	Perform case study to identify and correct any hazards that you can deal with safely, competently and within the limits of your authority	6	SSD
53	Perform case study to identify and recommend opportunities for improving health, safety, and security to the designated person.	6	Industry Person
54	**Preparation of Progress report on environmental safety conditions and hazards as per industry requirement.**	3	Industry Person
	Class Room Test-VI	3	SVB
	Final Assessment Examination		

Prof.M.M.Pathan
Prof.S.N.Joshi
Prof.S.V.Bhalero
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