SYLLABUS FOR ELECTRONICS MECHANIC TRADE			
SECOND YEAR			
Duration	**Reference Learning Outcome**	**Professional Skills (Trade Practical) With Indicative Hours**	**Professional Knowledge (Trade Theory)**
Professional Skill 25 Hrs; Professional Knowledge 06 Hrs	Prepare, crimp, terminate and test various cables used in different electronics industries. (Mapped NOS: ELE/N6307)	**Electronic Cables & Connectors** 135. Identify various types of cables viz. RF coaxial feeder, screened cable, ribbon cable, RCA connector cable, digital optical audio, video cable, RJ45, RJ11, Ethernet cable, fibre optic cable splicing, fibre optic cable mechanical splices, insulation, gauge, current capacity, flexibility etc. used in various electronics products, different input output sockets. (05 Hrs.) 136. Identify suitable connectors, solder/crimp /terminate & test the cable sets. (05 Hrs.) 137. Check the continuity as per the marking on the connector for preparing the cable set. (05 Hrs.) 138. Identify and select various connectors and cables inside the CPU cabinet of PC. (05 Hrs.) 139. Identify the suitable connector and cable to connect a computer with a network switch and prepare a cross over cable	Cable signal diagram conventions Classification of electronic cables as per the application w.r.t. insulation, gauge, current capacity, flexibility etc. Different types of connector & their terminations to the cables. Male / Female type DB connectors. Ethernet 10 Base cross over cables and pin out assignments, UTP and STP, SCTP, TPC, coaxial, types of fibre optical Cables and Cable trays. Different types of connectors Servo 0.1” connectors, FTP, RCA,BNC,HDMI Audio/video connectors like XLR, RCA (phono), 6.3 mm PHONO, 3.5 / 2.5 mm PHONO, BANTAM, SPEAKON, DIN, mini DIN, RF connectors, USB, Fire wire, SATA Connectors, VGA, DVI connectors, MIDI and RJ45,RJ11 etc. (06 Hrs.)

		to connect two network computers. (05 Hrs.)	
Professional Skill 80 Hrs; Professional Knowledge 34 Hrs	Install, configure, interconnect given computer system(s) and demonstrate & utilize application packages for different application. (Mapped NOS: ELE/N4614)	**Computer Hardware, OS, MS office and Networking** 140. Demonstrate various parts of the system unit and motherboard components. (06 Hrs.) 141. Identify various computer peripherals and connect it to the system. (04Hrs.) 142. Disable certain functionality by disconnecting the concerned cables SATA/ PATA. (05 Hrs.) 143. Replace the CMOS battery and extend a memory module. (06 Hrs.) 144. Test and Replace the SMPS. (05 Hrs.) 145. Replace the given DVD and HDD on the system. (06 Hrs.) 146. Dismantle and assemble the desktop computer system. (07 Hrs.) 147. Boot the system from Different options. (07 Hrs.) 148. Install OS in a desktop computer. (05 Hrs.) 149. Install a Printer driver software and test for print outs. (05 Hrs.) 150. Install antivirus software, scan the system and explore the options in the antivirus software. (05 Hrs.)	Basic blocks of a computer, Components of desktop and motherboard. Hardware and software, I/O devices, and their working. Different types of printers, HDD, DVD. Various ports in the computer. Windows OS MS widows: Starting windows and its operation, file management using explorer, Display & sound properties, screen savers, font management, installation of program, setting and using of control panel, application of accessories, various IT tools and applications. Concept of Internet, Browsers, Websites, search engines, email, chatting and messenger service. Downloading the Data and program files etc. **Computer Networking:-** Network features - Network medias Network topologies, protocols- TCP/IP, UDP, FTP, models and types. Specification and standards, types of cables, UTP, STP, Coaxial cables. Network components like hub, Ethernet switch, router, NIC Cards, connectors, media and firewall. Difference between PC &Server.

		151. Install MS office software. (05 Hrs.) 152. Browse search engines, create email accounts, practice sending and receiving of mails and configuration of email clients. (08 Hrs.) 153. Prepare terminations, make UTP and STP cable connectors and test. (08 Hrs.) 154. Configure a wireless Wi-Fi network. (10 Hrs.)	(34 Hrs.)
Professional Skill 70 Hrs; Professional Knowledge 20 Hrs	Identify, place, solder and desolder and test different SMD discrete components and ICs package with due care and following safety norms using proper tools/setup. (Mapped NOS: ELE/N5102)	**Basic SMD (2, 3, 4 terminal components)** 155. Identification of 2, 3, 4 terminal SMD components. (05 Hrs.) 156. De-solder the SMD components from the given PCB. (05 Hrs.) 157. Solder the SMD components in the same PCB. (05 Hrs.) 158. Check for cold continuity of PCB. (05 Hrs.) 159. Identification of loose /dry solder, broken tracks on printed wired assemblies. (05 Hrs.)	Introduction to SMD technology Identification of 2, 3, 4 terminal SMD components. Advantages of SMD components over conventional lead components. Soldering of SM assemblies - Reflow soldering. Tips for selection of hardware, Inspection of SM. (05 Hrs.)
		SMD Soldering and De-soldering 160. Identify various connections and setup required for SMD Soldering station. (05 Hrs.) 161. Identify crimping tools for various IC packages. (05 Hrs.)	Introduction to Surface Mount Technology (SMT). Advantages, Surface Mount components and packages. Introduction to solder paste (flux). Soldering of SM assemblies, reflow soldering.

		162. Make the necessary settings on SMD soldering station to de-solder various ICs of different packages (at least four) by choosing proper crimping tools. (07 Hrs.) 163. Make the necessary settings on SMD soldering station to solder various ICs of different packages (at least four) by choosing proper crimping tools. (8 Hrs.) 164. Make the necessary setting rework of defective surface mount component used soldering / de-soldering method. (8 Hrs.)	Tips for selection of hardware, Inspection of SM. Identification of Programmable Gate array (PGA) packages. Specification of various tracks, calculation of track width for different current ratings. Cold/ Continuity check of PCBs. Identification of lose / dry solders, broken tracks on printed wiring assemblies. Introduction to Pick place Machine, Reflow Oven, Preparing stencil,& stencil printer (15 Hrs.)
Professional Skill 20 Hrs; Professional Knowledge 10 Hrs	Rework on PCB after identifying defects from SMD soldering and de-soldering. (Mapped NOS:ELE/N5102)	**PCB Rework** 165. Checked and Repair Printed Circuit Boards single, Double layer and important tests for PCBs. (10 Hrs.) 166. Inspect soldered joints, detect the defects and test the PCB for rework. (10Hrs.)	Introduction to Static charges, prevention, handling of static sensitive devices, various standards for ESD. Introduction to non-soldering interconnections. Construction of Printed Circuit Boards (single, Double, multi-layer), Important tests for PCBs. Introduction to rework and repair concepts. Repair of damaged track. Repair of damaged pad and plated through hole. Repair of solder mask. (10 Hrs.)
Professional Skill 30 Hrs;	Construct different electrical control	**Protection devices** 167. Identify different types of	Necessity of fuse, fuse ratings,

Professional Knowledge 10 Hrs	circuits and test for their proper functioning with due care and safety. ELE/N9406	fuses along with fuse holders, overload (no volt coil), current adjust (Biometric strips to set the current). (06 Hrs.) 168. Test the given MCBs. (03 Hrs.) 169. Connect an ELCB and test the leakage of an electrical motor control circuit. (05 Hrs.)	types of fuses, fuse bases. Single/ three phase MCBs, single phase ELCBs. Types of contactors, relays and working voltages. Contact currents, protection to contactors and high current applications. (05 Hrs.)
		170. Test DC motor and its operating voltage. (03 Hrs.) 171. Test DC motor control signal. (03 Hrs.) 172. Test various Low potential motors. (03 Hrs.) **Stepper Motor** 173. Test stepper motor. (03 Hrs.) 174. Demonstrate working process of stepper motor in various Equipment. (04 Hrs.)	1.LOW VOLTAGE DC MOTOR (Low Potential motor) Introduction of DC motor. Types of DC motor .Types of DC motor controller. DC Motor power. Types of DC Motor power regulation. Application area of DC motor controller. 2.What is a Stepper motor and its types. Stepper Motor working Principal. How to select a stepper motor Types of wiring of stepper motor. Stepper motor control By varying clock pulses. Advantage of stepper motor. (05 Hrs.)
Professional Skill 60 Hrs; Professional Knowledge 15 Hrs	Assemble and test a commercial AM/ FM receiver and evaluate performance. ELE/N9407	**Communication electronics** 175. Modulate and Demodulate various signals using AM and FM on the trainer kit and observe waveforms. (08 Hrs.) 176. Test IC based AM Receiver (08 Hrs.)	Radio Wave Propagation – principle, fading. Need for Modulation, types of modulation and demodulation. Fundamentals of Antenna, various parameters, types of Antennas & application. Introduction to AM, FM & PM,

		177. Test IC based FM transmitter. (06 Hrs.) 178. Test IC based AM transmitter and test the transmitter power. Calculate the modulation index. (08 Hrs.) 179. Dismantle the given FM receiver set and identify different stages (AM section, audio amplifier section etc). (10 Hrs.) 180. Modulate two signals using AM kit draw the way from and calculate percent (%) of modulation. (10 Hrs.) 181. Modulate and Demodulate a signal using PAM, PPM, PWM Techniques. (10 Hrs.)	SSB-SC & DSB-SC. Block diagram of AM and FM transmitter. FM Generation & Detection. Digital modulation and demodulation techniques, sampling, quantization & encoding. Concept of multiplexing and de multiplexing of AM/ FM/ PAM/ PPM /PWM signals. ***A simple block diagram approach to be adopted for explaining the above mod/demod techniques.*** (15 Hrs.)
Professional Skill 60 Hrs; Professional Knowledge 15 Hrs	Test, service and troubleshoot the various components of different domestic/ industrial programmable systems. ELE/N9407	**Microcontroller (8051)** 182. Identify various ICs & their functions on the given Microcontroller Kit. (07 Hrs.) 183. Identify the address range of RAM & ROM. (07 Hrs.) 184. Measure the crystal frequency, connect it to the controller. (07 Hrs.) 185. Identify the port pins of the controller & configure the ports for Input & Output operation. (07 Hrs.) 186. Use 8051 microcontroller, connect 8 LED to the port, blink the LED with a switch. (08 Hrs.)	Introduction Microprocessor & 8051Microcontroller, architecture, pin details & the bus system. Function of different ICs used in the Microcontroller Kit. Differentiate microcontroller with microprocessor. Interfacing of memory to the microcontroller. Internal hardware resources of microcontroller. I/O port pin configuration. Different variants of 8051 & their resources. Register banks & their functioning. SFRs & their configuration for different

		187. Perform the initialization, load & turn on a LED with delay using Timer. (08 Hrs.) 188. Perform the use of a Timer as an Event counter to count external events. (08 Hrs.) 189. Demonstrate entering of simple programs, execute & monitor the results. (08 Hrs.)	applications. Comparative study of 8051 with 8052. Introduction to PIC Architecture. (15 Hrs.)
Professional Skill 60 Hrs; Professional Knowledge 15 Hrs	Execute the operation of different sensors, identify, wire & test various transducers of IOT Applications ELE/N9408	**Sensors, Transducers used in IOT Applications** 190. Identify sensors used in process industries such as RTDs, Temperature ICs, Thermocouples, proximity switches (inductive, capacitive and photo electric), load cells, strain gauge. LVDT PT 100 (platinum resistance sensor), water level sensor, thermostat float switch, float valve by their appearance. (15 Hrs.) 191. Measure temperature of a lit fire using a Thermocouple and record the readings referring to data chart. (10 Hrs.) 192. Measure temperature of a lit fire using RTD and record the readings referring to data. (10 Hrs.) 193. Measure the DC voltage of a LVDT. (10 Hrs.) 194. Detect different objectives using	Basics of passive and active transducers. Role, selection and characteristics. Sensor voltage and current formats. Thermistors/ Thermocouples - Basic principle, salient features, operating range, composition, advantages and disadvantages. Strain gauges/ Load cell – principle, gauge factor, types of strain gauges. Inductive/ capacitive transducers - Principle of operation, advantages and disadvantages. Principle of operation of LVDT, advantages and disadvantages. Proximity sensors – applications, working principles of eddy current, capacitive and inductive proximity sensors. (15 Hrs.)

		capacitive, inductive and photoelectric proximity sensors. (15 Hrs.)	
Professional Skill 20 Hrs.; Professional Knowledge 06 Hrs.	Identify different IoT Applications with IoT architecture. ELE/N9409	195. Connect and test microcontroller to computer and execute sample programs (04hrs.) 196. Upload computer code to the physical board (Microcontroller) to blink a simple LED. (02hrs.) 197. Write and upload computer code to the physical Micro controller to sound buzzer. (02hrs.) 198. Circuit and program to Interface light sensor – LDR with Microcontroller to switch ON/OFF LED based on light intensity. (03hrs.) 199. Set up & test circuit to interface potentiometer with Microcontroller and map to digital values for e.g. 0-1023. (03hrs.)	Introduction to Internet of Things applications environment, smart street light and smart water & waste management. What is an IOT? What makes embedded system an IOT? Role and scope of IOT in present and future marketplace. Smart objects, Wired – Cables, hubs etc. Wireless – RFID, WiFi, Bluetooth etc. Different functional building blocks of IOT architecture. (06 hrs.)
Professional Skill 90 Hrs; Professional Knowledge 18 Hrs	Plan and carry out the selection of a project, assemble the project and evaluate performance for a domestic/commercial applications. (Mapped NOS: ELE/N9802)	**Analog IC Applications** Make simple projects/ Applications using ICs 741, 723, 555, 7106, 7107 Sample projects: • Laptop protector • Mobile cell phone charger • Battery monitor • Metal detector • Mains detector • Lead acid battery charger • Smoke detector • Solar charger	Discussion on the identified projects with respect to data of the concerned ICs. Components used in the project. (09 Hrs.)

		• Emergency light • Water level controller • Door watcher **(Instructor will pick up any five of the projects for implementation)** (45 Hrs.)	
		Digital IC Applications Make simple projects/Applications using various digital ICs (digital display, event counter, stepper motor driver etc) • Duty cycle selector • Frequency Multiplier • Digital Mains Resumption Alarm • Digital Lucky Random number generator • Dancing LEDs • Count down timer • Clap switch • Stepper motor control • Digital clock • Event counter • Remote jammer **(Instructor will pick up any five of the projects for implementation)** (45 Hrs.)	Discussion on the identified projects with respect to data of the concerned ICs. Components used in the project. (09 Hrs.)
Professional Skill 15 Hrs; Professional Knowledge 05 Hrs	Prepare fibre optic setup and execute transmission and reception. ELE/N9409	**Fiber optic communication** 200. Identify the resources and their need on the given fiber optic trainer kit. (02 Hrs.) 201. Make optical fiber setup to transmit and receive analog and digital data. (02 Hrs.) 202. Set up the OFC trainer kit	Introduction to optical fiber, optical connection and various types optical amplifier,its advantages, properties of optic fiber, testing, losses, types of fiber optic cables and specifications. Encoding of light. Fiber optic joints, splicing,

		to study AM, FM, PWM modulation and demodulation. (02 Hrs.) 203. Perform FM modulation and demodulation using OFC trainer kit using audio signal and voice link. (03 Hrs.) 204. Perform PWM modulation and demodulation using OFC trainer kit using audio signal and voice link. (03 Hrs.) 205. Perform PPM modulation and demodulation using OFC trainer kit using audio signal and voice link. (03 Hrs.)	testing and the related equipment/ measuring tools. Precautions and safety aspects while handling optical cables. (05 Hrs.)
Professional Skill 35 Hrs; Professional Knowledge 05 Hrs	Plan and Interface the LCD, LED DPM panels to various circuits and evaluate performance. ELE/N3102	**Digital panel Meter** 206. Identify LED Display module and its decoder/driver ICs. (05 Hrs.) 207. Display a word on a two line LED. (06 Hrs.) 208. Measure/current flowing through a resistor and display it on LED Module. (06 Hrs.) 209. Measure/current flowing through a sensor and display it on a LED module (DPM). (06 Hrs.) 210. Identify LCD Display module and its decoder/driver ICs. (06 Hrs.) 211. Measure/current flowing through a resistor and display it. (06 Hrs.)	Different types of seven segment displays, decoders and driver ICs. Concept of multiplexing and its advantages. Block diagrams of 7106 and 7107 and their configuration for different measurements. Use of DPM with seven segment display. Principles of working of LCD. Different sizes of LCDs. Decoder/ driver ICs used with LCDs and their pin diagrams. Use of DPM with LCD to display different voltage & current signals. (05 Hrs.)

Professional Skill 120 Hrs; Professional Knowledge 40 Hrs	Detect the faults and troubleshoot SMPS, UPS and inverter. (Mapped NOS: ELE/N7202)	**SMPS and Inverter** 212. Identify the components/devices and draw their corresponding symbols. (03 Hrs.) 213. Dismantle the given stabilizer and find major sections/ ICs components. (06 Hrs.) 214. List the defect and symptom in the faulty SMPS. (05 Hrs.) 215. Measure / Monitor major test points of computer SMPS. (07 Hrs.) 216. Troubleshoot the fault in the given SMPS unit. Rectify the defect and verify the output with load. Record your procedure followed for trouble shooting the defects. (08 Hrs.) 217. Use SMPS used in TVs and PCs for Practice. (05 Hrs.) 218. Install and test the SMPS in PC. (05 Hrs.) 219. Install and test an inverter. (05 Hrs.) 220. Troubleshoot the fault in the given inverter unit. Rectify the defects and verify the output with load. (08 Hrs.) 221. Construct and test IC Based DC-DC converter for different voltages. (08 Hrs.) 222. Construct and test a switching step down	Concept and block diagram of manual, automatic and servo voltage stabilizer, o/p voltage adjustment. Voltage cut-off systems, relays used in stabilizer. Block Diagram of different types of Switch mode power supplies and their working principles. Inverter; principle of operation, block diagram, power rating, change over period. Installation of inverters, protection circuits used in inverters. Battery level, overload, over charging etc. Various faults and its rectification in inverter. Block diagram of DC-DC converters and their working principals. (20 Hrs.)

		regulator using LM2576. (08 Hrs.) 223. Construct and test a switching step up regulator using MC 34063. (08 Hrs.)	
		UPS 224. Connect battery stack to the UPS. (07 Hrs.) 225. Identify front panel control & indicators of UPS. (05 Hrs.) 226. Connect Battery & load to UPS & test on battery mode. (06 Hrs.) 227. Open top cover of a UPS; identify its isolator transformers, the UPS transformer and various circuit boards in UPS. (08 Hrs.) 228. Identify the various test point and verify the voltages on these. (05 Hrs.) 229. Identify various circuit boards in UPS and monitor voltages at various test points. (05 Hrs.) 230. Perform load test to measure backup time. (08 Hrs.)	Concept of Uninterrupted power supply. Difference between Inverters and UPS. Basic block diagram of UPS & operating principle. Types of UPS : Off line UPS, On line UPS, Line interactive UPS & their comparison UPS specifications. Load power factor & types of indications & protections Installation of single phase & UPS. (20 Hrs.)
Professional Skill 60 Hrs; Professional Knowledge 15 Hrs	Identify, Test and verify characteristics of Photovoltaic cells, Modules, Batteries and Charge controllers. Install a	1. Identify and Test an LED and a Photodiode to verify the photo emitting effect and light sensitivity. (04 hrs) 2. Test a Photo voltaic cell for different illumination levels and verify photovoltaic	Semiconductor properties and types. P-type and N-type semiconductors, PN junction, etc. Conversion of solar radiation to electricity.

	solar panel, execute testing and evaluate performance by connecting the panel to the inverter. (Mapped NOS: ELE/N5902)	property. (04 hrs) 3. Plot I-V curve for photovoltaic cell based on the illumination at constant temperature. (04hrs) 4. Plot I-V curve for photovoltaic cell based on temperature at constant illumination. (04 hrs) 5. Test photovoltaic cell in sunlight at various angles of inclination and direction. (04 hrs)	Main materials used to develop solar cells (Silicon, Cadmium tellurides, etc.) Light sensitive properties of PN junction. Difference of photo electric and photo voltaic effects of a PN junction. PV cell characteristics, I–V curve, effects of temperature. Photovoltaic effect. Photo voltaic module: minimal functional specification, cells per module, max watts per module, maximum voltage at max power, maximum current at max power. (05)
		Solar Power (Renewable Energy System) 231. Wire a solar controller to a battery storage station. (08 Hrs.) 232. Connect storage batteries to a power inverter. (08Hrs.) 233. Connect and test solar panel to the Inverter and run the load. (08Hrs.) 234. Install a solar power to charge a rechargeable 12 V DC battery and find out the charging time. (08 Hrs.) 235. Install a Solar Inverter. (08 Hrs.)	Need for renewable energy sources, Solar energy as a renewable resource. Materials used for solar cells. Principles of conversion of solar light into electricity. Basics of photovoltaic's cell. Module, panel and Arrays. Factors that influence the output of a PV module. SPV systems and the key benefits. Difference between SPV and conventional power. Solar charge controller or regulator and its role. Safety precautions while working with solar systems. (10 Hrs.)

Professional Skill 30 Hrs; Professional Knowledge 10 Hrs	Dismantle, identify the various parts and interface of a cell phone to a PC. Estimate and troubleshoot. (Mapped NOS: ELE/N8107)	**Cell phones** 236. Dismantle, identify the parts and assemble different types of smart phones. (04 Hrs.) 237. Dismantle the cell phone/smart phone remove the key pad and clean it, test for the continuity of the matrix/tracks. (04 Hrs.) 238. Interface the cell phone/smart phone to the PC and transfer the data card. (03 Hrs.) 239. Flash the various brands of cell phone/smart phone (at least 3). (03 Hrs.) 240. Format the cell phone/ smart phone for virus (approach the mobile repair shop/ service centre). (04 Hrs.) 241. Perform the interfacing of cell phone/smart phone to the PC and dismantle the cell phone and identify the power section and test its healthiness. (04 Hrs.) 242. Find out the fault of basic cell phone system. Rectify the fault in ringer section and check the performance. (04 Hrs.) 243. Replace various faulty parts like mic, speaker, data/ charging/ audio jack etc. (04 Hrs.)	Introduction to mobile communication. Concept cell site, hand off, frequency reuse, block diagram and working of cell phones, cell phone features. GSM and CDMA technology. Use IEMI number to trace lost/misplaced mobile phone. (10 Hrs.)
Professional	Check the various	**LED Lights**	

Skill 15 Hrs; Professional Knowledge 05 Hrs	parts of a LED lights & stacks and troubleshoot. (Mapped NOS: ELE/N9302)	244. Dismantle the LED light, identify the connections of LEDs stacks, protection circuits, regulator. (03 Hrs.) 245. Identify the rectifier, controller part of LED lights. (03 Hrs.) 246. Make series string connection of six LED's and connect four Series strings in parallel. (03 Hrs.) 247. Connect to such parallel sets in Series to create a matrix of LED's. (03 Hrs.) 248. Apply suitable voltage and check Voltage across series strings. (03 Hrs.)	Types of LED panels used in various lighting applications. Stacking of LEDs. Driving of LED stacks. (05 Hrs.)
Professional Skill 50 Hrs; Professional Knowledge 15 Hrs	Identify, operate various controls, troubleshoot and replace modules of the LCD/LED TV & its remote. (Mapped NOS: ELE/N3102)	**LCD and LED TV** 249. Identify and operate different Controls on LCD, LED TV. (05 Hrs.) 250. Identify components and different sectors of LCD and LED TV. (05 Hrs.) 251. Dismantle; Identify the parts of the remote control. (05 Hrs.) 252. Dismantle the given LCD/LED TV to find faults with input stages through connectors. (05 Hrs.) 253. Detect the defect in a LED/LCD TV receiver given to you. Rectify the fault. (10 Hrs.) 254. Troubleshoot the faults in the given LED/LCD TV receiver. Locate and	Difference between a conventional CTV with LCD & LED TVs. Principle of LCD and LED TV and function of its different section. Basic principle and working of 3D TV. IPS panels and their features. Different types of interfaces like HDMI, USB, RGB etc. TV Remote Control –Types, parts and functions, IR Code transmitter and IR Code Receiver. Working principle, operation of remote control. Different adjustments, general faults in Remote Control. (15 Hrs.)

		rectify the faults. (10 Hrs.) 255. Test LED/LCD TV after troubleshooting the defects. (05 Hrs.) 256. Identify various connectors and connect the cable operators external decoder (set top box) to the TV. (05 Hrs.)	
ENGINEERING DRAWING: 40 Hrs.			
Professional Knowledge ED 40 Hrs	Read and apply engineering drawing for different application in the field of work. CSC/N9401	**ENGINEERING DRAWING:** • Reading of Electronics Sign and Symbols. • Sketches of Electronics components. • Reading of Electronics wiring diagram and Layout diagram. • Drawing of Electronicscircuitdiagram. DrawingofBlockdiagramofInstruments&equipmentoftrades.	
WORKSHOP CALCULATION & SCIENCE: 16 Hrs			
Professional Knowledge WCS 16 Hrs	Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. CSC/N9402	**WORKSHOP CALCULATION & SCIENCE:** **Algebra,** Addition, Subtraction,Multiplication&Divisions. Algebra– Theoryofindices, Algebraicformula,relatedproblems. **EstimationandCosting** Simpleestimationoftherequirementofmaterialetc.,asapplicabletothe trade. Problemsonestimationand costing.	
Project work / Industrial visit **Broad areas:** a) Remote control for home appliances b) Solar power inverter c) Musical light chaser d) 7 segment LED display decoder drive circuit			