

Department	Electronics Technology	Major	Industrial Electronics & Control						
Course Title	WS2: Basic Electronics	Code	145 ELC						
Prerequisites	144 ELC								
Course Description: In this second workshop course trainees gain skills in Electronic circuit testing, – Troubleshooting on simple electronic circuits – PCB design and assembling, solder and disconnect components from boards.		Trimester	1	2	3	4	5	6	
		Credit Hours (Hour/week)			2				
		Contact Hours (Hour/week)	L			0			
			W			4			
T									
General Goal: This course aims to give trained skills implement circuits on PCB board using different Techniques and dealing with electronic circuit diagram and execute the circuit.									
Detailed goals of the course		Related duty from the electronic technetium standards	Desired performance Specification						
First: execution goals The trainees should be able to:		- produces a manual and a computer supported electronic circuit layout - Etch the designed PCBs and arrange and assemble the circuit components - Diagnose components before mounting - Solder all components on PCB - Ensure of soldering points - Carry out a service diagnosis with the help of circuit diagrams - Analyse causes of faults, resulting	G2						
1. Understand electronic diagrams and manuals			G3						
2. Master the PCB board design			G4						
3. Master the assembling of components on PCB			G5						
4. Show awareness of electronic devices and testing to ensure that circuits work properly.			A1						
		A2							
		A3							
		A4							
		A6							
		E3							
		E4							
		E5							

	faults and performs trouble shooting	
Second: Assistance goals (Behavioral and Knowledge based) The trainees should be able to:		
Detailed goals of the course	Related duty from the electronic technetium standards	Desired performance Specification
1. Understand electronic diagrams and manuals 2. Select appropriate instruments for measurement	Distinguish the specification of used devices - Diagnose component before mounting - Select appropriate tools for soldering	Basic Knowledge C2
Safety Conditions		
<ul style="list-style-type: none"> • Wear proper clothes • Put the desired equipment away in an immovable and safe manner. • Connect the desired equipment properly and correctly. <ul style="list-style-type: none"> • Know the danger of electrical shocks • Understand safety rules and carefully deal with chemicals and ultraviolet light. 		
Theoretical & practical Topics	Related tasks and duty	
1. distinguish between electronic devices and their testing 2. Applications on voltage stabilizer 3. PCB Layout techniques 4. Components assembling of a voltage stabilizer on PCB 5. Application of optoelectronics devices	C4 G2 G3 G4 A2 A3 A4 E3 E4	- produces a manual and a computer supported electronic circuit layout - Etch the designed PCBs and arrange and assemble the circuit components - Diagnose component before mounting - Solder all components on PCB - Ensure of soldering points - Carry out a service diagnosis with the help of circuit diagrams - Select appropriate instruments for measurement - Analyse causes of faults, resulting faults and perform trouble shooting

Detailed Curriculum (Practice)		
Hrs	Contents	Evaluation Tools

2	1- Safety organization in workshops - Safety directives in workshops - Effects of current, voltage and frequency on the human body - What are the consequences? - human body resistance - Active parts contact protection - path of the electrical current through the body - Electrical shock protection - First aids. - Safety rules and discipline	1. Follow experiment performances 2. Reports 3. Simulations
16	2- Voltage stabilization circuits - Full wave rectifier circuit - Voltage regulator circuit - Types of circuits for elf regulation voltage - Components characteristics - Board implementation and testing - Board operation and measurement - Comparison of results	
8	3- PCB Layout techniques - Rules and safety regulations - Track runs on PCBs - Manual and computerized technique - Mounting plan of components - Etching technique	
12	4- Components assembling of a voltage stabilizer on PCB - Measuring instruments and methods - Functioning test - Troubleshooting	
14	5- Timers and counters circuit applications - Timer circuits using logic gates (simple pulse generator) - Timer circuits with Monostable: 555 IC - Timer circuits with Astable: 555 IC - Application using optical electronics components	
References	How to Design and Make Your Own PCB's ~R.A. Penfold Bernard Babani (Publishing) Ltd ork How Electronic Things W ~Robert Goodman Tab Books Paperback - July 1998 Circuits 305 ~Leonard Seymour (Editor) Elektor Electronics Paperback - 25 August, 1994	

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