

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	INDUSTRIAL ELECTRONICS								
<b>Job Area</b>	ELECTRONIC EQUIPMENT INSTALLATION ,TROUBLESHOOTING & MAINTENANCE								
<b>Competency Unit Title</b>	ELECTRONIC PRODUCT QUALITY CONTROL								
<b>Competency Unit Descriptor</b>	Electronic Product Quality Control is to carry out product quality control according to manufacturer's manual and specification. The personnel who are competent in electronic product quality control shall be able to identify product specification, carry out product specification functionality, interpret the inspection result and prepare inspection results report.								
<b>Competency Unit Code</b>		<b>Competency Type</b>	Core	<b>Level</b>	3	<b>Training Duration</b>	200	<b>Credit Hours</b>	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify electronic product quality control requirements	i. Product specification ii. Inspection procedure iii. Method of inspection iv. Bill of Material v. Tools and equipment to be used vi. Related standards such as : MS IEC International Standards Org. Malaysian Standards			20 hours	Lecture	i. Electronic product to be interpreted confirmed ii. Electronic product specification confirmed iii. Bill of material listed iv. Tools and equipments to be used listed

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		i. Identify product specification ii. Identify method of inspection iii. Interpret Bill Of Material iv. Identify tools and equipment to be used	<u>Attitude :</u> i. Meticulous and precise when identifying quality control procedures	20 hours	Demonstration, Observation & Practical	
2. Prepare Electronic Quality Control activities requirements	i. Quality control standards Quality control methods ii. Safety and precaution procedures iii. Product specification iv. Method of inspection v. Bill of Material vi. Tools and equipment to be used			20 hours	Lecture	i. Quality control standards obtained ii. Quality control methods determined iii. Safety and precaution procedures listed
		i. Determine Quality control standards ii. Determine Quality control methods iii. List out safety and precaution procedures	<u>Attitude :</u> i. Meticulous when preparing Quality Control requirements	20 hours	Demonstration and Observation	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			ii. Ensure reliability of Quality Control standard			
3. Perform Electronic Quality Control	i. Bill of material inspection ii. Function inspection iii. Physical inspection iv. Safety inspection v. Packaging inspection vi. Method of inspection: <ul style="list-style-type: none"> <li>• Random</li> <li>• Sampling</li> <li>• By Batch</li> </ul>			40 hours	Lecture	i. Materials quantity determined ii. Electronic equipment functionality checked as per specification iii. Equipment physical condition inspected iv. Equipment functionality accordance with standard regulation requirement v. Safety inspection conducted as per regulation requirement
		i. Perform inspection according to procedures ii. Perform function inspection according to procedures iii. Perform physical inspection iv. Perform safety inspection v. Perform packaging inspection	<u>Attitude :</u> i. Meticulous when ensuring Quality of product	40 hours	Demonstration Observation and	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			<ul style="list-style-type: none"> <li>ii. Accurate when executing Quality Control</li> <li>iii. Handle equipment carefully</li> </ul>			
4. Report inspection results to superior	<ul style="list-style-type: none"> <li>i. Inspection checklist sheet</li> <li>ii. Inspection result</li> <li>iii. Acknowledgement procedures</li> </ul>			20 Hours	Lecture	<ul style="list-style-type: none"> <li>i. Inspection checklist sheet obtained</li> <li>ii. Inspection result confirmed</li> <li>iii. Inspection procedure result acknowledge by supervisor</li> <li>iv. Inspection results report format determined</li> </ul>
		<ul style="list-style-type: none"> <li>i. Confirm inspection result</li> <li>ii. Prepare inspection result</li> <li>iii. inspection procedure result acknowledge by supervisor</li> <li>iv. Determine inspection results report format</li> </ul>	<u>Attitude :</u> <ul style="list-style-type: none"> <li>i. Ensure precise results</li> </ul>	20 hours	Demonstration	

## Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes 02.01 Interpret and follow manuals, instructions and SOP's 02.04 Prepare brief reports and checklist using standard form 03.03 Accept responsibility for own work and work area 03.05 Demonstrate safety skills 04.01 Organize own work activities 04.06 Allocate work 04.09 Prepare project/ work plans 06.02 Comply with and follow chain of command 06.01 Understand system 06.03 Identify and highlight problems	1. Communication skills 1. Conceptual skills 2. Interpersonal skills 3. Multitasking and prioritizing 4. Self-discipline 5. Teamwork 6. Learning skills 7. Leadership skills

## Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Quality Control policy and procedures	1:1

## References

### REFERENCES

1. Joseph . Raisse. (1968). *Electronic Troubleshooting*. H.W.Sams
2. R.Boylestad and L.Nashelsky. (1996). *Electronic Devices and Circuit Theory*. Prentice Hall- Gale
3. Albert Paul Malvino and Donald P. Leach. (1994). *Digital Principles And Application*. McGraw-Hill. (ISBN: 0028018214)
4. Al Williams. (2003). *Build your own Printed Circuit Board*. Mcgraw-hill (ISBN: 007142783X)
5. Joseph A. Risse. (1968). *Understanding electronic test equipment*. H. W. Sams

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	INDUSTRIAL ELECTRONICS								
<b>Job Area</b>	ELECTRONIC EQUIPMENT & APPLIANCE TROUBLESHOOTING, REPAIRING AND MAINTENANCE OPERATION								
<b>Competency Unit Title</b>	PROGRAMMABLE LOGIC CONTROLLER (PLC) CONFIGURATION								
<b>Competency Unit Descriptor</b>	Programmable Logic Controller (PLC) configuration is to carry out Programmable Logic Control (PLC) Configuration according to manufacturer's manual and specification. The personnel who are competent in Programmable Logic Controller (PLC) configuration shall be able to identify microprocessor chip/device specification, carry out product specification functionality, interpret the inspection result and prepare inspection results report.								
<b>Competency Unit Code</b>		<b>Competency Type</b>	Core	<b>Level</b>	3	<b>Training Duration</b>	150	<b>Credit Hours</b>	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify microprocessor chip/device	i. Types of microprocessor chip/device, such as; <ul style="list-style-type: none"> <li>• Microprocessor or processor</li> <li>• PLC</li> </ul> ii. Microprocessor architecture iii. Types of First Microprocessor iv. Arithmetic Logics Unit (ALU) v. Instruction Set or Instruction Set Architecture (ISA) vi. Memory and Address Bus <ul style="list-style-type: none"> <li>• Random Access Mem-</li> </ul>			20 hours	Lecture	i. Types of microprocessor chip/device determined ii. Microprocessor architecture identified iii. Type of First Microprocessor identified

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Memory (RAM)</li> <li>• Read Only Memory (ROM)</li> <li>• Address bus to identify the memory location (8, 16, 20 or more bits)</li> </ul> vii. Data Bus viii. Bus system					
		i. Identify types of microprocessor chip/device ii. Identify Microprocessor architecture iii. Identify type of First Microprocessor iv. Identify Arithmetic Logics Unit (ALU) v. Identify Instruction Set or Instruction Set Architecture (ISA) vi. Identify Memory and Address Bus vii. Determine Data Bus viii. Determine Bus system	<u>Attitude :</u> i. Meticulous and precise when identifying quality control procedures	40 hours	Demonstration, Observation & Practical	
2. Identify microprocessor programming language	i. Types of microprocessor programming language ii. Assembler functionality iii. Types of assembler			20 hours	Lecture	i. Types of microprocessor programming language identified



Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	iv. Types of PLC hardware <ul style="list-style-type: none"> <li>• RAM</li> <li>• ROM</li> <li>• EEPROM</li> <li>• Input Module</li> <li>• Output Module</li> <li>• Power Supply</li> <li>• Central Processing unit (CPU)</li> <li>• Programming Device</li> <li>• Indicators Light</li> </ul>					ii. Function of assembler determined iii. Assembler listed out iv. PLC hardware listed
		i. Identify types of micro-processor programming language ii. Determine function of assembler iii. Identify types of assembler iv. Determine types of PLC hardware	<u>Attitude :</u> i. Meticulous when preparing Quality Control requirements ii. Ensure reliability of Quality Control standard	20 hours	Demonstration, Observation & Practical	
3. Obtain PLC device information /data sheet	i. CPU Unit Specification <ul style="list-style-type: none"> <li>• I/O Bits</li> <li>• User program memory</li> </ul>			20 hours	Lecture	i. CPU unit specification obtained ii. PLC programming instruction obtained

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Data memory</li> <li>• Extended data memory</li> <li>• Current Consumption</li> <li>ii. Common Specification               <ul style="list-style-type: none"> <li>• Instruction Length</li> <li>• Number of expansion rack</li> <li>• Timer Area</li> <li>• Counter Area</li> </ul> </li> <li>iii. Function Specification               <ul style="list-style-type: none"> <li>• Constant cycle time</li> <li>• Serial Communication</li> <li>• Clock</li> <li>• Battery Life</li> <li>• Flash Memory slot</li> </ul> </li> <li>iv. General Specification               <ul style="list-style-type: none"> <li>• Power Supply Voltage</li> <li>• Operating voltage range</li> <li>• Power Consumption</li> <li>• Output Capacity</li> <li>• Ambient Operating Temperature</li> </ul> </li> <li>v. Output Unit               <ul style="list-style-type: none"> <li>• Triac</li> </ul> </li> </ul>					iii. Determine PLC unit component

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Transistor</li> <li>vi. PLC programming Instruction               <ul style="list-style-type: none"> <li>• List of Standard Instruction</li> <li>• Conversion of Conventional Control Circuit to PLC Ladder Diagram</li> <li>• List of mnemonic code, such as;                   <ul style="list-style-type: none"> <li>- Address</li> <li>- Instruction</li> <li>- Operands</li> </ul> </li> </ul> </li> <li>vii. PLC unit component               <ul style="list-style-type: none"> <li>• LED Indicators</li> <li>• Memory Card Indicators</li> <li>• Memory Card Power Supply Switch</li> <li>• Memory Card Eject Button</li> <li>• DIP Switch</li> <li>• Memory Card Connector</li> <li>• Memory Card</li> <li>• Inner Board Connector Compartment</li> <li>• RS-232C Port</li> </ul> </li> </ul>					

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>Peripheral Port</li> </ul>	<ol style="list-style-type: none"> <li>Acquire CPU Unit specification</li> <li>Acquire common specification</li> <li>Acquire function specification</li> <li>Acquire general specification</li> <li>Determine output unit</li> <li>Determine PLC programming instruction</li> <li>Acquire PLC unit components</li> </ol>	<p><u>Attitude :</u></p> <ol style="list-style-type: none"> <li>Meticulous when ensuring Quality of product</li> <li>Accurate when executing Quality Control</li> <li>Handle equipment carefully</li> </ol>	20 hours	Demonstration, Observation & Practical	
4. Check hardware connection	<ol style="list-style-type: none"> <li>Back up battery</li> <li>Power supply (24VDC / 220 VAC)</li> <li>Input wiring</li> <li>Output wiring</li> <li>peripheral port Setting and RS-232C <ul style="list-style-type: none"> <li>Used programming console – pin 4 OFF</li> <li>Used other than programming console connected to RS-232C – pin 5 ON.</li> </ul> </li> </ol>			20 hours	Lecture	<ol style="list-style-type: none"> <li>Back up battery checked</li> <li>Power supply connected</li> <li>Input and output wiring determined</li> <li>DIP setting on the CPU unit determined</li> </ol>

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		i. Check back up battery ii. Connect power supply iii. Determine input wiring iv. Determine output wiring v. Determine DIP setting on the CPU unit	<u>Safety :</u> i. When 220VAC power supplied, be sure to remove jumper bar that shorts the voltage selector terminals.	20 hours	Demonstration, Observation & Practical	
5. Run the program	i. Programming Console Mode Switch to PROGRAM mode. ii. Programming Console iii. Transferring the program programming language iv. PLC communication <ul style="list-style-type: none"> <li>• RS-232C, 9-pin</li> <li>• Ethernet or EIA485</li> <li>• Device NET</li> </ul> v. Output wiring vi. Input wiring vii. Trial Operation viii. Program for syntax errors. ix. Fatal and non-fatal error. x. Monitoring and Debugging <ul style="list-style-type: none"> <li>• Force-Set and Force-Reset</li> <li>• Differentiation Monitor</li> <li>• Time Chart Monitoring</li> <li>• Data Tracing</li> <li>• Online Editing</li> </ul>			15 hours	Lecture	i. Power supply unit POWER indicator is checked ii. Programming Console checked iii. Input and output of wiring checked iv. Programming language loaded v. PLC communication checked

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> <li>i. Check program for syntax errors</li> <li>ii. Check fatal and non – fatal error</li> <li>iii. Assess monitoring and debugging</li> </ul>	<u>Safety :</u> <ul style="list-style-type: none"> <li>i. Check the voltage selector terminals (just below the power input terminal on the power supply unit)</li> </ul>	22 hours	Demonstration, Observation & Practical	<ul style="list-style-type: none"> <li>i. Program for syntax errors checked</li> <li>ii. Fatal and non-fatal error checked</li> <li>iii. Monitoring and debugging assessed</li> </ul>
6. Report PLC Configuration activities	<ul style="list-style-type: none"> <li>i. Programming result</li> <li>ii. Output operation</li> <li>iii. Report format</li> </ul>			5 hours	Lecture	<ul style="list-style-type: none"> <li>i. Programming result assessed</li> <li>ii. Operation report produced and submitted to superior</li> </ul>
		<ul style="list-style-type: none"> <li>i. Determine function of program</li> <li>ii. Evaluate programming result</li> <li>iii. Determine function of hardware</li> <li>iv. Test hardware</li> <li>v. Report output operation</li> <li>vi. Utilise application software</li> </ul>	<u>Attitude :</u> <ul style="list-style-type: none"> <li>i. Meticulous in recording report</li> </ul>	5 hours	Demonstration, Observation & Practical	

## Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes 02.01 Interpret and follow manuals, instructions and SOP's 02.04 Prepare brief reports and checklist using standard form 03.03 Accept responsibility for own work and work area 03.05 Demonstrate safety skills 04.01 Organize own work activities 04.06 Allocate work 04.09 Prepare project/ work plans 06.02 Comply with and follow chain of command 06.01 Understand system 06.03 Identify and highlight problems	1. Communication skills 1. Conceptual skills 2. Interpersonal skills 3. Multitasking and prioritizing 4. Self-discipline 5. Teamwork 6. Learning skills 7. Leadership skills

## Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Test bench 2. Instrument & Test Equipment 3. Hand Tools 4. Tagging material 5. Equipment Manual	1:5 1:1 1:1 1:2 1:1

## References

### REFERENCES

1. OMRON . (1999). *A Beginner Guide to PLC*. OMRON Asia Pacific PTE.LTD
2. Colin D. Simpson. (1994).*Programmable Logic Controllers Regents*. Prentice Hall
3. Joseph A. Risse. 1968. *Understanding electronic test equipment*. H. W. Sams
4. Al Williams. 1993. *Build your own Printed Circuit Board* (ISBN: 007142783X). Mcgraw-hill
5. Stephen S. Heineman, George W. Genevro . 1979. *Machine Tools Process and Applications*. Canfield Press
6. Cyril W. Lander. 1994. *Power Electronics*. McGraw-Hill



## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	INDUSTRIAL ELECTRONICS								
<b>Job Area</b>	ELECTRONIC EQUIPMENT INSTALLATION, TROUBLESHOOTING & MAINTENANCE								
<b>Competency Unit Title</b>	ELECTRONIC EQUIPMENT PREVENTIVE MAINTENANCE								
<b>Competency Unit Descriptor</b>	Electronic equipment preventive maintenance is to carry out services and maintenance electronic equipment preventive according to manufacturer's manual and specification. The personnel who are competent in electronic equipment preventive maintenance shall be able to identify electronic equipment preventive, carry out electronic equipment preventive functionality, inspect the equipment adjustment as per specifications and complete service book report								
<b>Competency Unit Code</b>		<b>Competency Type</b>	Core	<b>Level</b>	3	<b>Training Duration</b>	160	<b>Credit Hours</b>	
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Applied Skills</b>	<b>Attitude / Safety / Environmental</b>		<b>Training Hours</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>		
1. Identify the electronic equipment to be service and maintained	i. Occupational Safety & Health Act 514 (OSHA) 1994 requirements ii. Type of electronic equipments such as: <ul style="list-style-type: none"> <li>• Local Terminal</li> <li>• Photostat Machine</li> <li>• Printer</li> </ul> iii. Non acceptable condition of equipment which include: <ul style="list-style-type: none"> <li>• Dented</li> <li>• Scratched</li> <li>• Intermittent</li> </ul>		<u>Attitude :</u>  <u>Safety :</u> <ul style="list-style-type: none"> <li>i. Adhere to OSHA requirements</li> </ul>		3 hours	Lecture	i. Electronic equipment condition listed out		

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		i. Determine Occupational Safety & Health Act 514 (OSHA) 1994 requirements ii. Determine the electronic equipment iii. Determine condition of the electronic equipment		5 hours	Demonstration, Observation & Practical	
2. Prepare the preventive tools and maintenance tool and material	i. Types of preventive maintenance tools such as: <ul style="list-style-type: none"> <li>• common tool</li> <li>• meter</li> <li>• soldering iron</li> </ul> ii. Types of material such as: <ul style="list-style-type: none"> <li>• IPA ( )</li> <li>• Clothes</li> <li>• Cotton bud</li> <li>• Sucker</li> <li>• Vacuum</li> </ul> iii. Preventive maintenance safety and precaution procedures			3 hours	Lecture	i. Preventive maintenance tools obtained ii. Preventive maintenance materials obtained
		i. Determine preventive maintenance tools ii. Determine preventive maintenance material iii. Follow preventive maintenance safety and pre-		5 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		caution procedure	<u>Attitude :</u> i. Adhere safety procedure ii. Correct tools for the correct job  <u>Safety :</u> i. Handle tool with care			
3. Identify maintenance schedule record	i. Maintenance schedule record ii. Checklist record			3 hours	Lecture	i. Maintenance schedule referred ii. Checklist record filled out
		i. Prepare maintenance schedule ii. Prepare checklist record iii. Apply maintenance schedule writing skills	<u>Attitude :</u> i. Meticulous when prepare maintenance schedule	5 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
4. Identify location of the electronic equipment	i. Type of location such as: <ul style="list-style-type: none"> <li>• Office</li> <li>• Home</li> </ul> ii. Location condition			4 hours	Lecture	i. Equipment area identified
		i. Determine preventive maintenance area ii. Determine location operation		5 hours	Demonstration, Observation & Practical	
5. Check service manual and contents	i. Equipment service manual ii. Equipment circuit diagram iii. Power source iv. Equipment safety and precaution procedure			5 hours	Lecture	i. Equipment circuit diagram and manual referred ii. Fault electronic component identified iii. Power source identified

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		i. Interpret equipment circuit diagram & manual ii. Check electronic component iii. Check power source iv. Follow equipment safety and precaution procedure	<u>Attitude :</u> i. Adhere standard safety procedures ii. Handle equipment with care  <u>Safety :</u> i. Avoid from electrical shock ii. Wear appropriate Personal Protective Equipment (PPE)	5 hours	Demonstration, Observation & Practical	
6. Check power source	i. Power source <ul style="list-style-type: none"> <li>• incoming power source</li> <li>• voltage</li> </ul> ii. Maintenance tools <ul style="list-style-type: none"> <li>• meter</li> <li>• test pen</li> </ul> iii. Voltage range / type <ul style="list-style-type: none"> <li>- AC power</li> <li>- DC power</li> </ul>			10 hours	Lecture	i. Maintenance tools identified ii. Power source identified

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		i. Operate maintenance tools ii. Test power source using correct meter iii. Determine power source	<u>Attitude :</u> i. Follow procedure ii. Use correct tool for correct job  <u>Safety :</u> i. Wear appropriate Personal Protective Equipment (PPE)	12 hours	Demonstration, Observation & Practical	
7. Dismantle electronics equipment	i. Electronics part ii. Manual book / diagram iii. Service tools			8 hours	Lecture	i. Electronic parts serviced according to service manual
		i. Determine electronic parts to serviced ii. Operate service tools iii. Interpret manual book / diagrams	<u>Attitude :</u> i. Use correct tool for correct job	10 hours	Demonstration, Observation & Practical	



Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
9. Assemble electronics equipment part	i. Electronic equipment part and component ii. Equipment assembly tool iii. Manual book / diagram	i. Able to used correct tool ii. Interpret manual book / diagram	<u>Attitude :</u> i. Use correct tool for correct job  <u>Safety :</u> i. Follow standard safety procedure ii. Handle tools with care	8 hours  10 hours	Lecture  Demonstration, Observation & Practical	i. Tools operate appropriately ii. Manual book / diagram referred
10. Inspect the equipment adjustment as per specifications	i. Manual book / diagram ii. Tool for adjustment which include: <ul style="list-style-type: none"> <li>• Power supply / voltage</li> <li>• Colour</li> <li>• Speed</li> </ul>	i. Interpret manual book / diagram ii. Able to used correct tool	<u>Attitude :</u> i. Use correct tool for correct job	8 hours  8 hours	Lecture  Demonstration, Observation & Practical	





Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
12. Complete the test check list as per specification	<ul style="list-style-type: none"> <li>i. Types of checklist</li> <li>ii. Procedure to fill in check-list</li> </ul>	<ul style="list-style-type: none"> <li>i. Determine type of checklist</li> <li>ii. Fill in checklist</li> </ul>	<p><u>Attitude :</u></p> <ul style="list-style-type: none"> <li>i. Meticulous when fill in checklist</li> </ul> <p><u>Safety :</u> Not applicable</p>	<p>2 hours</p> <p>2 hours</p>	<p>Lecture</p> <p>Demonstration, Observation &amp; Practical</p>	<ul style="list-style-type: none"> <li>i. Equipment test check executed</li> </ul>
13. Complete service book reports	<ul style="list-style-type: none"> <li>i. Report writing skills</li> <li>ii. Format of report</li> </ul>	<ul style="list-style-type: none"> <li>i. Determine formats of report</li> <li>ii. Check report</li> </ul>	<p><u>Attitude :</u></p> <ul style="list-style-type: none"> <li>i. Meticulous in writing</li> <li>ii. Adhere report submission dateline</li> </ul> <p><u>Safety :</u> Not Applicable</p>	<p>2 hours</p> <p>2 hours</p>	<p>Lecture</p> <p>Demonstration, Observation &amp; Practical</p>	<ul style="list-style-type: none"> <li>i. Service book report compiled</li> <li>ii. Service book report submitted to superior</li> </ul>

## Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes 02.01 Interpret and follow manuals, instructions and SOP's 02.04 Prepare brief reports and checklist using standard form 03.03 Accept responsibility for own work and work area 03.05 Demonstrate safety skills 04.01 Organize own work activities 04.06 Allocate work 04.09 Prepare project/ work plans 06.02 Comply with and follow chain of command 06.01 Understand system 06.03 Identify and highlight problems	1. Communication skills 1. Conceptual skills 2. Interpersonal skills 3. Multitasking and prioritizing 4. Self-discipline 5. Teamwork 6. Learning skills 7. Leadership skills

## Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Work order 2. Preventive Maintenance Tools, Equipment and material 3. Testing Equipment 4. Checklist 5. Service Tools 6. Equipment Service Manual	1:1 1:2 1:2 1:1 1:2 1:1

## References

### REFERENCES

1. Total Quality Management reference books
2. R.A. Bravery and A.P. (1974)*Television and Electronic Servicing* Gilbert Newnes / Butterworths,
3. Wayne Lemons, Transistor (1972). *Radio Servicing Course*. Howard W. Sams and Company,
4. Joseph A. Risse, 1968. *Understanding Electronic Test Equipment*. H. W. Sams, ,
5. Bernard Grob. (1997). *Basic Electronics*. McGraw-Hill
6. Joseph A. Risse. (1968). *Understanding electronic test equipment*. H. W. Sams

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<b>Sub Sector</b>	INDUSTRIAL ELECTRONICS					
<b>Job Area</b>	ELECTRONIC PRODUCT TROUBLESHOOTING, REPAIR AND MAINTENANCE					
<b>Competency Unit Title</b>	ELECTRONIC EQUIPMENT CORRECTIVE MAINTENANCE					
<b>Competency Unit Descriptor</b>	Electronic equipment corrective maintenance is to carry out services and maintenance electronic equipment corrective according to manufacturer's manual and specification. The personnel who are competent in electronic equipment corrective maintenance shall be able to identify the electronic tools, equipments and materials, check service manual and content, perform troubleshooting, functionality test and electronic equipment corrective maintenance report submitted to superior.					
<b>Competency Unit Code</b>		<b>Level</b>	3	<b>Training Duration</b>	195 hours	<b>Credit Hours</b>

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify the electronic tools, equipments and materials	i. Occupational Safety & Health Act 514 (OSHA) 1994 requirement ii. Types of electronic equipment iii. Condition of electronic equipment such as: <ul style="list-style-type: none"> <li>• Good</li> <li>• Faulty</li> <li>• Intermittent</li> </ul> iv. Types of damage at electronic equipment such as: <ul style="list-style-type: none"> <li>• Component</li> <li>• Motor</li> </ul> v. Identify tools <ul style="list-style-type: none"> <li>• Common tool</li> <li>• Meter</li> <li>• Soldering iron</li> </ul>			15 hours	Lecture	i. Electronic equipment for service and maintenance ii. Electronic equipment service and maintenance manual obtained iii. Tool and materials listed iv. Maintenance record interpreted

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	vi. Identify material <ul style="list-style-type: none"> <li>• Electronic component</li> <li>• Motor</li> <li>• Card</li> </ul> vii. Identify location <ul style="list-style-type: none"> <li>• Home</li> <li>• Office</li> <li>• Factory</li> </ul>					
		i. Determine Occupational Safety & Health Act 514 (OSHA) 1994 requirements ii. Determine electronic component and equipment iii. Identify the damaged electronics equipment iv. Identify location of electronic equipment	<u>Attitude:</u> i. Meticulous in identifying the tools, equipments and material	15 hours	Demonstration, Observation & Practical	
2. Check service manual and contents	i. Service manual ii. Circuit diagram iii. safety and precaution procedure iv. Power source			20 hours	Lecture	i. Location determined ii. Service manual obtained iii. Service manual in-

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Incoming power source</li> <li>• Voltage</li> </ul> v. Tools <ul style="list-style-type: none"> <li>• Meter</li> <li>• Test pen</li> </ul> vi. Voltage range / type <ul style="list-style-type: none"> <li>• AC power</li> <li>• DC power</li> </ul>					terpreted
		i. Interpret circuit diagram and manual ii. Ensure electronic component iii. Identify power source iv. Test power source using correct meter	<u>Attitude:</u> i. Careful in handling power source  <u>Safety:</u> i. Follow work procedure ii. Safety and precaution procedure	15 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
3. Perform troubleshooting	<ul style="list-style-type: none"> <li>i. Parts for corrective maintenance</li> <li>ii. Faulty electronic equipment</li> <li>iii. Circuit diagram</li> <li>iv. Electronic component</li> <li>v. Material and tool</li> <li>vi. Manual operation</li> <li>vii. Power source</li> <li>viii. Types of electronic equipment control</li> <li>ix. Function of electronic equipment control</li> <li>x. Operating procedure of electronic equipment and test equipment</li> <li>xi. Types of checklist</li> <li>xii. Procedure to fill in checklist</li> </ul>			40 hours	Lecture	<ul style="list-style-type: none"> <li>i. Parts for corrective determined</li> <li>ii. Power source determined</li> <li>iii. Electronic component determined</li> <li>iv. Faulty equipment tracked</li> <li>v. Electronic equipment specification checked against delivery order</li> <li>vi. Equipment functionality test procedures confirmed</li> </ul>
		<ul style="list-style-type: none"> <li>i. Identify part for corrective</li> <li>ii. Identify power source</li> <li>iii. Identify electronic component</li> <li>iv. Determine faulty equipment</li> <li>v. Read diagram</li> <li>vi. Operate electronic equipment</li> <li>vii. Carry out corrective work according to procedure</li> <li>viii. Identify control</li> </ul>		60 hours	Demonstration, Observation & Practical	



Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		ix. Determine function of control x. Determine type of checklist xi. Fill in checklist xii. Test checklist as per specification	<u>Attitude :</u> i. Adhere safety procedure  <u>Safety :</u> i. Safety and precaution			
4. Report electronic equipment corrective maintenance activities	i. Report writing skills ii. Procedures to write electronic equipment corrective maintenance report			2 hours	Lecture	i. Electronic equipment corrective maintenance report written according to report format ii. Electronic equipment corrective
		i. Check report content ii. Utilise office productivity software iii. Produce electronic equipment corrective maintenance report according to report format	<u>Attitude :</u> i. Meticulous in electronic equip-	20 hours	Demonstration, Observation & Practical	iii. Maintenance report presented to client

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
			ment corrective maintenance report index analysis re- port ii. Adhere to re- port submission dateline			

### Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes 02.01 Interpret and follow manuals, instructions and SOP's 02.04 Prepare brief reports and checklist using standard form 03.03 Accept responsibility for own work and work area 03.05 Demonstrate safety skills 04.01 Organize own work activities 04.06 Allocate work 04.09 Prepare project/ work plans 06.02 Comply with and follow chain of command 06.01 Understand system 06.03 Identify and highlight problems	1. Communication skills 1. Conceptual skills 2. Interpersonal skills 3. Multitasking and prioritizing 4. Self-discipline 5. Teamwork 6. Learning skills 7. Leadership skills

## Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Printed Circuit Board (PCB)	1:5
2. Card	1:5
3. TV	1:20
4. Meter	1:5
5. Test pen	1:1

## References

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<ol style="list-style-type: none"><li>1. Axelson. J.L. &amp; Axelson J. (1993). <i>Making Printed Circuit Board</i>. McGraw-Hill Professional Publishing.</li><li>2. Al-William. (2003). <i>Build Your Own Printed Circuit Board</i>. McGraw-Hill</li><li>3. R.Boylestad and L.Nashelsky. (1996). <i>Electronic Devices and Circuit Theory</i>. Prentice Hall- Gale</li><li>4. Albert Paul Malvino and Donald P. Leach. (1994). <i>Digital Principles And Application</i>. McGraw-Hill. (ISBN: 0028018214)</li><li>5. Al Williams. (2003). <i>Build your own Printed Circuit Board</i>. Mcgraw-hill (ISBN: 007142783X)</li><li>6. Joseph A. Risse. (1968). <i>Understanding electronic test equipment</i>. H. W. Sams</li></ol>

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	INDUSTRIAL ELECTRONICS						
<b>Job Area</b>	ELECTRONIC PRODUCT TROUBLESHOOTING,REPAIR AND MAINTENANCE OPERATION						
<b>Competency Unit Title</b>	ELECTRONIC APPLIANCE REPAIR & MAINTENANCE						
<b>Competency Unit Descriptor</b>	Electronic appliance repair and maintenance is to carry out repair and maintenance on electronic appliances according to manufacturer's manual and specification. The personnel who are competent in electronic appliance repair and maintenance shall be able to identify the electronic tools, appliances and materials, check repair manual and content, perform troubleshooting, functionality test and electronic appliance repair and maintenance report submitted to superior.						
<b>Competency Unit Code</b>		<b>Level</b>	3	<b>Training Duration</b>	124 hours	<b>Credit Hours</b>	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
1. Identify the electronic appliance repair and maintenance requirements	i. Types of electronic appliance (such as television, radio and etc.) ii. Condition of electronic appliance such as: <ul style="list-style-type: none"> <li>• Good</li> <li>• Faulty</li> <li>• Intermittent</li> </ul> iii. Types of damage of electronic appliance such as: <ul style="list-style-type: none"> <li>• Component</li> <li>• Motor</li> </ul> iv. Maintenance tools v. Location of repair / maintenance work: <ul style="list-style-type: none"> <li>• Home</li> <li>• Office</li> </ul>			15 hours	Lecture	i. Electronic appliance for repair and maintenance ii. Electronic appliance repair and maintenance manual obtained iii. Tool and materials listed iv. Maintenance record interpreted v. Location determined

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	<ul style="list-style-type: none"> <li>• Factory</li> <li>vi. Repair manual</li> <li>vii. Circuit diagram</li> <li>viii. safety and precaution procedure</li> <li>ix. Power source</li> <li>x. Incoming power source               <ul style="list-style-type: none"> <li>• Voltage</li> <li>• Tools</li> <li>• Meter</li> <li>• Test pen</li> </ul> </li> <li>xi. Voltage range / type               <ul style="list-style-type: none"> <li>• AC power</li> <li>• DC power</li> </ul> </li> </ul>			15 hours	Lecture	
		<ol style="list-style-type: none"> <li>i. Determine electronic component and appliance</li> <li>ii. Identify the damaged electronics appliance</li> <li>iii. Identify location of electronic appliance repair/maintenance work</li> <li>iv. Interpret circuit diagram &amp; manual</li> <li>v. Ensure electronic component</li> <li>vi. Identify power source</li> <li>vii. Test power source using</li> </ol>		20 Hours	Demonstration Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		correct meter	<u>Attitude:</u> i. Meticulous in identifying the tools, appliances and material ii. Careful in handling power source  <u>Safety:</u> i. Follow work procedure ii. Safety and precaution procedure			
2. Perform electronic appliance repair and maintenance	i. Parts for repair and maintenance ii. Faulty electronic appliance Circuit diagram iii. Electronic component iv. Material and tool v. Manual operation vi. Power source vii. Types of electronic appliance control viii. Function of electronic appliance control ix. Operating procedure of electronic appliance and test appliance x. Types of checklist xi. Procedure to fill in check-			20 hours	Lecture	i. Parts for repair and determined ii. Power source determined iii. Electronic component determined iv. Faulty appliance tracked v. Electronic appliance specification checked against delivery order vi. Appliance functionality test procedures confirmed

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
	list					
		i. Identify part for repair and ii. Identify power source iii. Identify electronic component iv. Determine faulty appliance v. Read diagram vi. Operate electronic appliance vii. Carry out repair and work according to procedure viii. Fill in checklist ix. Test electronic appliance as per specification	<u>Attitude :</u> i. Follow procedure  <u>Safety :</u> i. Safety and precaution	40 hours	Demonstration Observation & Practical	
3. Report electronic appliance repair and maintenance activities	i. Report writing skills ii. Procedures to write electronic appliance repair and maintenance report			6 hours	Lecture	i. Electronic appliance repair and maintenance report written according to report format ii. Electronic appliance repair and

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
						maintenance report presented
		<ul style="list-style-type: none"> <li>i. Check report content</li> <li>ii. Utilise office productivity software</li> <li>iii. Produce electronic appliance repair and maintenance report according to report format</li> </ul>	<p><u>Attitude :</u></p> <ul style="list-style-type: none"> <li>i. Meticulous in electronic appliance repair and maintenance report index analysis report</li> <li>ii. Adhere to report submission dateline</li> </ul>	8 hours	Demonstration Observation & Practical	



## Employability Skills

Core Abilities	Social Skills
01.01 Identify and gather information 02.01 Interpret and follow manuals, instructions and SOP's 02.04 Prepare brief reports and checklist using standard form 06.01 Understand system	1. Communication skills 2. Conceptual skills 3. Interpersonal skills 4. Multitasking and prioritizing 5. Self-discipline 6. Teamwork

## Tools, Appliance and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Printed Circuit Board (PCB)	1:5
2. Card	1:5
3. TV	1:20
4. Meter	1:5
5. Test pen	1:1

## References

## REFERENCES

1. Axelson. J.L. & Axelson J. (1993). *Making Printed Circuit Board*. McGraw-Hill Professional Publishing.
2. Al-William. (2003). *Build Your Own Printed Circuit Board*. McGraw-Hill
3. Joseph . Raisse. (1968). *Electronic Troubleshooting*. H.W.Sams
4. R.Boylestad and L.Nashelsky. (1996). *Electronic Devices and Circuit Theory*. Prentice Hall- Gale
5. Albert Paul Malvino and Donald P. Leach. (1994). *Digital Principles And Application*. McGraw-Hill. (ISBN: 0028018214)
6. Al Williams. (2003). *Build your own Printed Circuit Board*. Mcgraw-hill (ISBN: 007142783X)
7. Joseph A. Risse. (1968). *Understanding electronic test equipment*. H. W. Sams

## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	INDUSTRIAL ELECTRONICS								
<b>Job Area</b>	ELECTRONIC EQUIPMENT & APPLIANCE TROUBLESHOOTING, REPAIRING AND MAINTENANCE OPERATION								
<b>Competency Unit Title</b>	FLOOR SUPERVISION								
<b>Competency Unit Descriptor</b>	Floor supervision is a list of competency for personnel in their field of work to supervise and coordinate work implementation according their working environment and adhering to company policies, procedure, rules and regulations. The personnel who are competent in the floor supervision must be able to monitor work progress, conduct section briefing, carry out staff training, provide appraisal accommodation, implement safety measures, carry out customer and inter departmental liaison, prepare section budget, prepare technical report								
<b>Competency Unit Code</b>		<b>Competency Type</b>	Core	<b>Level</b>	3	<b>Training Duration</b>	104	<b>Credit Hours</b>	
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Applied Skills</b>	<b>Attitude / Safety / Environmental</b>		<b>Training Hours</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>		
1. Monitor work progress	<ul style="list-style-type: none"> <li>i. Procedure to prepare work schedule</li> <li>ii. Organization chart</li> <li>iii. Staff job function</li> <li>iv. Procedure to distribute work schedule</li> <li>v. Procedure to monitor work schedule</li> </ul>				3 hours	Lecture	<ul style="list-style-type: none"> <li>i. Work schedule prepared correctly</li> <li>ii. Staff job function interpreted list out correctly</li> </ul>		
		<ul style="list-style-type: none"> <li>i. Prepare work schedule</li> <li>ii. Determine job function</li> <li>iii. Determine to distribute work schedule</li> <li>iv. Determine to monitor work schedule</li> <li>v. Check work performance against work schedule</li> </ul>	<u>Attitude:</u> <ul style="list-style-type: none"> <li>i. Ensure schedule is prepared according to dateline</li> <li>ii. Ensure planning and work schedule regularly check</li> </ul>		10 hours	Demonstration, Observation & Practical			

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
2. Conduct section briefing	i. Topic for briefing ii. Briefing information iii. Target audience iv. Communication skill			3 hours	Lecture	i. Briefing information prepared correctly ii. Briefing carry out effectively
		i. Determine briefing topic ii. Compile briefing information iii. Convey information to staff	<u>Attitude:</u> i. Communicate effectively ii. Ensure briefing content prepare before conducting staff briefing	10 hours	Demonstration, Observation & Practical	
3. Carry out staff training	i. Type of training, such as: <ul style="list-style-type: none"> <li>• On Job Training</li> <li>• Off The Job Training</li> <li>• Cross exposure program</li> </ul> ii. Supervisory, mentoring and coaching iii. Types of training materials iv. Motivating and counseling skill v. Presentation and demonstration skill			3 hours	Lecture	i. Types of training determined correctly according to staff training needs ii. Training material list out correctly
		i. Determine types of training ii. Compile training materials	<u>Attitude:</u> i. Meticulous in recording staff disciplinary form	10 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> <li>iii. Present training content</li> <li>iv. Demonstrate practical skill</li> </ul>				
4. Provide appraisal accommodation	<ul style="list-style-type: none"> <li>i. Types of staff appraisal</li> <li>ii. Staff records</li> <li>iii. Personnel appraisal form</li> <li>iv. Work evaluation skill</li> </ul>			3 hours	Lecture	<ul style="list-style-type: none"> <li>i. Types of staff appraisal method determined correctly</li> <li>ii. Staff record interpreted</li> <li>iii. Personnel appraisal form filled in according to procedure</li> <li>iv. Staff performance appraised as per checklist</li> </ul>
		<ul style="list-style-type: none"> <li>i. Determine types of appraisal method</li> <li>ii. Acquire staff records</li> <li>iii. Acquire personnel appraisal form</li> <li>iv. Appraise staff performance</li> </ul>	<u>Attitude:</u> <ul style="list-style-type: none"> <li>i. Appraise staff in a fair manner</li> </ul>	10 hours	Demonstration, Observation & Practical	
5. Implement safety measures	<ul style="list-style-type: none"> <li>i. Type of hazards</li> <li>ii. Procedures for first aid</li> <li>iii. Types of safety equipment</li> <li>iv. Occupational Safety &amp; Health Act</li> <li>v. Application of first aid kit</li> <li>vi. Various type of accident</li> </ul>			3 hours	Lecture	<ul style="list-style-type: none"> <li>i. Types of hazard listed out</li> <li>ii. Procedures of first aid applied correctly</li> <li>iii. Types of safety equipment listed out correctly</li> <li>iv. Application of first aid kit determined correctly</li> </ul>
		<ul style="list-style-type: none"> <li>i. Determine types of hazard</li> <li>ii. Apply procedures of first aid</li> <li>iii. Determine types of safety equipment</li> <li>iv. Adhere Occupational</li> </ul>	<u>Attitude:</u> <ul style="list-style-type: none"> <li>i. Ensure first aid kit check for expired date and fill according to requirement</li> </ul>	10 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		v. Safety & Health Act Determine application of first aid kit vi. Determine types of accident				
6. Carry out customer and inter departmental liaison	i. Communication skill ii. Types of correspondence activities iii. Organization chart iv. Procedure to handle customer complaint			3 hours	Lecture	i. Liaison procedure listed out according to company procedure ii. Customer profile interpreted iii. Types of correspondence activities determined iv. Customer complaints handled according to company procedure
		i. Determine liaison activities procedure ii. Determine customer profile iii. Determine types of correspondence activities iv. Apply procedure to handle customer complaint	<u>Attitude:</u> i. Adhere to company procedure for liaison activities	10 hours	Demonstration, Observation & Practical	
7. Prepare section budget	i. Budgetary procedures ii. Expenditure report iii. Financial report iv. Type of section revenue			3 hours	Lecture	i. Briefing data information prepared ii. Unit of briefing conducted iii. Company budgetary procedures listed out iv. Section's expenditure report interpreted correctly v. Section expenditure estimated correctly
		i. Determine budgetary procedures ii. Interpret current section's expenditure report iii. Determine type of section revenue	<u>Attitude:</u> i. Ensure all section expenditure calculated correctly	10 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<ul style="list-style-type: none"> <li>iv. Estimate section expenditure</li> <li>v. Anticipate section revenue</li> <li>vi. Produce section budget forecast report</li> </ul>				<ul style="list-style-type: none"> <li>vi. Section revenue anticipated correctly according to sales target</li> </ul>
8. Prepare technical report	<ul style="list-style-type: none"> <li>i. Procedure to write report</li> <li>ii. Organization chart</li> <li>iii. Types of report</li> <li>iv. Various type of report format</li> <li>v. Writing skill</li> <li>vi. Presentation skill</li> </ul>			3 hours	Lecture	<ul style="list-style-type: none"> <li>i. Procedure to write report listed out</li> <li>ii. Report format determined correctly according to reports requirement</li> </ul>
		<ul style="list-style-type: none"> <li>i. Determine procedure to write report</li> <li>ii. Determine types of report</li> <li>iii. Determine various type of report format</li> <li>iv. Write report according to report format</li> <li>v. Present report to superior</li> </ul>	<u>Attitude:</u> <ul style="list-style-type: none"> <li>i. Meticulous in writing report</li> </ul>	10 hours	Demonstration, Observation & Practical	<ul style="list-style-type: none"> <li>iii. Report write according to correct format</li> <li>iv. Report presented to superior according to procedure</li> </ul>

## Employability Skills

Core Abilities	Social Skills
<p>01.01 Identify and gather information</p> <p>01.02 Document information, procedures or processes</p> <p>02.01 Interpret and follow manuals, instructions and SOP's</p> <p>02.04 Prepare brief reports and checklist using standard form</p> <p>03.03 Accept responsibility for own work and work area</p> <p>03.05 Demonstrate safety skills</p> <p>04.01 Organize own work activities</p> <p>04.06 Allocate work</p> <p>04.09 Prepare project/ work plans</p> <p>06.02 Comply with and follow chain of command</p> <p>06.01 Understand system</p> <p>06.03 Identify and highlight problems</p>	<p>1. Communication skills</p> <p>1. Conceptual skills</p> <p>2. Interpersonal skills</p> <p>3. Multitasking and prioritizing</p> <p>4. Self-discipline</p> <p>5. Teamwork</p> <p>6. Learning skills</p> <p>7. Leadership skills</p>



## Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1. Computer	1 : 1
2. Office equipment	1 : 10
3. Schedule chart	1 : 10
4. Organization chart	1 : 10
5. Manpower planning	1 : 10
6. Stationery items	As required
7. Company Standard Operating Procedure	1 : 5
8. Staff personnel file	1 : 1
9. Technical report	1 : 5
10. Operation records	1 : 5
11. Maintenance records	1 : 10
12. Projector	1 : 1
13. Appraisal forms	1 : 1

## References

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## CURRICULUM of COMPETENCY UNIT (CoCU)

<b>Sub Sector</b>	ELECTRICAL AND ELECTRONIC, TELECOMMUNICATION & BROADCASTING								
<b>Job Area</b>	ELECTRONIC EQUIPMENT & APPLIANCE TROUBLESHOOTING, REPAIRING AND MAINTENANCE OPERATION								
<b>Competency Unit Title</b>	MILITARY ELECTRONIC EQUIPMENT REPAIR AND MAINTENANCE								
<b>Competency Unit Descriptor</b>	Military Electronic Equipment Repair and Maintenance is to carry out process of repair and maintain of military electronic equipments according to the specification and standard operation of military equipment. Personnel who are competent in this profile shall be able to troubleshoot and identify the problem, repair the faulty equipment and carry out maintenance.								
<b>Competency Unit Code</b>		<b>Competency Type</b>	Core	<b>Level</b>	3	<b>Training Duration</b>	250 hours	<b>Credit Hours</b>	
<b>Work Activities</b>	<b>Related Knowledge</b>	<b>Applied Skills</b>	<b>Attitude / Safety / Environmental</b>		<b>Training Hours</b>	<b>Delivery Mode</b>	<b>Assessment Criteria</b>		
1. Identify Military Electronic Equipment Repair and Maintenance Requirements	<ul style="list-style-type: none"> <li>i. Electronic equipment used in military organization</li> <li>ii. Flow chart, SOP and process in army regulation.</li> <li>iii. Categories of several types of technical documentation and SOP.</li> <li>iv. Military electronic equipment to be repair identification</li> <li>v. Technical documentation and Standard Operating Procedures requirement</li> </ul>				20 hours	Lecture	<ul style="list-style-type: none"> <li>i. Theoretical/ knowledge assessment</li> <li>ii. Practical/ performance assessment</li> <li>iii. Student can perform to doing repair job according to manual and SOP</li> <li>iv. Student can perform to doing maintenance job according to manual and SOP</li> </ul>		
		<ul style="list-style-type: none"> <li>i. Determine classification of military electronic equipments.</li> <li>ii. Determine and perform process and procedures.</li> <li>iii. Interprets selected technical documentation and</li> </ul>	<u>Attitude:</u> <ul style="list-style-type: none"> <li>i. Responsibility.</li> <li>ii. Team working.</li> <li>iii. Tolerances</li> <li>iv. Follow safety rules and SOP</li> </ul>		30 hours	Demonstration, Observation & Practical			

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		SOP. iv. Determine job and classification of maintenance according to the equipments. vi. Select required technical documentation and SOP.	<u>Safety:</u> i. Occupational Health and Safety matters and any special hazards (e.g. environmental impact, etc.) are identified.			
2. Prepare Military Electronic Equipment Repair and Maintenance Requirements	i. Specific electronic equipment for troubleshoot. ii. Functionality of parts in military electronic equipments. iii. Maintenance equipment and spare parts according to a related equipment iv. Electronic equipment in military organization. v. Equipment requirement for troubleshooting process vi. Schematic diagram process vii. Cause of faulty for troubleshooting			20 hours	Lecture	i. Product design drawing requirement listed drawing activities listed ii. Product prototype drawing produced in accordance with design requirement. iii. Drawing dimensions confirmed iv. Drawing submitted to superior
		i. Determine specific electronic equipment for troubleshooting ii. Determine function of parts in military electronic equipments iii. Determine maintenance equipment and spare parts	<u>Attitude:</u> i. Responsibility. ii. Team working. iii. Tolerances iv. Follow safety rules and SOP	30 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		<p>according to a related equipment</p> <ul style="list-style-type: none"> <li>iv. Use electronic equipment in military organization.</li> <li>v. Set up test equipment required for troubleshooting process.</li> <li>vi. Interpret schematic diagram</li> <li>vii. Analyze cause of faulty.</li> </ul>	<p><u>Safety:</u></p> <ul style="list-style-type: none"> <li>i. Occupational Health and Safety matters and any special hazards (e.g. environmental impact, etc.) are identified.</li> </ul>			
3. Conduct Military Electronic Equipment Repair and Maintenance Requirements	<ul style="list-style-type: none"> <li>i. Initial Spare Parts (ISR) list according to the military equipment.</li> <li>ii. Process and procedures to demand spare part and component required.</li> <li>iii. Troubleshooting of using specific test equipment. schematic diagram, technical documentation and SOP specification</li> <li>iv. Procedure of technical manual</li> </ul>			20 hours	Lecture	<ul style="list-style-type: none"> <li>i. Electronic equipment for service and maintenance</li> <li>ii. Location determined</li> <li>iii. Power source determined</li> <li>iv. Adjustment carried out as per specification</li> <li>v. Test result confirmed</li> </ul>
		<ul style="list-style-type: none"> <li>i. Determine component, spare parts and ISR list.</li> <li>ii. Carry out process to get spare part and component.</li> <li>iii. Determine required spare part and component according to faulty part.</li> <li>iv. Perform troubleshoot using</li> </ul>	<p><u>Attitude:</u></p> <ul style="list-style-type: none"> <li>i. Responsibility.</li> <li>ii. Team working.</li> <li>iii. Tolerances</li> <li>iv. Follow safety rules and SOP</li> </ul>	30 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		specific test equipment. schematic diagram, technical documentation and SOP specification v. Read technical manual vi. Interpret cause of faulty vii. Adhere Standard Operating Procedure and technical documentation	<u>Safety:</u> i. Occupational Health and Safety matters and any special hazards (e.g. environmental impact, etc.) are identified.			
4. Assess Military Electronic Equipment Repair and Maintenance Requirements	i. Process and procedures to replace spare part and com- ponent. ii. Functionality of test equip- ment iii. Procedure to process data sheet iv. Equipment requirement test- ing v. Operational test of military electronic equipment vi. Necessary spare part and component vii. Maintenance schedule ac- cording data sheet.			20 hours	Lecture	i. Electronic equip- ment for service and maintenance ii. Location deter- mined iii. Power source de- termined iv. Adjustment carried out as per specifi- cation
		i. Perform component and spare parts replacement ii. Test equipment function using manual and calibrated test equipment. iii. Interpret and read data sheet and process iv. Conduct and set up test equipment required on		30 hours	Demonstration, Observation & Practical	

Work Activities	Related Knowledge	Applied Skills	Attitude / Safety / Environmental	Training Hours	Delivery Mode	Assessment Criteria
		testing v. Carry out operational test. vi. Replace necessary spare part and component. vii. Determine maintenance schedule according data sheet.				
5. Report Military Electronic Equipment Repair and Maintenance Activities	i. Format report ii. Technical report iii. Organization flow chart. iv. SOP for report approval v. Process to approval and verification vi. Maintenance report.			20 hours	Lecture	i. Military electronic equipment to be repair identified. ii. Troubleshoot process performed. iii. Required spare part and component according to faulty part identified. iv. Necessary spare part and component replaced. v. Repair report prepared.
		i. Prepare format report. ii. Write technical report vii. Submit a report for equipment functions approval. iii. Prepare maintenance report	<u>Attitude:</u> i. Meticulous in writing report	30 hours	Demonstration, Observation & Practical	

Core Abilities	Social Skills
01.01 Identify and gather information 01.02 Document information, procedures or processes 02.01 Interpret and follow manuals, instructions and SOP's 02.04 Prepare brief reports and checklist using standard form 03.03 Accept responsibility for own work and work area 03.05 Demonstrate safety skills 04.01 Organize own work activities 04.06 Allocate work 04.09 Prepare project/ work plans 06.02 Comply with and follow chain of command 06.01 Understand system 06.03 Identify and highlight problems	1. Communication skills 1. Conceptual skills 2. Interpersonal skills 3. Multitasking and prioritizing 4. Self-discipline 5. Teamwork 6. Learning skills 7. Leadership skills

**Tools, Equipment and Materials (TEM)**

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ITEMS	RATIO (TEM : Trainees)
<ol style="list-style-type: none"> <li>1. Digital or analog multimeter</li> <li>2. Military Testing Equipment</li> <li>3. Special tools according to related military equipment.</li> <li>4. Standard tool for electronic technician.</li> <li>5. Initial Spare Part (ISR) Digital Oscilloscope</li> <li>6. Military equipment maintenance schedule and repair orders.</li> <li>7. Standard Operating Procedures</li> <li>8. Data sheet</li> </ol>	<ol style="list-style-type: none"> <li>1 : 1</li> <li>1 : 1</li> <li>1 : 1</li> <li>1 : 1</li> <li>1 : 1</li> <li>1 : 1</li> <li>1 : 1</li> <li>1 : 1</li> </ol>

## References

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