# NATIONAL BOARD FOR TECHNICAL EDUCATION, KADUNA

NATIONAL INNOVATION DIPLOMA (NID)

IN

COMPUTER HARDWARE ENGINEERING TECHNOLOGY

**CURRICULUM AND COURSE SPECIFICATIONS** 

PLOT 'B' BIDA ROAD, P.M.B. 2239, KADUNA-NIGERIA

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#### **GENERAL INFORMATION**

### **Programme Nomenclature:**

National Innovation Diploma Programme in Computer Hardware Engineering Technology

Goal: To impart the necessary skills leading to the acquisition of skilled, enterprising and self-reliant personnel in Computer Hardware Engineering Technology.

**Objectives:** A product of National Innovation Diploma programme in Computer Hardware Engineering Technology should be able to:

- 1. Operate and maintain basic Operating Systems (DOS & Windows)
- 2. Understand the computer environment and acquire the skills needed to identify and optimize memory and computer configuration.
- 3. Start and manage computer-based businesses
- 4 Carry out routine (preventive) maintenance of Computer systems
- 5. Be able to assemble and install micro computers.
- 6. Partition and format disks and load files
- 7. Install window NT\200x in a multi-boot configuration.
- 6. Partition and format disks and load files
- 8. Install and uninstall software
- 9. Detect technical faults in a Micro Computer
- 10 Setup and troubleshoot basic Network in LAN

## **Entry Qualifications**

- i. S.S.C.E or its equivalent. Credit passes in Physics, Chemistry, Mathematics, English language and any other one from Metal works, Technical Drawing, Basic Electronics, Biology or Agricultural Science, Geography, and Further Mathematics.
- ii. The National Vocational Certificate {NVC} or National Technical Certificate {NTC} with credit passes in the trade modules and five academic subjects relevant to the programme and at least a pass in English language.

## NATIONAL CERTIFICATION

Trainees who successfully complete all the courses/modules specified in the curriculum table and pass the national examinations in the trade will be awarded the following certification:

A National Innovation/Computer Diploma in Computer Hardware Engineering.

**Note:** This programme is expected to be in form of term/session-based training courses of not less than two years for full time and three for part-time.

#### **ACCREDITATION**

- 1. The programme shall be accredited by the National Board for Technical Education before the candidates can be awarded the National Innovation Diploma in Computer Hardware Engineering Technology (NID).
- 2. Details about the process of accrediting the programme for the award of the NID can be obtained from the *Executive Secretary, National Board for Technical Education, Plot "B"*, *Bida Road, P.M.B. 2239, Kaduna*, *Nigeria*

#### **GUIDANCE NOTES FOR TEACHERS**

- 1. The new curriculum is drawn in unit courses and modules.
- 2. In designing the units, the principle of the modular system has been adopted, thus making each of the professional modules, if completed, enough to provide the student with operative skills, which can be used for employment purposes or otherwise.
- 3. Institutions may, as required, add courses to the minimum guide curriculum
- 4. The teaching of the theory and practical works should, as much as possible, be integrated. Practical exercises, especially those in professional courses and laboratory work should not be taught in isolation from the theory. For each course, there should be a balance of theory to practical works in the ratio of 30:70

#### **CURRICULUM STRUCTURE**

The curriculum of all NID programme consist of main components. These are:

- 1. General studies/education
- 2. Foundation Courses
- 3. Professional Courses
- 4. Supervised Industrial/practical work scheme.

**THE THEORY**: This aspect consists of the general studies/education, the foundation and the professional courses which shall account for a minimum of 30% of the total contact hours for the programme.

**SUPERVISED INDUSTRIAL/ PRACTICAL WORK SCHEME** are courses, which give the student the theory and practical skills needed to practice the field of calling at the technical level. The component shall account for a minimum of 70% of the total contact hours for the programme.

#### **NID Programme Duration**

- 1. Four semesters of two years full-Time.
- 2. Six semesters of three years- Part-Time
- 3. 8 hours per day or 40 hours per week
- 4. 18 weeks per semester(one week for registration and one for examination)

#### ASSESSMENT PROFILE:

#### **Practical Only**

- 1. Practical 100%
- 2. Test 10%
- 3. Examination 40%
- 4. Course work 10%

# Theory Only

1. Examination 60% 2. Course work 20% 3. Test 20%

# Theory and Practical

 1. Examination
 40%

 2. Test
 20%

 3. Course work
 20%

 4 Practical
 20%

#### CURRICULUM TABLE FOR NID IN COMPUTER HARDWARE ENGINEERING

1<sup>st</sup> SEMESTER NID Computer Hardware Engineering

S/N	Course Code	Course Title	L	Т	P	CU	СН	Prerequisite
1	CSK 501	Basis of Communication	2	-	-	2	2	
2	MAT 112	Logic and Linear Algebra	2	-	_	2	2	
3	CHT 101	Basic Electricity	2	-	2	4	4	
4	CHT 111	Operating Systems	2	-	4	6	6	
5	CHT 112	Computer Workshop and Practice 1	2		4	6	6	
6	CHT 113	Basic Electronics	2		4	6	6	
	TOTAL		12		14	26	26	

2nd Semester NID Computer Hardware Engineering

S/N	Course Code	Course Title	L	Т	P	CU	СН	Prerequisite
1	CSK 502	Communication Skills 11	2	-		2	2	
2	MAT232	Calculus	2	-		2	2	
3	EDP II1	Introduction To Entrepreneurship	2	-		2	2	
4	CHT 121	Digital Electronics	2	_	4	6	6	
5	CHT 122	System Architecture 1	2		4	6	6	
6	CHT 123	Introduction to Micro Computer and Application Packages	2		2	4	4	
	TOTAL		12		10	22	22	

**Keys:** L  $\rightarrow$  **Lecture hours** 

 $T \qquad \rightarrow \qquad Tutorials$ 

 $P \rightarrow Practical$ 

 $CU \rightarrow Course Unit$ 

 $CH \quad \rightarrow \quad Course\ Hours\ (Weight\ \&\ GPA)$ 

## **3rd Semester**

Industrial Training (3 months)

S/N	Course Code	Course Title	L	Т	P	CU	СН	Prerequisite
1 2 3 4	CHT <b>211</b> CHT <b>212</b> CHT <b>213</b> CHT <b>214</b>	PC Assembling and Upgrading System Architecture 11 Computer workshop practice 11 Basic Networking	2 2 2 2	-	4 4 4 4	6 6 6	6 6 6	
	TOTAL		8	<u> </u>	16	24	24	

# 4<sup>th</sup> Semester

S/N	Course Code	Course Title	L	Т	P	CU	СН	Prerequisite
1 2 3 4 5	CHT <b>225</b> CHT <b>221</b> CHT <b>222</b> EDP <b>223</b> CHT <b>224</b>	Consumer Electronics Troubleshooting and Repairs Software Installation and Upgrading Practice of Entrepreneurship Project	2 2 2 2	-	4 4 4 6	6 6 6 2 6	6 6 6 2 6	
	TOTAL		8		18	26	26	

NOTE: All the general courses are available in there respective programme syllabus for the IEIS.

FIRST YEAR FIRST SEMESTER

PROGRAMME: NID in Hard Ware Engineering

COURSE : Basic Electricity

CODE : CHT 101

DURATION: Hours/Week Theory: 2hrs Practical: 2hrs

UNIT : 4hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This is designed to provide the learner with working knowledge in basic electricity.

GENERAL OBJECTIVE: On completion of this course the learner should be to:

1.1 Understand Basic Electricity

1.2 Understand the uses of Multi Meter

1.3 Understand the uses of Megger Tester

1.4 Understand the uses of Basic Electricity kits

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)

COURSE: Basic Electricity COURSE CODE: CHT 101 CONTACT HOURS: 84

GOAL: This course is designed to provide the learner with working knowledge basic electricity

COURSE SPECIFICATION: Theoretical Contents: Practical Contents

**GENERAL OBJECTIVE 1:** UNDERSTAND BASIC ELECTRICITY

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
4-6	1.1 Define basic electricity 1.2 Outline the characteristics of basic electricity. 1.3 Define Ohm's law. 1.4 Describe the impact of basic electricity to:         (a) current flow         (b) voltage and         (c) resistance 1.5 Define simple D.C circuits 1.6 State various types of energy and their interrelationship 1.7 Define the concept of magnetism and magnetic circuits 1.8 Define the concept of electromagnetism and electromagnetism and electromagnetic induction 1.9 Define the concept of inductance, capacitance. Resistance and their applications. 1.10 State the fundamentals	Explain basic electricity Explain the characteristics of basic electricity Describe Ohm's law Describe the impact of basic electricity to: (a) current flow (b) voltage and (c) resistance Explain simple D.C circuits State various types of energy and their inter-relationship Explain the concept of magnetism and magnetic circuits Explain the concept of electromagnetism	Chalkboard Magnetic Board, charts,	1.1 Identify various voltages as it applies to the above. Namely: (a) single, & (b) three phase.  1.3 Use basic electricity kits to setup simple circuits, to determine current f low, voltage, flow voltage, etc.  1.4 Identify the sources of current flow of electricity with voltage and resistance.	Explain various voltages e.g. single, three phases.  Demonstrate the use of simple electric circuits to determine current flow, voltage, etc.  Show the sources of current flow of electricity.	Chalkboard ,Magnetic Board, Charts.

	1.11 it	Define Kirchoffs law and examine some circuits as relates to Kirchoff's law.	electromagnetic induction Explain the concept of inductance, capacitance resistance and their applications. State the fundamentals of A.C theory. Define Krichoff's law and examine some circuits as it relates to Kirchoff's law.					
GENER	AL OF	BJECTIVE 2: UNDERSTA	 AND THE USES OF M	 11				
7-8	2.1	Define a multi-meter.	Explain multi-	Text Books,	2.1	Identify a multi-	Demonstrate the	
			meter.	Diagrams,		meter	use of a multi-	Text Books,
	2.2	State the uses of a multi-meter.	Explain the use of multi-meter.	Charts, white Board and markers	2.2	Use a multi- meter to determine:	meter. Identify a multi- meter	Diagrams, Charts, white Board and
	2.3	State the colour codes.	Explain the colour codes.		of of	<ul><li>(a) the reading various types of diode</li><li>(b) the reading various types of resistors</li></ul>	Use a multi-meter to determine: (a) the reading of various types of diode (b) the reading of	markers

	1	11B in Computer 11	araware Brigine	ering rechnology (Draji)		
					various types of resistors	
GENER	AL OBJECTIVE 3: UNDERSTAI	ND THE USES OF ME	EGGER TESTER			
9-10	<ul><li>3.1 Define a megger-tester</li><li>3.2 Sate the uses of megger meter</li></ul>		Text Books, Diagrams, Charts, white Board and markers	Use transformers to determine how voltage is generated at the secondary windings.		
GENER	AL OBJECTIVE 4: UNDERSTAI	ND THE USES OF B	ASIC ELECTRICIT	Y KIT		
11-13	<ul> <li>4.1 State the uses of basic electricity kit.</li> <li>4.2 Describe simple D.C circuits.</li> <li>4.3 Define R-C oscillator</li> </ul>	Explain basic electricity kits.  Explain simple D.C circuits.  Explain R-C oscillator	Text Books, Diagrams, Charts, white Board and markers	Use basic electricity kits to determine the impedance [z] of capacitive, inductive and resistive loads of simple circuits.  Use basic electricity kits to setup simple Network, to determine the current flows applying kirchoff's law.	Demonstrate using basic electricity kits to determine the impedance [z] of capacitive, inductive and resistive loads of simple circuits.  Demonstrate using basic electricity kits, setup simple  Network, to determine the current flows applying kirchoff's law.	Text Books, Diagrams, Charts, white Board and markers
14	REVISION				iaw.	

PROGRAMME: NID in Hard Ware Engineering

COURSE : Introduction to Operating System.

CODE : CHT 111

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT: 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This is designed to provide the learner with working knowledge of Operating System.

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

1.1 Understand Operating System

1.2 Understand UNIX Operating System

1.3 Understand the Linux Operating System

1.4 Understand the Windows Operating System

PROGR	PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)											
COURS	E: IN	TRODUCTION TO OPER				CONTACT HOURS:	84					
		STEM										
GOAL:												
COURS	COURSE SPECIFICATION: Theoretical Contents: Practical Contents											
CENED	CENERAL ORIECTIVE. LINDERCTAND THE CONCERTS AND ENGINEERING OF COANNERS											
GENER	GENERAL OBJECTIVE: UNDERSTAND THE CONCEPTS AND ENGINEERING OF SCANNERS.  SPECIFIC LEARNING TEACHERS LEARNING SPECIFIC LEARNING TEACHERS LEARNING											
WEEK	3	OBJECTIVE	TEACHERS	LEARNING	SPECIFIC LEARNI		LEARNING					
			ACTIVITIES	RESOURCES	OBJECTIVE	ACTIVITIES	RESOURCES					
			AND OPERATING SYS									
1-3	1.1	Define Operating	Explain an	Chalkboard,								
		System (O/S)	Operating (O/S)	chart magnetic								
	1.2	List the functions of O/S	System (O/S)	board								
	1.2	List the functions of 0/3	Give examples of									
	1.3	Describe sequential	O/S									
	1.5	processes	0/5									
		P	Explain the features									
	1.4	Define concurrent	of O/S									
		processes										
			Explain sequential									
	1.5	Describe processor	Processes									
		management										
			Explain concurrent									
			processes									
			Explain processor									
			management									
GENER	AL OE	BJECTIVE 2: UNDERSTA	ND UNIX OPERATING	G SYSTEM	1		<u>'</u>					
4-6	2.1	Define UNIX O/S	Explain UNIX O/S.		-Install UNIX O/S	Demonstrate the						
	2.2	State the Features of	Outline the		-Investigate Basic UN	NIX Installation of						

	1	*	aware Engineering Technology (D	0 /
	UNIX O/S	features of UNIX	commands	UNIX O/S
	2.3 Describe the processes	O/S.	-Create UNIX user	Show the basic
	of installing UNIX O/S	Explain the	account	UNIX commands
		processes of		Open UNIX user
		installing UNIX		account.
		O/S.		
		,		
GENER	AL OBJECTIVE 3: UNDERSTAI	ND LINUX OPERATIN	SYSTEM	,
7-8	3.1 Define Linux o/s.	Explain Linux o/s	-Install Linux o/s	-Demonstrate the
	3.2 State the Features of Linux	Outline the	-itemize the Featur	es of Installation of
	o/s.	Features of Linux	Linux o/s.	Linux
	3.3 Describe the processes of	o/s	-Apply the processe	
	installing Linux o/s.	Explain the	Installing Linux o/s	
	mistaning Emax 6/5.	processes of	instanting Emax 0/3	Features of
		installing Linux		Linux o/s.
		_		-Show the
		o/s.		
				processes of
				Installing Linux
				o/s.
		ND WINDOWS OPERA		
9-10	4.1Describe the features of	-Explain the	Install operating syst	
	Windows 200x (Multi-tasking,	features of		Installation of
	Multiprocessing, Security,	Windows 200x	Customize Operating	operating system.
	Protocols, Supported file system,	(Multi-tasking,	System to suit the	
	Domain and Workgroup.	Multiprocessing,	environment.	Customize
		Security, Protocols,		Operating System to
		Supported file	Run the O.S. at optin	nal suit the
	4.2 Describe Windows 200x	system, Domain	level considering on	board environment.
	versions	and Workgroup.	resources.	
	(a) Compare and Contrast	•		Run the O.S. at
	(Windows 200		Use the operating sys	stem optimal level
	Professional, Windows	-Explain Windows	effectively.	considering on
	200 Server, Windows 200	200x versions		board resources.
ĺ	Advances Servers, and	(b) Compare		

			iraware Brigineer	ing Technology (Draji)	T	1
	Windows 200 Data centre	and			Use the operating	
	Server).	Contrast			system effectively.	
		(Windows				
11-12		200				
	4.3 Describe Microsoft	Professional				
	Management Console	, Windows				
		200 Server,				
	4.4Define the Control Panel	Windows				
	(a) Change system settings	200				
	(b) Add/Remove Hardware	Advances				
	(c) Add/Remove Software	Servers, and				
	(d) Display property	Windows				
		200 Data				
		centre				
		Server).				
	4.5Describe Windows 200 disk					
	and storage management					
	(a) Basic and dynamic	-Explain Microsoft				
	storage	Management				
	(b) Managing disks and	Console				
	volumes					
	(c) Compressing Files and	-Define the Control				
	Folders	Panel				
	(d) Encryption (Files and	(e) Change				
	Folders)	system				
		settings				
		(f) Add/Remov				
		e Hardware				
	4.6Describe managing Users and	(g) Add/Remov				
	Groups	e Software				
	(a) User Accounts in	(h) Display				
	Windows 200	property				
	(b) Creating, deleting,					
	modifying user accounts	Explain Windows				
	(c) Implementing Groups	200 disk and				

storage management (e) Basic and dynamic storage [F] .Managing disks	
(e) Basic and dynamic storage	
dynamic storage	
storage	
[F] .Managing disks	
and volumes.	
[g] Compressing	
Files and Folders	
[h] Encryption	
(Files and Folders)	
[i] Differentiate	
managing Users	
and Groups	
User Accounts in	
Windows 200	
Creating, deleting,	
modifying user	
account	
GENERAL OBJECTIVE 5: KNOW THE COMPONENTS OF OPERATING SYSTEMS	
13 5.1 Define o/s nucleus{kernel} Explain o/s	
5.2 Describe the components of   nucleus{kernel}	
o/s nucleus: Bios dispatcher, Explain and Itemize	
Basic I/0 system 1/0 system the components of	
dispatcher etc. o/s nucleus: Bios	
dispatcher, Basic	
I/0 system 1/0	
system dispatcher	
14 REVISION etc.	

PROGRAMME: NID in Hard Ware Engineering

COURSE : Computer Workshop Practice 1.

CODE : CHT 112

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT : 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This is designed to enable the trainee maintain Computer System and Accessories

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1.1 Know the various precautions against accidents while in the repair laboratory, and carryout first aid in case of accident
- 1.2 Understand the optimal usage of Computer System and Accessories.
- 1.3 Maintain and repair computer system and its related accessories

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)								
COURSE: COMPL	COURSE: COMPUTER WORKSHOP PRACTICE I COURSE CODE: CHT 112 CONTACT HOURS: 84							
GOAL: This course is designed to enable the trainee maintain Computer and Accessories.								
<b>COURSE SPECIFI</b>	COURSE SPECIFICATION: Theoretical Contents: Practical Contents							

# GENERAL OBJECTIVE 1: Know the various precautions against accidents while in the Repair lab, and Carryout First Aid in case of accident.

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-4				<ul> <li>1.1: Identify the various tools and equipment in the Computer Repair lab.</li> <li>1.2: Use various tools and equipment in the Computer Repair lab.</li> <li>1.3: Operate the tools and equipment in the Computer Repair lab properly.</li> <li>1.4: Operate safety gadgets and procedure for a Computer Workshop.</li> <li>1.5: Use the concept of First Aid Box correctly.</li> </ul>	Demonstrate each activity of the Specific Learning Objectives.	Computer Systems, Blowers, IC extractor, set of screw drivers, soldering iron, lead sucker, multi-meter, micro computers, Installation, disks to include Anti virus, scraps of CPU, Mother board, Hard drive, memory, RAM, CD ROM Drive, floppy disk drive, First Aid box.

GENERAL OBJECTIVE 2: Understand the optimal Usage of Computer System and Computer Accessories.					
5-7	<del>-</del>	nputer			
	Computer System activity of the Sys	tems, set			
	and accessories Specific Learning of s	crew			
	correctly. Objectives. driv	ers,			
	2.2: Power the System Inst	tallation,			
		ks to			
		ude Anti			
	maintenance tasks viru	s, First Aid			
	on the computer box				
	system [run anti-				
	virus program]				
	er System and its related accessories.				
8-12	, , , , , , , , , , , , , , , , , , ,	wers, IC			
		ractor, set			
		crew			
		ers,			
		dering iron,			
	, , , , , , , , , , , , , , , , , , ,	d sucker,			
		timeter,			
	3.3 Use available tools indicated in the mic				
		nputers,			
		tallation,			
	5,555,	s to			
		ude Anti			
		is, scraps			
		CPU,			
		ther board,			
		d drive,			
		mory,			
		M, CD ROM			
	·	e, floppy			
13	3.5 Apply the concept of disk	c drive,			

			I	T I
		Colour codes of		First Aid box.
		resistors and		
		capacitors.		
		3.6 Apply the concept of		
		multi meters.		
		3.7 Apply simple tests		
		on basic electronic		
		components [fuse,		
		switches, wire,		
		bulb, batteries,		
		short circuits]		
		Short circuits]		
1.4				
14				

PROGRAMME: NID in Hard Ware Engineering

COURSE : Basic Electronics

CODE: CHT 113

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT: 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This is designed to enable the trainee have a working knowledge of Basic Electronics

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

1.1 Understand the concept of basic electronics.

1.2 Understand diodes technology

1.3 Understand power supplies concept { half wave and full wave}

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)

COURSE: BASIC ELECTRONICS COURSE CODE: CHT 113 CONTACT HOURS: 84

**GOAL:** This course is designed to provide the learner with working knowledge OF Basic Electronics

COURSE SPECIFICATION: Theoretical Contents: Practical Contents

# **GENERAL OBJECTIVES 1.1 Understand the concept of basic electronics**

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-4	1.1Describe the fabrication of semi-conductor.  1.2 Describe Diodes technology(P-Type, N-Type, PN-junction, minority carriers, majority carriers, junction voltage).  1.3Define Diode bias (forward-and reverse-bias, PIV voltage) 1.4 Identify the circuit symbols for diode Physically identify various types of diodes 1.5-Describe the energy levels in materials 1-6 Differentiate between conductors, semiconductors and insulators, using Fermilevel concept. 1-7 Define Fermi energy levels	Explain the fabrication of semi-conductor.  Explain Diodes technology(P-Type, N-Type, PN-junction, minority carriers, majority carriers, junction voltage).  Explain Diode bias (forward- and reverse-bias, PIV voltage)  Itemize the circuit symbols for diode Physically identify various types of diodes Explain the energy levels in	Chalkboard or magnetic board, textbooks	1.1 Demonstrate Diode bias (forward- and reverse-bias, PIV voltage) 1.2 Identify the circuit symbols for diode Physically identify various types of diodes 1.3-Show the energy levels in materials 1-4 Classify between conductors, semiconductors and insulators, using Fermi-level concept.	Itemize the circuit symbols for diode. Physically identify various types of diodes. Identify the energy levels in Materials. Differentiate between conductors, semiconductors and insulators, using Fermi-level concept. Identify Fermi energy levels State valence and conduction bands	Chalkboard or magnetic board, textbooks.

	1.8 Describe valence and conduction bands	materials Differentiate between conductors, semiconductors and insulators, using Fermi-level	J		
		concept. Explain Fermi			
		energy levels			
		Explain valence			
		and conduction			
		bands			
GENE	RAL OBJECTIVES: Understand	diodes technology	<b>/</b> :		
5-7	2.1 Describe P-N	- Explain P-N		2.1 Identify P-N	-Outline P-N
3 /	unction diode	junction diode		junction diode	junction diode
	2.2 Sketch forward	- Sketch forward		2.2 Sketch forward	-Sketch forward
	and reverse	and reverse		and reverse	and reverse
	characteristics of	characteristics of		characteristics of	characteristics of
	the P-N junction	the P-N junction		the P-N junction	the P-N junction
	diode	diode		diode	diode
	2.3 Outline silicon and	- Outline silicon		2.3 Outline silicon and	- Outline silicon
	Germanium diode	and Germanium		Germanium diode	and Germanium
	characteristics	diode		characteristics	diode
	2.4 Define zener	characteristics		2.4 Define zener	characteristics
	diode	- Explain zener		diode	- Explain zener
	2.5 Identify the circuit	diode		2.5 Identify the circuit	diode
	symbols for diode	-Identify the		symbols for diode	- Identify the
	2.6 Physically identify	circuit symbols		2.6 Physically identify	circuit symbols
	various types of	for		various types of	for
	diodes	diode		diodes	diode
	2.7 Describe the	- identify		2.7 Identify the	- identify

various types of
diodes
- Identify the
operations of:
I Tunnel diode
Ii Photo diode
Iii Therm tors

		relay and output drivers).		
14	REVISION			

#### ASSESSMENT PROFILE ON THEORY

- 1. Examination 60%
- 2. Course work 20%
- 3. Test 20%

PROGRAMME: NID in Hard Ware Engineering

COURSE : Digital Electronics

CODE : CHT 113

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT: 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This is designed to enable the trainee have a working knowledge of Digital Electronics

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1. Understand the phenomenon of wave optics.
- 2. Understand Related concepts of Convolution.
- 3. Know the Concepts of Digital Systems and the concepts of Data / Information in Digital Systems.
- 4. Know the structure and Development of Digital Systems.

First Year

2nd Semester NID Computer Hardware Engineering

PROGRAMM	E: NATIONAL INNOVATIO	N DIPLOMA IN COMPUTER HARDWAR	E ENGINEERING TECHNOLOGY (NID)
COURSE:	DIGITAL ELECTRONICS	COURSE CODE: CHT 121	CONTACT HOURS: 84

GOAL: This course is designed to introduce the learner to the concepts, and Building of Digital Electronics.

COURSE SPECIFICATION: Theoretical Contents: Practical Contents

**GENERAL OBJECTIVE: Understand the Phenomenon of Wave Optics** 

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-4	1.1: Define the term waves.	-Explain the term	Text books,			
		waves.	White Board,			
	1.2: Differentiate between	-Classify waves	Marker.			
	mechanical wave and	into mechanical				
	electromagnetic waves.	and				
		electromagnetic				
		waves.				
	1.3: Distinguish between the	-Distinguish				
	two types of waves:	between the two				
	Longitudinal and	types of waves:				
	transverse waves.	Longitudinal and				
		Transverse				
		waves.				
	1.4: List examples of wave.	-List examples of				
		Wave				
	1.5: Define wave parameters;	-Define wave				
	e.g. frequency,	Parameters; e.g.				
<u> </u>	wavelength, wave	frequency,				

			Taware Engineer	ing Technology (Druji)		
	velocity, amplitude.	wavelength, wave				
		velocity,				
		amplitude				
GENER	AL OBJECTIVE: Understand	d Related concepts	of Convolution.			
5-7	2.1: Describe signals by	: Explain signals				
	impulse functions.	by impulse				
	·	functions.				
	2.2: Describe Impulse and	Explain Impulse				
	step response of linear	and step				
	systems.	response of linear				
		systems.				
	2.3: Describe Discrete-time	Explain Discrete-				
	Convolution.	time Convolution.				
	2.4: identify other aspects of	Explain other				
	convolution.	aspects of				
		convolution.				
GENER	AL OBJECTIVE: Know the C	<b>Concepts of Digital</b>	Systems and th	e concepts of Data / Inf	ormation in Digital	Systems.
8-11	3.1: Define Discrete Signals	-Explain Discrete	Text books,			
	and Systems.	Signals and	White Board,			
	-	Systems.	Marker.			
	3.2: identify the different	Explain the				
	codes used in digital	different codes				
	system.	used in digital				
	3,555	system.				
	3.3: Describe basic digital	Explain basic				
	functions.	digital functions.				
	1 3 2 3. 2	Explain the				
	3.4: Describe the concept of	concept of data /				
	data / Information	Information				
	-					
		•				
	presentation in digital system.	presentation in digital system.				

-13	AL OBJECTIVE: Know the st 4.1: Describe the various	ructure and practices o Explain the	4.6: Identify various	Demonstrate each	Oscilloscope [all
	methods of minimization	various methods	types of transistors,	activity of the	categories], basic
	required to simplify digital	of minimization	FET, Bi-Polar	Specific Learning	electronic board
	combinational circuits.	required to	junction.	Objectives.	of various types,
		simplify digital	4.7: Demonstrate the		multimeter,
		combinational	concept of signals /	Supervise the	electronic
		circuits .	waves.	learner to achieve	components
	4.2: Identify the various types	Explain various	4.8: Demonstrate Signal	the specific	[power supplies,
	of transistors, Field Effect	types of	Sampling and	objectives.	photocells,
	Transistors [FET], Bi-Polar	transistors, Field	Reconstitution.		photodiodes,
	junction.	Effect Transistors	4.9: demonstrate Signal		LED, e.t.c]
		[FET], Bi-Polar	truncation and		
		junction.	windowing.		
	4.3: Describe the families of	Describe the	4.10: Demonstrate		
	Transistor Logic Gates	families of	Digital Filters.		
	[TTL].	Transistor Logic	3.11: Build a project,		
		Gates [TTL].	using some of the		
	4.4: Describe Cascading for	Describe	logic gates.		
	transistors.	Cascading for			
	455 " 5	transistors.			
	4.5: Describe Fan in and out.	Describe Fan in			
		and out.			

PROGRAMME: NID in Hard Ware Engineering

COURSE : System Architecture.

CODE : CHT 122

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT : 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This course intends to provide the learner with the structural and functional features of the computer system and its

components

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

1. Understand Numbering System.

- 2. Know the Internal Structure of Computer Processing Unit.
- 3. Understand the basic principles of Microelectronics and Optoelectronics.
- 4. Understand the concept and development of Simple programs for a Microprocessor

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)

COURSE: SYSTEM ARCHITECTURE I COURSE CODE: CHT 122 CONTACT HOURS: 84

**GOAL:** This course intends to provide the learner with the Structural and Functional Features of the Computer

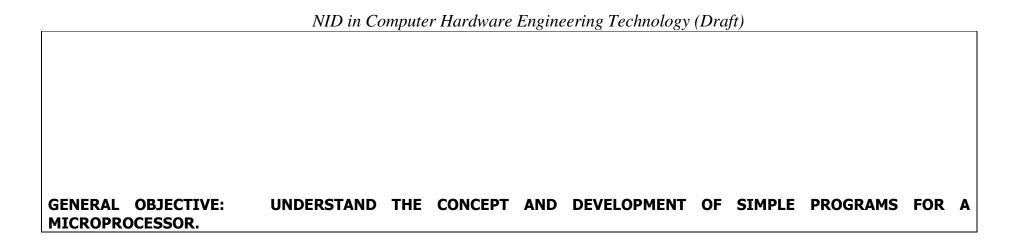
**System and Components.** 

COURSE SPECIFICATION: Theoretical Contents: Practical Contents

WEE K	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-4	1.1: Define Number System.	-Explain				
		Number System.				
	1.2: Describe the various	-Explain the				
	types of number	various types of				
	systems.	number systems.				
	1.3: Define Binary System.	-Explain Binary				
		System.				
	1.4: Solve problems on	-Solve problems				
	Binary System	on Binary				
	[Addition, Subtraction,	System				
	Multiplication, and	[Addition,				
	subtraction].	Subtraction,				
		Multiplication,				
		and				
		Subtraction].				
	1.5: Convert numbers from	Convert numbers				
	other base to binary.	from other base				
	·	to binary.				
	1.6: Convert numbers from	Convert numbers				
	binary to other base.	from binary to				

		•	Ingi	receiving recinionogy (Br	-g·/	
	1.7: Describe Binary Comparators.	other base. Convert alphabets / words to binary. Explain Binary Comparators.				
	1.8: Describe the concept of Error Detection.	Describe the concept of Error Detection.				
GENE	RAL OBJECTIVE: KNOW TH	HE INTERNAL STR	<b>RUCTURE OF CO</b>	MPUTER PROCESSING	UNIT.	
5-7	<ul> <li>2.1: Define the Central Processing Unit.</li> <li>2.2:Outline the functions of the C P U components [Motherboard, Processor, RAM Memory, Disk Drives, Power Pack, Cables, Slots: Peripheral Component Interconnect [PCI], International Standard Architecture [ISA].</li> </ul>	: Explain the Central Processing Unit. Explain functions of components of the C. P. U. [Motherboard, Processor, RAM Memory, Disk Drives, Power Pack, Cables, Slots: Peripheral Component Interconnect [PCI], International Standard Architecture [ISA].		<ul><li>2.7: Identify components of the Central Processing Unit.</li><li>2.8: Set jumpers to tune accurately.</li></ul>	Demonstrate each activity of the Specific Learning Objectives.	

		THE IN COMPLICE	Haraware Bugi	neering Technology (Di	cij i )	
	2.3: Describe the concept of	Explain the				
	Jumpers and Caps.	concept of				
		Jumpers and				
		Caps.				
	2.4: Describe Memory	Explain Memory				
	Circuits.	Circuits.				
	2.5: Identify the types of	Explain the types				
	signals within the C. P.	of signals within				
	U. [Electrical and	the C. P. U.				
	interface].	[Electrical and				
		interface].				
	2.6:Describe the flow of	Explain the flow				
	signals with the C. P. U.	of signals with				
		the C. P. U.				
GENER	RAL OBJECTIVE: UNDERSTA	AND THE BASIC P	RINCIPLES OF	MICROELECTRONICS.		
8-11	3.1: Describe	Introduce with		3.6: Demonstrate the	Demonstrate	Electronic
	Microelectronics.	clear and		Concept of	each activity of	Boards,
	3.2: Describe Integrated	detailed		Microelectronics.	the Specific	Integrated
	Circuit.	explanations		3.7: Demonstrate the	Learning	Circuits,
	3.3: Describe the concept of	each of the		concept of	Objectives.	Computer
	Wafer.	concepts in the		Optoelectronics.		motherboards
	3.4: State the Concept of	specific learning				[all mentioned
	Tantalum.	objective.				categories],
	3.5: Identify types of					multi-meter.
	Integrated Circuits.					
	3.6: Describe the concept of					
	8/16/32 bits Computer					
	architecture.					



12.12	4 1. Define Mi			AC. Idantif.	1	Miguagus
12-13	4.1: Define Microprocessor.	Introduce with		4.6: Identify a	Demonstrate	Microprocessor
		clear and		Microprocessor.	each activity of	Teaching Aid.
	4.2: List examples of	detailed		4.7: Identify various	the Specific	
	Microprocessors [386,	explanations		types of	Learning	
	486, Pentium I to IV].	each of the		microprocessor.	Objectives.	
		concepts in the		4.8: Install and		
	4.1: Define Program.	specific learning		Uninstall		
		objective.		Microprocessors		
	4.2 Identify types of			on the		
	programming			Motherboard.		
	languages.			4.9 Develop a Simple		
				Program for a		
	4.3: Define Language			microprocessor.		
	Translator.					
	4.4: Describe the various					
	types translator					
	[Assembler and					
	Compiler].					
	4.5: Outline the steps					
	involved in developing a					
	program.					
	4.6Describe Internal Working					
	of the Microprocessor as					
	it relates to:					
	a. Fetching					
	Instructions.					
	b. Moving					
	Instructions					
	between					
	registers.					
14	R E V I	S I O	N			

PROGRAMME: NID in Hard Ware Engineering

COURSE : Introduction To Micro-Computer and Application Packages

CODE : CHT 123

DURATION: Hours/Week Theory: 2hrs Practical: 2hrs

UNIT: 4hrs TOTAL CONTACT HRS: 56

GOAL : This course is designed to provide the learner with working knowledge of Microsoft Software

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

1.Understand various features of a micro computer

2.Understand and create /edit documents using MS-WORD

3. Understand and create/edit documents using MS-EXCEL

4. Understand and create/edit documents using MS-ACCESS

5. Understand and create/edit documents using MS-POWERPOINT

6.Understand and create/edit documents using S.P.S.S

PROGR	PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)							
	E: INTRODUCTION TO MICRO TER AND APPLICATION PACK	KAGES			NTACT HOURS:	56		
GOAL:	This course is designed t				mputer and Applicat	tion packages		
COURS	E SPECIFICATION: Theoretica	al Contents:	Practical (	Contents				
WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES		
GENERA	AL OBJECTIVE: Understand var	rious features of a mi	icro-computer					
1-2	<ul> <li>1.1 Describe the basic 1/0 device on a personal computer</li> <li>1.2 Describe folders and file management</li> <li>1.5 identify personal computer peripherals e.g. scanners, printers speakers etc.</li> </ul>	-Explain the basic 1/0 device on a personal computer -Explain the process of booting a personal computer -Customize the p.c desktop Create folders -Describe folders and file management -itemize personal computer	Charts, chalkboard, computer printer scanner, ups.	1.1 Demonstrate the process of booting personal computer 1.2 Customize the p.c desktop 1.3 Create folders	Explain the basic 1/0 device on a personal computer -Explain the process of booting a personal computer -Customize the p.c desktop Create folders -Describe folders and file management -itemize personal computer	Charts, chalkboard, printer scanner, ups. Micro Computer Laboratory with running Micro-soft office packages; CorelDraw, & Statistical package (SPSS)  Internet Connectivity		

		•	*		ing Technology (Drujt)		
			peripherals e.g.			peripherals e.g.	
			scanners, printers			scanners, printers	
			speakers etc.			speakers etc.	
GENER	AL OBJEC	TIVE: Understand a	nd create/edit doc	uments using MS	S-WORD		
3-4	2.1Descr	ibe ms-word as word	Explain ms-word		Demonstrate how to	Explain ms-word	
		cessing software	as word		start-ms word from	as word	
	2.2 Demo	onstrate how to start-	processing		start-up button	processing	
	ms \	word from start-up	software		Create an ms word	software	
	butt	on	Explain how to		document	Explain how to	
	2.3 Desc	ribe the tool bar in an	start-ms word		Modify/format the	start-ms word	
	ms-\	word environment	from start-up		document	from start-up	
	2.4 Creat	tion of an ms word	button		Save ms-word document	button	
	docu	ument	Explain the tool		on hard disk/floppy disk	Explain the tool	
	2.5 Desc	ribe the process of	bar in an ms-word		-print the document	bar in an ms-word	
	docu	ument	environment			environment	
	Mod	lificationy/formating	Creation of an ms			Creation of an ms	
	2.6 Desc	ribe how to save ms-	word document			word document	
	word	d document on hard	Modify/format the			Modify/format the	
	disk	/floppy disk	document			document	
	2.7 Desc	ribe the process of	Save ms-word			Save ms-word	
	print	ting a document.	document on hard			document on hard	
		_	disk/floppy disk			disk/floppy disk	
			print the			print the	
			document			document	
GENER	AL OBJEC	TIVE: Understand ar	nd create/edit doci	ument in MS-Exc	cel		
<b>5-6</b>			•				
	3.1	Describe ms-excel	Explain ms-excel		Identify the features of	Explain ms-excel	
		as a spreadsheet	as a spreadsheet		tool bar/formular bar etc	as a spreadsheet	
		package	package		Create document in ms-	package	
		-	Show how to start		excel	Show how to start	
	3.2	Describe how to	ms-excel from		Perform simple	ms-excel from	
		start ms-excel from	start-up button		additions/multiplications	start-up button	
		start-up button	Identify the		Prepare the document	Identify the	
		start-up button	Identify the		Prepare the document	Identify the	

				Haware Bugineer	ing Technology (Draji)	
	3.3	Identify the features	features of tool		as print area document	features of tool
		of tool bar/formulae	bar/formula bar		Save the document on	bar/formula bar
		bar etc	etc		hard disk/floppy/flash	etc
	3.4	Explain how to	Create document		disk	Create document
		create document in	in ms-excel		Print the document	in ms-excel
		ms-excel	Perform simple			Perform simple
	3.5	Explain how perform	additions/multiplic			additions/multiplic
		simple	ations			ations
		additions/multiplicati	Prepare the			Prepare the
		ons	document as print			document as print
	3.6	Describe how to	area document			area document
		prepare the	Save the			Save the
		document as print	document on hard			document on hard
		area document	disk/floppy/flash			disk/floppy/flash
	3.7	Explain how to save	disk			disk
		the document on	Print the			Print the
		hard	document			document
		disk/floppy/flash disk				
	3.8	Explain how to print				
		a document				
		CTIVE: Understand and	create document us	ing Ms-Access		
8-9 4.1	Describe I	MS-Access as a	-Explain MS-	4.1Create an	4.1Create an MS-Access	document
	database	application software.	Access as a	MS-Access	4.2 Modify/format the do	
			database			e MS-Access on hard disk/floppy/flash
			application	document	disk	
4.2		to start MS	software.	4.2	4.4 Access as a database	
	Access fr	om start-up button	-Demonstrate to	Modify/format		Access from start-up button
			start MS Access	the document	II	an MS-Access environment
			from start-up	4.3 Show how	-Create an MS-Access do	
4.	•	the tool bar in an MS-	button	to save the MS-	- Modify/format the docu	
	Access er	nvironment	- identify the tool	Access on hard		MS-Access on hard disk/floppy/flash disk
			bar in an MS-	disk/floppy/flash	- Print the document	
			Access	disk		

environment -Create an MS- Access document - Modify/format the document - Show how to save the MS- Access on hard	
Access document - Modify/format the document - Show how to save the MS-	
- Modify/format the document - Show how to save the MS-	
the document - Show how to save the MS-	
- Show how to save the MS-	
save the MS-	
Accord on hard	
ACCESS OII IIdiu	
disk/floppy/flash	
disk	
- Print the	
document	
GENERAL OBJECTIVE: Understand and create document using MS-PowerPoint	
10-11 5.1 Describe MS-power point -Explain MS- 5.2 Create	
as a presentation package power point as slides. Edit the	
a presentation slides to select	
package the	
various back	
numbers/appear	
ances	
5.3 Show the	
slides so created	
GENERAL OBJECTIVE: Understand and create /edit document in statistical package	
Explain SPSS 6.1 Describe 1Explain SPSS as	
as one of the SPSS as one of one of the	
statistical the statistical statistical	
packages packages packages	
Demonstrate Demonstrate Demonstrate	
how to start how to start spss	
spss spss Demonstrate	
Demonstrate Demonstrate how to input data	

how to input	how to input	into the spss
data	data into the	document
into the spss	spss document	Describe the
document	Describe the	various
Describe the	Various	approximation/
various	approximation/	estimation
approximation/	stimation	available
estimation	available	-Solve some statistical problems using spss
available		
-Solve some	6.5 Solve some	
statistical	statistical	
problems using	problems using	
spss	spss	
	REVISION	

PROGRAMME: NID in Hard Ware Engineering

COURSE : PC Assembling and Upgrading.

CODE : CHT 211

DURATION: Hours/Week Theory: 2hrs Practical: 2hrs

UNIT : 4hrs

**TOTAL CONTACT HRS: 56** 

GOAL : This course is designed to provide the learner with working of Computer System Assembling, Installation and

Upgrading.

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

1. Know the Compatibility Variance among Computer components.

- 2. Know the Coupling / assembling procedures of Computer Processing Unit.
- 3. Understand the Hardware Configurations involved in the assembling of the Processing Unit.
- 4. Understand the Software Configuration involved in the assembling of the Processing Unit.
- 5. Know The Activities Involved In Upgrading A Computer.
- 6. Install a personal computer for use.

### Second Year First Semester

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)

COURSE: PC ASSEMBLING AND UPGRADING. COURSE CODE: CHT 211 CONTACT HOURS: 84

**GOAL:** This course is designed to provide the learner with working knowledge of Personal Computer Assembling,

**Installation and Upgrading.** 

COURSE SPECIFICATION: Theoretical Contents: Practical Contents

#### 1 GENERAL OBJECTIVE: KNOW THE COMPATIBILITY VARIANCE AMONG COMPUTER COMPONENTS.

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-3	1.1: Define Motherboard.	Introduce with	Text books,	1.8: Identify the various	Demonstrate each	Set of screw
		clear and detailed	White Board,	available	activity of the	drivers, scraps of
	1.2: Define RAM memory.	explanations each	Marker.	motherboards in the	Specific Learning	CPU, Mother
		of the concepts in	computer	computer market.	Objectives.	boards, Hard
	1.3: Describe SIMMs.	the specific	accessories	1.9: Identify the various		drives, memory,
		learning objective.		RAM memory		RAM [SIMMs and
	1.4: Describe DIMMs.			[SIMMs, DIMMs].		DIMMs], CD ROM
				1.10:Identify various		Drives, floppy
	1.5: Define Processor.			types of SIMMs as it		disk drives.
				relates to		
	1.6: Outline types of			manufacturers.		
	Processors.			1.11: Identify various		
	1.7 Describe the appropriate			types of DIMMs as		
	disk Jumper settings			it relates to		
	suitable for various			manufactures.		
	motherboards [Master,			1.12: Identify various		

	Cable Select, Slave]		types of Processors.	
2 GENI	LERAL OBJECTIVE: KNOW TH	LIE COUPLING / AS	SEMBLING PROCEDURES OF COMPUTER PROCESSI	NG UNIT.
4-5	<ul> <li>2.1: Define Computer Casings.</li> <li>2.2: Define Clock speed.</li> <li>2.3: Define IDE and FDD cables.</li> <li>2.4 Explain and Identify a corresponding casing to suit the motherboard</li> </ul>	Explain Computer Casings Explain Clock speed.  Explain IDE and FDD cables.	2.4: Select an appropriate Motherboard, and know the clock speed.  2.5 Place motherboard correctly inside the casing and screw. 2.6 Mount Processor, Memory and other Onboard components appropriately. 2.7 Fix disks to the casing and fasten. 2.8 Connect IDE, FDD cables accordingly. 2.9 Set disks' jumper settings appropriately. 2.10 Connect Power Cables within the C.P.U.	e Casings,
3 GENI 6-7		AND THE HARDWA R PROCESSING U	RE CONFIGURATIONS INVOLVED IN THE ASSEMBLE NIT.	ING OF THE
2 2			3.1: Set jumpers Demonstrate onboard activity of the appropriately. Specific Lear 3.2: Set disks' jumpers Objectives.	e Disks, Jumper

		12 in computer 11th		0, 0,	ı	1
				appropriately.		
				3.3: Place cards		
				accurately on the		
				respective slots		
				[ISA to ISA; PCI to		
				PCI].		
				3.4: Connect Switch		
				cables correctly.		
				3.5: Connect LED cable		
				correctly,		
				3.6: Connect Inbuilt		
				Speaker cable		
				correctly.		
				•		
				3.7: Connect Turbo		
				cable correctly.		
				3.8: Connect Reset cable		
				correctly.		
	RAL OBJECTIVE: UNDERSTAND		NFIGURATION IN			
<b>4 GENE</b> 8-9	4.1: Describe BIOS / CMOS	Introduce with	NFIGURATION IN	4.2: Connect the entire	Demonstrate each	Working Personal
		Introduce with clear and detailed	NFIGURATION IN		Demonstrate each activity of the	Working Personal Computer, Power
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the	NFIGURATION IN	4.2: Connect the entire computer system to.	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed	NFIGURATION IN	4.2: Connect the entire computer system	Demonstrate each activity of the	Working Personal Computer, Power
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the	NFIGURATION IN	4.2: Connect the entire computer system to.	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the	NFIGURATION IN	<ul><li>4.2: Connect the entire computer system to.</li><li>4.3: Power the</li></ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul><li>4.2: Connect the entire computer system to.</li><li>4.3: Power the Computer System.</li><li>4.4: Enter the BIOS /</li></ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul><li>4.2: Connect the entire computer system to.</li><li>4.3: Power the Computer System.</li></ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment pressing the</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment pressing the appropriate key[s]</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment pressing the appropriate key[s] at the expected</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment pressing the appropriate key[s] at the expected time.</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment pressing the appropriate key[s] at the expected time.</li> <li>4.5: Explore through the</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment pressing the appropriate key[s] at the expected time.</li> <li>4.5: Explore through the environment.</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,
	4.1: Describe BIOS / CMOS	Introduce with clear and detailed explanations the concept in the specific learning	NFIGURATION IN	<ul> <li>4.2: Connect the entire computer system to.</li> <li>4.3: Power the Computer System.</li> <li>4.4: Enter the BIOS / CMOS Setup environment pressing the appropriate key[s] at the expected time.</li> <li>4.5: Explore through the</li> </ul>	Demonstrate each activity of the Specific Learning	Working Personal Computer, Power and Signal Cables,

	1	12 in computer 11d	namare Buguteer	ing Technology (Draji)		
				correspond with		
				hardware		
				configuration		
				[Primary Master,		
				Secondary Masters,		
				Primary slave,		
				Secondary Slave,		
				Floppy Disk active		
				or deactive, cache,		
				processor clock		
				speed].		
5 GENE	RAL OBJECTIVE: KNOW THE	<b>ACTIVITES INVO</b>	LVED IN UPGRA	DING A COMPUTER.		
10-11				5.1: Identify the	Demonstrate each	Working
				motherboard of the	activity of the	Computer
				system to be	Specific Learning	System,
				upgraded.	Objectives.	Motherboard,
				5.2: Identify the		Processor, RAM
				processor and its		memory, Hard
				clock speed on the		disk drive, CD
				motherboard.		ROM drive, all
				5.3: Identify the RAM		with higher
				memory and size on		capacity than the
				the motherboard.		one in the
				5.4: identify the Hard		system.
				disk drive of the		,
				system.		
				5.5: Identify the CD		
				ROM drive speed of		
				the system.		
				5.6: Remove any of the		
				five [5] above to be		
				upgraded, and		
				Replace with a		

		12 in computer 110	il all all engineer	ing reciniology (Draji)		
				higher category of		
				the same		
				component.		
				5.7: Set the BIOS /		
				CMOS Setup		
				configuration to suit		
				the new		
				components.		
6 GENE	RAL OBJECTIVE: INSTALL	A PERSONAL COMI	PUTER FOR USE.			
12-13				<ul> <li>6.1: Identify the various computer components.</li> <li>6.2: Connect all other units correctly to the Processing Unit.</li> <li>6.3: Connect the Power Cables to the C. P. U. and Monitor.</li> <li>6.4: Identify the amount of voltage required for each unit.</li> <li>6.5: Set power to suit the Computer System and verse versa.</li> </ul>	Demonstrate each activity of the Specific Learning Objectives.	Central Processing Unit, Monitor, Keyboard, Mouse, Power Cables and electricity.
14	REVISION					

PROGRAMME: NID in Hard Ware Engineering

COURSE : PC Assembling and Upgrading.

CODE : CHT 212

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT : 4hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This course is designed to provide the leaner with advanced working knowledge of System

Architecture

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1. Know the concept of basic Optoelectronics.
- 2. Understand the Concept of the various operations in a Personal Computer.
- 3. Know the concept of SCSI Adapters and Troubleshooting.
- 4 . Understand Storage Devices and Operations of Computer Memory

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)									
COURS	E: SYSTEM ARCHITECTURE	II COURSE	CODE: CHT 21	.2 CON	ITACT HOURS:	84			
<b>GOAL:</b>	This course is designed t	o provide the lean	er with advance	d working knowledge o	f System Architect	ure.			
COURS	COURSE SPECIFICATION: Theoretical Contents: Practical Contents								
1 GENERAL OBJECTIVE: KNOW THE CONCEPT OF OPTOELECTRONICS.									
WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES			
1—3	1.1: Describe the concept of	-Explain the	Text Books,						
	Light Emitting Diodes	concept of Light	White Board,						
	[LED].	Emitting Diodes [LED].	Marker.						
	1.2: Outline rules needed	-Outline rules							
	when using LED.	needed when							
	e deg 2221	using LED.							
	1.3: Describe Photo-sensitive	Describe Photo-							
	Devices [Photo resistor,	sensitive Devices							
	photodiodes,	[Photo resistor,							
	Phototransistors,	photodiodes,							
	photosensitive ICs.]	Phototransistors,							
	, ,	photosensitive							
	1.4:Describe Fiber Optic	iCs.]							
	Systems.	- Explain Fiber							
		Optic Systems.							
	1.5: Outline the advantages of	-Outline the							
	Fiber Optics over Copper	advantages of							
	cables.	Fiber Optics over							
		Copper cables.							
2 GENE	RAL OBJECTIVE: UNDERST	AND THE CONCEP	T OF THE VARIO	US OPERATIONS IN A I	PERSONAL COMPUT	TER.			
4-5	2.1: Define Personal	-Explain Personal		2.5: Identify the	Demonstrate each	Microprocessor			

	Computer.	Computer.	<u> </u>	package used for	activity of the	Teaching Aid,
		-Outline		Word Processing.	Specific Learning	screw drivers,
	2.2: Itemize advantages of	advantages of		2.6: Identify the	Objectives.	multi-meter,
	Personal Computer.	Personal		package used for		micro computers,
		Computer.		Accounting.		motherboard,
		-Explain the		2.7: Identify the		Hard drive,
	2.3: Describe the various	various		package used for		memory, RAM,
	applications of computer.	applications of		Statistical Problems.		CD ROM Drive,
		computer.		2.8: Identify the		floppy disk drive.
		-Explain the		package used for		
	2.4:Define the Microprocessor.	Microprocessor		Database		
				Management.		
				2.9: Identify the		
				package used for		
				Internet		
				Communication.		
				210: Program a		
				microprocessor for		
				a complex task.		
			SI ADAPTERS AN	ID TROUBLESHOOTING.		
6-7	3.1:Define SCSI Variations	-Explain SCSI		3.5: Perform the	Demonstrate each	Blowers, IC
	concept.	Variations		Hardware	activity of the	extractor, set of
		concept.		Installation of the	Specific Learning	screw drivers,
	3.2: Describe the concept of	-Explain the		Adapter.	Objectives.	soldering iron,
	Bus Length.	concept of Bus		3.6: Perform the		lead sucker,
		Length.		Software		multi-meter,
	3.3: Define Terminators.	-Explain		Installation.		micro computers,
		Terminators.		3.7: Troubleshoot SCSI.		Installation disks,
	3.4:Describe SCSI Bus	-Explain SCSI Bus				Mother board.
	Operations.	Operations.				
4 GENI	RAL OBJECTIVE: UNDERS		EVICES AND OP	PERATIONS OF COMPUT		
8-10	4.1: Define Computer Memory.	1.1: Define		4.10: Identify the	Demonstrate each	Computer
		Computer		various computer	activity of the	System, RAM

	4.2: Describe the Random Access Memory concept.	MemoryExplain the Random Access Memory concept.		memory. 4.11 Transfer data / information in / out of the various	Specific Learning Objectives.	memory, Hard disk, Floppy Disk, Compact Disk, Flash disk.
	4.3: Describe the Cache RAM Memory concept.	-Explain the Cache RAM Memory concept.		computer memory, using Windows Operating System.		
	<ul><li>4.4: Describe the Hard disk drive.</li><li>4.5: Describe the Floppy Disks.</li></ul>	-Explain the Hard disk driveExplain the				
	4.6: Define the Compact Disk.	Floppy DisksDefine the Compact Disk.				
	4.7: Define the concept of optical disks.	Define the concept of optical disks.				
	<ul><li>4.9: Describe the Flash disk.</li><li>4.10 Describe the various labels for each computer memory.</li></ul>	-Describe the Flash disk.				
4 GENE	RAL OBJECTIVE: KNOW THE	CONCEPT OF BAS	I SIC NETWORK AI	RCHITECTURES AND AC	CESS.	
11-13	5.1: Describe the various Topologies.	-Explain the various Topologies.				
	5.2: Describe the Cable Basics.	-Explain the Cable Basics.				
	5.3: Describe Ethernet.	-Explain Ethernet.				
	5.4: Describe FDDI Basics.	-Explain FDDI Basics				

14	REVISION			

PROGRAMME: NID in Hard Ware Engineering

COURSE : Computer Workshop 11

CODE : CHT 213

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT: 6hrs

TOTAL CONTACT HRS: 84

**GOAL**: This course is designed to provide the learner with working knowledge of Computer Workshop

Practice.

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1. Understand the Concepts and Engineering of Scanners.
- 2. Understand the concepts and Engineering of Power Packs.
- 3. Understand the optimal Usage of Computer System and Computer Accessories.
- 4. Know the concepts and Engineering of Other Computer Accessories.

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)

COURSE: COMPUTER WORKSHOP II COURSE CODE: CHT 213 CONTACT HOURS: 84

GOAL: This course is designed to provide the learner with working knowledge of Computer Workshop Practice.

COURSE SPECIFICATION: Theoretical Contents: Practical Contents

GENERAL OBJECTIVE: UNDERSTAND THE CONCEPTS AND ENGINEERING OF SCANNERS.

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-4	1.1: Describe Scanner			1.1 Carryout the	Demonstrate each	Blowers, IC
				operation of a	activity of the	extractor, set of
	1.2 Explain the level of			scanner [turning	Specific Learning	screw drivers,
	accuracy			on/off, connecting	Objectives.	soldering iron,
				the interface cable,		lead sucker,
				using available		multi-meter,
				functions like Pre-		micro computers,
				scan, Scan, Print,].		Installation, disks
				1.2: Identify scanner		to include Anti
				problem [hardware		virus, scraps of
				or software].		CPU, Mother
				1.3: Troubleshoot the		board, Hard
				Scanner.		drive, memory,
				1.4: Effect repairs on		RAM, CD ROM
				the Scanner, using		Drive, floppy disk
				the appropriate		drive.
				tool[s] or		
				equipment.		

GENER	AL OBJECTIVE:		<u> </u>		RING OF POWER PACKS		
5-7					2.1: Describe the	Demonstrate each	Blowers, IC
					Computer Power	activity of the	extractor, set of
					Pack.	Specific Learning	screw drivers,
					2.2: Identify the Power	Objectives.	soldering iron,
					Pack.		lead sucker,
					2.3: Troubleshoot the		multi-meter,
					Power Pack. [fuse,		micro computers,
					switch, wire,		scraps of CPU.
					resistor, capacitor,		
					transistor], using		
					multi-meter or		
					appropriate		
					instrument.		
					2.4: Effect Repair.		
	AL OBJECTIVE:	UNDERSTAN	ID THE OPTIMAL U	JSAGE OF COMP	UTER SYSTEM AND COM	1	
8-10					3.1: Connect the	Demonstrate each	Micro computers,
					Computer System	activity of the	disks drive
					and accessories	Specific Learning	cleaner, Hard
					correctly.	Objectives.	drive, memory,
					3.2: Power the System		RAM, CD ROM
					to work.		Drive, floppy disk
					3.3: Perform advance		drive.
					maintenance tasks		Internet
					on the computer		Connectivity.
					system [run		
					computer		
					defragmenter,		
					create backup of		
					files, connect to		
					internet and		
					download necessary		
1					utility tools and		

		1D in Computer Ha	manuale Brigineer	ing rechnology (Draji)		
				program updates, clean drives using appropriate disk cleaners].		
GENER	AL OBJECTIVE: KNOW THE C	ONCEPTS AND EN	GINEERING OF	OTHER COMPUTER ACC	ESSORIES.	
11-13				<ul> <li>4.1: Identify other Computer Accessories.</li> <li>4.2: Identify their problem.</li> <li>4.3 Troubleshoot the accessories.</li> <li>4.4: Effect Repairs.</li> </ul>	Supervise the learner to achieve the Specific Learning Objectives.	Blowers, IC extractor, set of screw drivers, soldering iron, lead sucker, multi-meter, micro computers, Installation, disks to include Anti virus, scraps of CPU, Mother board, Hard drive, memory, RAM, CD ROM Drive, floppy disk drive, First Aid
14	REVISION					box.

GOAL : This course is designed to provide the learner with working knowledge of Basic Networking

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1.1 Understand data communication and the various equipment/components
- 1.2 Understand modulation and de-modulation
- 1.3 Understand multiplexing and de-multiplexing

GOAL : This course is designed to provide the learner with working knowledge of Basic Networking

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1. UNDERSTAND THE CONCEPTS AND ENGINEERING OF SCANNERS
- 2. Understand data communication and the various equipment/components
- 3. Understand modulation and de-modulation

PROGR	PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)								
COURS	E: BA	SIC NETWORKING	COURSE			ITACT HOURS:	84		
GOAL:		This course is designed t	to provide the lear	ner with workin	g knowledge of Basic N	etworking			
COURS		ECIFICATION: Theoretical		Practical (					
GENER	GENERAL OBJECTIVE: UNDERSTAND THE CONCEPTS AND ENGINEERING OF SCANNERS.								
WEEK	S	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES		
GENER	AL O	BJECTIVE: 1.1 Understand	data communication	and the various e	quipment/components				
1-7	1.1	Define data	-Explain data		Identify data	Supervise learners in	2 or more personal		
		communication	communication.		communication	achieving the	computers,		
	1.2	List the various	-Explain different		components.	specified objectives	MODEMs of		
		equipment used for	equipment and				various types,		
		data communication	components used in		identify the common types		coaxial cable, R-		
			data		of network cables, their		J45,		
			communication		characteristics and		Clips/truneking		
					connectors		Explain basic		
	1.3	Describe multiplexing and	Explain		(a) Cable types		networking		
	de-m	ultiplexing	multiplexing and		include:		concepts including		
		-	de-multiplexing		Coaxial, UTP,		how a networks		
					CAT 3, CAT		Concepts		
			1.1 Explain		5/e, CAT 6,		likeInstalling and		
			common		STP, fiber		configuring		
			technologies		(b) Connector		network cards,		
			available for		types include:		Addressing,		
			establishing		BNC, RJ-45,		Bandwidth.		
			Internet		AUI, ST/SC,		(a) Status		
			connectivity		IDC/UDC.		indicators,		
			and their				protocols,		
			characteristics				TCP/IP,		
			(a) Technol				IPX/SPX,		
			ogies				Apple talk,		

	,	Explain the various tools used			
	de-modulation 3.2 identify various tools used.	modulation and de-modulation			
8-13	3.1 Describe modulation and	Explain			
GENER	RAL OBJECTIVE: Understand n	nodulation and de-	modulation	1	<u> </u>
					Routers.
					connectors, Hub/Switches,
					fibre optic cables,
		connections			infrared
		speed and			client/server,
		include: Definition,			peer-to-peer,
		Wireless Characteristics			Networking models,
		Satellite,			RS-232,
		Dial-up,			fiber optics,
		ISDN,			coaxial,
		Cable,			twisted pair,
		LAN, DSL,			half-duplex (b) Cabling-
		include:			Full-duplex,

PROGRAMME: NID in Hard Ware Engineering

COURSE Consumer Electronics

CODE : CHT 232

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT : 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL : This course is designed to provide the learner with the Practical knowledge of consumer Electronics

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1.1 Understand the concept of consumer electronics
- 1.2 Understand the building blocks and modules of television, radio receivers etc
- 1.3 Understand the concept of maintenance culture in computer and electronics

Second Year Second Semester

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)

COURSE: CONSUMER ELECTRONICS COURSE CODE: CHT232 CONTACT HOURS: 84

**GOAL:** This course is designed to provide the learner with the Practical knowledge of consumer Electronics

COURSE SPECIFICATION: Theoretical Contents: Practical Contents

1.4

**GENERAL OBJECTIVE: UNDERSTAND THE CONCEPTS of consumer electronics** 

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-5	1.1 Describe the concept in television, radio, computer monitors(VDU), VCD players, multi-media  1.2 Identify tools used in electronic repairs such as: Tv, VCD players, multi-media projectors etc.	Explain the concept in television, radio, computer monitors(VDU), VCD players, multimedia  1.2 Mention tools used in electronic repairs such as: Tv, VCD players, multi-media projectors etc.		1.2 Repair television, radio, computer monitors(VDU), VCD players, multi-media etc	Demonstrate how to repair VDU, TELEVISION, PRINTERS, c.p.u power packs and general maintenance etc	Blowers, IC extractor, set of screw drivers, soldering iron, lead sucker, multi-meter, micro computers, Installation, disks to include Anti virus, scraps of CPU, Mother board, Hard drive, memory, RAM, CD ROM Drive, floppy disk drive, First Aid box.
CENED	AL ODIECTIVE, Understand th	محمد ماممالم مناطنه	mandulas of talaui	aion radio raccivara ata		

**GENERAL OBJECTIVE**: Understand the building blocks and modules of television, radio receivers etc

6-9	2.1 Describe building blocks of	Explain building			
	a TV and RADIO	blocks of a TV			
	2.2 Identify various building	and RADIO			
	blocks in electronics	mention various			
		building blocks in			
		electronics			
GENER	AL OBJECTIVE: Understand t	he concept of repa	irs and mainten	ance in electronics/com	puter
10-13	3.1Describe the concept of	Explain the		Demonstrate the concept	Teacher learners
	repairs and maintenance in	concept of repairs		of repairs and maintenance	how to repair
	electronics.	and maintenance in		in electronics.	electronics gargets
		electronics.			such computers,
	3.2 Define the concept of repairs			Indentify the concept of	vcd, radios
	of C.P.U. power supply	Explain the concept		repairs of C.P.U. power	television etc
	packs	of repairs of C.P.U.		supply packs	
		power supply packs			
14	R E V I S	I O N			

PROGRAMME: NID in Hard Ware Engineering

COURSE Trouble-shooting and Repairs

CODE : CHT 221

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT: 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL This course is designed to provide the learner with working knowledge of Trouble-shooting and Repairs

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1.1 Understand troubleshooting and repairs techniques
- 1.2 Understand power supply troubleshooting in a computer environment
- 1.3 Know the basic concept of pc repairs and its tools
- 1.4 Appreciate the need for pre-installation planning and basic needs of a computer room

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)								
COURSE: TROUBLESHOOTING AND COURSE CODE: CHT221 CONTACT HOURS: 84								
REPAIRS								
GOAL: This course is designed to provide the learner with working knowledge of Trouble-shooting and Repairs								
COURSE SPECIFICATION: Theoretical Contents: Practical Contents								

GENERAL OBJECTIVE: UNDERSTAND TROUBLESHOOTING AND REPAIRS TECHNIQUES

WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-4	1.1 Identify basic components and	Explain basic		1.4 Identify basic	Enumerate causes of	Diagnostic disks,
	chips in pcs and mainframes	components and		components and chips	component failures	Installation disks
	1.2 Describe causes of component	chips in pcs and		in pcs and mainframes	such as:	to include Anti
	failures such as:	mainframes			k. Intermittent	Virus.
	a. Intermittent failure	Explain causes of		1.5 Use general	failure	
	b. Solid failure	component failures		troubleshooting techniques	<ol> <li>Solid failure</li> </ol>	Blowers, IC
	c. Marginal failure	such as:		to detect:	m. Marginal failure	extractor, set of
	d. Dry joints	f. Intermittent		(o) Error Categories	n. Dry joints	screw drivers,
	e. Power surges	failure		(p) Event Viewer	o. Power surges	soldering iron, lead
		g. Solid failure		(q) Device Manager	Explain general	sucker, multimeter,
		h. Marginal failure		(r) System	troubleshooting	micro computers,
		i. Dry joints		Information	techniques	Installation, disks
	1.3 Describe general	j. Power surges		(s) The Emergency	(v) Error	to include Anti
	troubleshooting techniques	Explain general		Repair Process	Categories	virus, scraps of
	(a) Error Categories	troubleshooting		(t) Program Stops	(w)Event	CPU, Mother
	(b) Event Viewer	techniques		Responding	Viewer	board, Hard drive,
	(c) Device Manager	(h) Error		(u) Optimizing	(x) Device	memory, RAM,
	(d) System Information	Categories		windows	Manager	CD ROM Drive,
	(e) The Emergency Repair	(i) Event			(y) System	floppy disk drive,
	Process	Viewer			Information	First Aid box.
	(f) Program Stops	(j) Device		Troubleshoot Power	(z) The	
	Responding	Manager		problems	Emergency	
	(g) Optimizing windows	(k) System		(g) Troubleshooting	Repair	

		Information		Post (beeps and	Process	
		(l) The		error codes)	(aa) Progr	
	Describe how to troubleshoot	Emergency		(h) Internet Devices	am Stops	
	Power problems	Repair		Peripherals	Responding	
	(a) Troubleshooting Post	Process		1 cripherais	(bb) Opti	
	(beeps and error codes)	(m)Program			mizing	
	(b) Internet Devices	, , ,			indows	
	(c) Peripherals	Stops Responding			indows	
	(c) Peripherais	1				
		(n) Optimizing indows			1.5 Describe how to	
		indows			troubleshoot	
		1.2 Daniella land			Power problems	
		1.3 Describe how to			Troubleshooting	
		troubleshoot			Post (beeps and	
		Power problems			error c	
		(d) Troublesho				
		oting Post				
		(beeps and				
		error codes)				
		(e) Internet				
		Devices				
		(f) Peripherals				
	AL OBJECTIVE: Understand pov	ver supply troublesho	oting in a comput			
5-7	2.1 Describe how to troubleshoot	Explain how to		Demonstrate how to	Teach how to	
	Power problems	troubleshoot Power		troubleshoot Power	troubleshoot Power	
	(i) Troubleshooting Post	problems		problems	problems	
	(beeps and error codes)	(l) Troublesho		(o) Troubleshooting	(r) Troubleshoo	
	(j) Internet Devices	oting Post		Post (beeps and	ting Post	
	(k) Peripherals	(beeps and		error codes)	(beeps and	
		error codes)		(p) Internet Devices	error codes)	
		(m)Internet		(q) Peripherals	(s) Internet	
		Devices		_	Devices	
		(n) Peripherals			(t) Peripherals	
		_				

	2.2 Correct power supply or earth connection related problems		Explain power supply or earth connection related problems	23	Correct p	power supply or nection related	Explain power supply or earth connection related problems	
GENER	AL OR	JECTIVE: Understand b	asic concent of no	renairs				
8-10	3.1 D	escribe the Concept of as of Personal Computers  Identify the necessary tools used in repair and maintenance e g Oscilloscopes, multimeter	Explain the Concept of Repairs of Personal Computers Identify the necessary tools used in repair and maintenance e g Oscilloscopes,mult	•	Repairs of Compute  3.6 Ic	be the Concept of of Personal rs  dentify the ecessary tools sed in repair and naintenance e g	Explain the Concept of Repairs of Personal Computers Identify the necessary tools used in repair and maintenance e g Oscilloscopes, multimeter	
	3.5	Application of preventive methods in pcs eg installation of anti-virus	imeter Application of preventive methods in pcs eg installation of anti-virus		m Applicati met	scilloscopes, nulti-meter on of preventive chods in pcs eg allation of anti- s	Application of preventive methods in pcs eg installation of antiviru	
GENER	AL OB	JECTIVE: Appreciate the	e need for pre-inst	allation planning			omputer room	
11-13	4	Determine the space needs and services, cleaniness of a computer studio	Explain the space needs and services, cleanines s of a computer studio Explain the		4.5	Identify the space needs and services, cleani ness of a computer	Explain the space needs and services, cleaniness of a computer studio Explain the factors	
	4.3	and installing computer equipment	factors necessary for fitting and installing		4.6	studio Determine power supply	necessary for fitting and installing computer	

	The tit complited Hell eliter e Eliginee	1116 200111010 8) (21091)	T T
supply requirements	computer	requirements	equipment
for various types of	equipment	for various	State the power
computer	State the power	types of	supply
equipment:	supply	computer	requirements for
a. Single phase supply	requirements for	equipment:	various types of
b. Double phase supply	various types of	c. Single phase	computer
4.4 Inspect:	computer	supply	equipment:
a. False flowing	equipment:	Double phase supply	Single phase
b. Cable trenching in a	Single phase	4.7 Inspect:	supply
typical large computer	supply	e. False flowing	Double phase
installations	Double phase	f. Cable trenching in	supply
4.5 Identify the various	supply	a typical large	Inspect:
types of fire fighting tools	Inspect:	computer	g. False
in a computer.	c. False	installations	flowing
	flowing	4.5 Identify the various	h. Cable
	d. Cable	types of fire fighting	trenching in
	trenching	tools in a computer	a typical
	in a typical		large
	large		computer
	computer		installations
	installation		Identify the
	S		various types of
	Identify the		fire fighting tools
	various types of		in a computer.
	fire fighting tools		
	in a computer.		
14 R E V	I S I O N		·

PROGRAMME: NID in Hard Ware Engineering

COURSE Software Installation and PC Upgrading.

CODE : CHT 222

DURATION: Hours/Week Theory: 2hrs Practical: 4hrs

UNIT: 6hrs

**TOTAL CONTACT HRS: 84** 

GOAL This course is designed to provide the learner with practical knowledge of software installations and pc upgrading

GENERAL OBJECTIVE: On completion of this course the learner should be able to:

- 1.1 Understand the concept of operating system
- 1.2 Know the concept of software { windows } installation procedures
- 1.3 Understand pre-installation requirements

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)						
COURS	<b>E:</b> Software Installation and PC	COURSE	CODE: CHT 22	2 <b>CO</b>	NTACT HOURS:	84
Upgradii						
GOAL:	This course is designed				are installations an	d pc upgrading
COURS	E SPECIFICATION: Theoretic	al Contents:	Practical (	Contents		
GENER	AL OBJECTIVE: UNDERSTAN	D THE CONCEPTS	OF OPERATING	SYSTEM	1	
WEEK	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES	SPECIFIC LEARNING OBJECTIVE	TEACHERS ACTIVITIES	LEARNING RESOURCES
1-4	<ul><li>1.1 Define Operating packages, Systems(OS), Applications, device drivers.</li><li>1.2 Identify the functions of O.S</li></ul>	Explain Operating packages, Systems(OS), Applications, device drivers. Identify the functions of O.S Explain the installation procedures for Windows OS and non Windows OS				Chalkboard,comp uters printers,ups,
GENER	AL OBJECTIVE: KNOW THE CO	NCEPT OF SOFTWAR	E{WINDOWS} IN	STALLATION		
5-9	2.1 Describe the installation procedures for Windows OS and non Windows OS	Explain the installation procedures for Windows OS and non Windows OS			Demonstrate the installation procedures for Windows OS and non Windows OS	
				Install various application		

	1,		Taware Buguteer	software	
	2.2 Identify and install various	Install various		software	Demonstrate how to
	application software				install various
	application software	application			
CENIER	AL ODJECTIVE LINDEDCTAN	software	TON DECLIDEN		application software
	RAL OBJECTIVE: UNDERSTAN		TON REQUIREM	ENT	
10-13		.Explain Pre-			Explain Pre-
	3.1Define Pre-Installation	Installation		3.1 Use the procedures for	Installation
	considerations	considerations		the Installation of	considerations
	Minimum and Recommended	Minimum and		Windows 98 (FDISK,	Minimum and
	requirements, Hardware	Recommended		FORMAT, File copy,	Recommended
	Compatibility List (HCL), Startup	requirements,		SETUP, GU1 phase),	requirements,
	Disk(s), Installation CD, CD key,	Hardware		Windows 200x/Xp (SCS 1	Hardware
	computer name etc.	Compatibility List		driver, EULA, Partition,	Compatibility List
		(HCL), Startup		format, file copy, GU1	(HCL), Startup
	3.2 Outline the procedures for the	Disk(s), Installation			Disk(s), Installation
	Installation of Windows 98	CD, CD key,			CD, CD key,
	(FDISK, FORMAT, File copy,	computer name etc.		3.3 Use the various File	computer name etc.
	SETUP, GU1 phase),			Systems FAT 16, FAT 32,	
	Windows 200x/Xp (SCS 1 driver,	3.2 identify the		NTFS	3.2 State the
	EULA, Partition, format, file	procedures for the			procedures for the
	copy, GU1	Installation of			Installation of
		Windows 98			Windows 98
	<b>3.3.</b> Differentiate Booting files	(FDISK,			(FDISK, FORMAT,
	(for example IO.SYS,	FORMAT, File			File copy, SETUP,
	MSDOS.SYS, CONFIG>SYS,	copy, SETUP, GU1			GU1 phase),
	COMMAND.COM,	phase),			Windows 200x/Xp
	AUTOEXEC.BAT etc.	Windows 200x/Xp			(SCS 1 driver,
	Windows 9x – IO.SYS,	(SCS 1 driver,			EULA, Partition,
	WIN.COM etc	EULA, Partition,			format, file copy,
	Windows 200x/XP-NTLDR,	format, file copy,			Booting files (for
	Boot.INI, NTDETECT etc	Booting files (for			example IO.SYS,
		example IO.SYS,			MSDOS.SYS,
	3.4 Identify the various File	MSDOS.SYS,			CONFIG>SYS,
	Systems FAT 16, FAT 32, NTFS	CONFIG>SYS,			COMMAND.COM,
		COMMAND.COM,			AUTOEXEC.BAT

3.5 Describe the CMOS/BIOS,	AUTOEXEC.BAT	etc.	
and how they work.	etc.	Windows 9x –	
	Windows 9x –	IO.SYS, WIN.COM	
Differentiate between DOS &	IO.SYS,	etc	
Windows, & how to use the	WIN.COM etc	Windows 200x/XP-	
DOS commands (e.g DIR,	Windows 200x/XP-	NTLDR, Boot.INI,	
CLS, MD, Del	NTLDR, Boot.INI,	NTDETECT etc	
	NTDETECT etc		
		3.4 Demonstrate the	
	3.4 Identify the	various File Systems	
	various File	FAT 16, FAT 32,	
	Systems FAT 16,	NTFS	
	FAT 32, NTFS		
	3.5 Describe the		
	CMOS/BIOS, and		
	how they work.		
	Differentiate		
	between DOS &		
	Windows, & how to		
	use the DOS		
	commands (e.g		
	DIR, CLS, MD, Del		
14 R E V I	S I O N		

PROGRAMME: NATIONAL INNOVATION DIPLOMA IN COMPUTER HARDWARE ENGINEERING TECHNOLOGY (NID)						
COURS	COURSE: Practice of Entrepreneurship COURSE CODE: I				CONTACT HOURS: 30	
GOAL:						
COURS	E SPECIFICATION: Theoretic	al Contents:		Practical Conter		
	General Objective:			General Objecti	ve: On completion of thi learner should be able	
Week	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learnir Objective	Teachers Activities	Learning Resources

Technology (Draft)	Engineering	rdware E	D in Computer Har	NI.

COURS	E: Project	CC	OURSE CODE:	CHT 224	CONTA	CT HOURS: 84	
GOAL:	-						
COURS	E SPECIFICATION: Theoretic	al Contents:		Practical Cont	ents		
	General Objective:			General Objec		completion of the ner should be ab	
Week	Specific Learning Objective	Teachers Activities	Learning Resources	Specific Learn Objective		Teachers Activities	Learning Resources
				Select from re- topics across c within the prog Design, Build write report or selected topic, understand the supervision of supervisor.	ourses gramme. and the		

## COMPUTER HARDWARE ENGINEERING TECHNOLOGY

### **List of Equipment for NID Laboratory (Minimum Requirement)**

	<b>HARDWARE</b>	NOS.
1.	PCs Computer Systems (Pentium 4 with 1.6GH <sub>2</sub> , 256MB RAM; 40GB HDD Internet ready	10
2.	Hp LaserJet Model	1
3.	DeskJet Model	1
4.	Summa graphic digitizer	1
5.	Hp scan jet	1
6.	LCD scan jet	1
7.	Magic Board	1
8.	Digital Camera	1
9.	Various Networking Materials (HUB, Coaxial Cable RJ 45, Modem)	
10.	Oscilloscope 5-10mHz, 20mHz	1 each
11.	Soldering Iron	20pcs
12.	Digital Multi Meter	20pcs
13.	Analogue Multi Meter	20pcs
14.	Base Board	20pcs

15.	Various Electronic Tools	O	O	20set
16.	Electronic Work Bench			Various Nos.
17.	Micro-processor Teaching Aid			2 Units

## Names of Participants in NID Critique Workshop (Computer Hardware Engineering Technology)

S/No	<u>Names</u>		Address
1.	Engr. B.A Odufuwa (Chairman)	-	Lagos City Polytechnic, Lagos
2.	Falokun, Adeshina B. (Secretary)	-	Global Web ICT Institute, Abuja
3.	Muktar Aminu	-	F.C.E. Kano
4.	A.O. Jegede	-	St. Wilifred Computer Institute, Ibadan
5.	Engr. Dr. Nuru A Yakubu, OON	-	Executive Secretary, NBTE Kaduna
6.	Dr. M S Abubakar	-	Director (Programmes) NBTE, Kaduna
7.	Engr. J. O. Falade	-	HOD Polytechnic Division, NBTE, Kaduna
8.	Engr. A D K Muhammad	-	D O VEI/IEI, NBTE Kaduna
9.	Mrs. F.B. Olorunpomi	-	NBTE, Kaduna
10.	Miri Ebipade	-	NBTE, Kaduna
11.	Okechukwu O.C.	-	NBTE, Kaduna