

# Module Descriptions

**Department of Computer and  
Information Technology Skills**

**Computer Maintenance and Networking Skills**

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Information Technology Skills**

**Computer Maintenance and Networking Skills**

**2009**





# DEGREE PLAN

## Computer Maintenance and Networking Skills (CMNS)

### Level 1

Sr.	Module Code	Module Name	Contact Hours
1	ITMN 135	Advanced Computer Applications	88
2	ITMN 136	Basic Electronics	40
3	ITMN 137	Digital Electronics	48
4	ITMN 138	Operating System 1	64
5	ENGC102	English Communication 1	24
<b>TOTAL HOURS</b>			<b>264</b>

### Level 2

Sr.	Module Code	Module Name	Contact Hours
1	ITMN 239	Computer System Fundamentals	88
2	ITMN 240	PC Servicing and Repair	64
3	ITMN 241	Portable Technology	48
4	ITMN 242	Operating System 2	40
5	ENGC203	English Communication 2	24
<b>TOTAL HOURS</b>			<b>264</b>

### Level 3

Sr.	Module Code	Module Name	Contact Hours
1	ITMN 343	Interpersonal Communication	32
2	ITNA 201	Network Fundamentals	144
3	ITMN 344	Network Security	32
4	ITMN 345	Network Cabling and Connectivity	32
5	TRWT 304	Technical Report Writing 1	24
<b>TOTAL HOURS</b>			<b>264</b>

### Level 4

Sr.	Module Code	Module Name	Contact Hours
1	ITMN 446	Routing Protocols and Concepts	160
2	ITMN 447	Network Design and Implementation	80
3	TRWT 405	Technical Report Writing 2	24
<b>TOTAL HOURS</b>			<b>264</b>

### Coop (15 Weeks)

Sr.	Module Code	Module Name	Equivalent Contact Hours
1	ITMN 548	Cooperative Training Program	<b>128</b>

Prerequisite **BSCA 303**Level **1**Contact Hours: **88**

**Module Description** The module will cover Microsoft Office Presentation, Database and Communication.

**Objectives** The objectives of this module is to:

- Develop basic conceptual and hands-on skills in the use of different Microsoft Office applications in a Windows environment.
- Concentrate on the practical exercises for the student to be familiar with Power Point, Access and Outlook.

**Learning Outcomes** After completing this module the student will be able to:

- Work with Microsoft office applications (Power Point, Access & Outlook).
- Define technical terms related to the mentioned software applications.

**Contents**

- Review ICDL –I (IT Concepts, PC & Managing Files, Word, Excel)
- Microsoft Power Point
- Microsoft Access (Database)
- Microsoft Outlook (Communication)

### Pacing Schedule

Contact Hours	Contents	Skills Gained
10	<b>Review ICDL –I (IT Concepts, PC &amp; Managing Files, Word, Excel)</b>	Practice ICDL-I
	Information Technology Concepts PC & Managing Files Microsoft Word Microsoft Excel	
28	<b>Microsoft Power Point</b>	Work with Microsoft Power Point
	Power Point Basics Creating Presentations Working with Presentation Templates Work with Presentation Views Building Custom Presentations Modifying templates Building custom templates Building custom slide masters Advanced slide master techniques Using Multimedia in Presentations Working with Graphics in Power Point Show Time Working with Text in Power Point Advanced clip art and drawing techniques Adding movies and sound Using animations Using scanned images	
	<b>Assessment 1</b>	

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
	<b>Microsoft Access(Database)</b>	
32	Database Concepts Database concepts and terminology Exploring the Access environment Planning and designing databases Closing a database and Access Access Basics Exploring tables Examining queries Exploring reports Creating Databases Using the table wizard Working in design view Working with Fields and Records Changing the design of a table Adding and deleting records Finding and editing records Sorting and filtering records Querying Tables Creating and using queries Modifying query results and queries Using calculations in queries Creating and Using Forms Creating forms by using AutoForm Using the form wizard Using design view Finding, sorting and filtering records Creating and Using Reports Using the report wizard and queries Creating, modifying and printing reports	Work with Microsoft Access
	<b>Assessment 2</b>	

Prerequisite **BSCA 303**Level **1**Contact Hours: **88****Pacing Schedule**

Contact Hours	Contents	Skills Gained
18	<b>Microsoft Outlook (Communication)</b>	Work with Microsoft Outlook
	Getting Started The program window The Help system Setting up Outlook to work with email Connecting to the internet E-mail accounts Creating an email message Retrieving and Reading email Deleting an email message Junk email View your list of junk email senders Address Books E-mail and Contact Management The master category list Tasks Working with tasks Managing tasks	
	<b>Final Assessment</b>	

Reference:

Step By Step Microsoft Office XP. (Microsoft Press).

**Module Description** This module covers basic electricity and electronics topics needed to understand electronics concepts taught in the curriculum.

**Objectives** This module lead to:

- Familiarize with basic electrical quantities and units
- Draw and identify electronic component schematic symbols.
- Identify and test passive/ active components.
- Develop skill in resistor color coding.
- Solve simple Ohm's Law problems
- Familiarize with different circuit configurations
- Familiarize with terminology used in AC circuits
- Know the operating principle of the Low Voltage Power Supply and its parts.

**Learning Outcomes** After completing this module the student will be able to:

- Explain fundamental concept of basic electronics
- Connect simple circuit
- Know the functions of basic components and its symbols.
- Explain the different kind of connection
- Understand passive components
- Know AC Circuits
- Understand active components
- Know the importance of Rectifier
- Construct power supply

**Contents**

- Introduction to Electronics
- Five Fundamental Electronic Quantities
- Basic Electronic Symbols And their Functions
- Ohms Law Series/Parallel Combination
- Passive Components
- AC Circuits
- Active Components
- Rectifications/ Rectifier
- Power Supply Construction

Prerequisite —

Level 1

Contact Hours: 40

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
5	<b>Introduction to Electronics</b>	Explain Fundamental concept of basic electronics
	Elements Electron Theory	
	Sources of Electricity/ AC and DC	
	Conductors and Insulators	
	Voltage	
	Current	
	Resistance	
2	<b>Five Fundamental Electronic Quantities</b>	Connect simple circuit
	Voltage	
	Current	
	Switch	
	Load	
	Wire	
4	<b>Basic Electronic Symbols And their Functions</b>	Know the functions of basic components and its symbols
	Resistor	
	Capacitor	
	Diode	
	Transistor	
	Battery	
2	<b>Assessment 1</b>	
5	<b>Ohms Law Series/Parallel Combination</b>	Explain the different kind of connection
	Ohms law	
	Series Circuit	
	Parallel Circuit	
4	<b>Passive Components</b>	Passive components
	Resistors-types, ratings, color code, tolerance, fixed valued, variable thermistor, negative and positive temperature co-efficient.	
	Capacitors-types, (air, paper, ceramic, polystyrene, mica, electrolytic) fixed valued and variable, ratings, capacitance.	
	Inductors- types, inductors for high frequency applications, inductance & mutual inductance	
	Relays	
2	<b>Transformer &amp; Transformer Equations</b>	Knows AC Circuits
	<b>AC Circuit</b>	
2	Frequency	Knows AC Circuits
	Capacitive / Inductive Reactance	
2	<b>Assessment 2</b>	

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
3	<b>Active Components</b>	Active components
	Semiconductors	
	Diodes	
5	<b>Rectifications/ Rectifier</b>	Know the importance of Rectifier
	Half Wave	
	Full Wave	
	Filter	
4	<b>Power Supply Construction</b>	Construct power supply
	Half wave	
	Full wave	
	Bridge Type	
2	<b>Final Assessment</b>	

Reference:  
Basic Electronics by Bernard Groub.

Prerequisite —

Level 1

Contact Hours: 48

**Module Description** This module in digital electronics providing an overview of number systems associated with digital electronics, logic gates, and logic gate simplification.

**Objectives** This module will expose the students to:

- Digital circuits inside a computer system
- Allowing them to construct schematic diagram
- Allowing them troubleshoot digital circuits from schematic diagrams

**Learning Outcomes** After completing this module the student will be familiar with:

- Number system.
- Basics of logic gates, how to construct truth tables.
- Simplification of the Boolean expression, De Morgan's theorem & Half-Full Adder

**Contents**

- Data Representation
- Logic Gates
- Boolean Algebra

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
14	<b>Data Representation</b>	Familiarity with number system
	Binary Number System	
	Conversion from Decimal to Binary	
	Conversion from Binary to Decimal	
	Octal Number System	
	Conversion from Decimal to Octal	
	Conversion from Octal to Decimal	
	Hexadecimal Number System	
	Conversion from Decimal to Hexadecimal	
	Conversion from Hexadecimal to Decimal	
	Binary Arithmetic	
2	<b>Assessment 1</b>	
15	<b>Logic Gates</b>	Basics of logic gates, how to construct truth tables
	Logic Symbols	
	Inverter	
	Inverter truth table	
	And Gate	
	And gate truth table	
	OR Gate	
	OR gate truth table	
	NAND Gate	
	NAND gate truth table	
	NOR Gate	
	NOR gate truth table	
	XOR Gate	
	XOR gate truth table	
2	<b>Assessment 2</b>	

Prerequisite —

Level 1

Contact Hours: 48

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
13	<b>Boolean Algebra</b>	Simplification of the Boolean expression, De Morgan's theorem & Half-Full Adder
	Boolean Addition	
	Half Adder	
	Full Adder	
	Laws of Boolean algebra	
	Commutative law	
	Associative law	
	Distributive law	
	Rules of Boolean Algebra	
	De Morgan's Theorem	
	Boolean Expressions for a logic circuit	
	Constructing a truth table for a logic circuit	
	Simplification using Boolean algebra	
	Boolean Expressions and truth tables	
	Digital Building blocks	
Latches		
Buffers		
2	<b>Final Assessment</b>	

Reference:

Digital Fundamentals by Floyd &amp; Jain (Eighth Edition)

**Module Description** This module will cover Windows XP Operating System Installation, Windows up-gradation, Boot Sequence, File management, File System, Disk Partitions, Disk Maintenance, Printer Sharing, Task Manager, System Tools, Windows Accessories, Search Engine, Device Manager, and Burning optical Disks.

**Objectives** The objectives of this module is to:

- Study of Operating System for personal computers.
- Study Windows and concept of Information Technology hardware and software.
- Enhance students' understanding of PC operation.

**Learning Outcomes** After completing this module the student will be able to:

- Work with Microsoft Windows.
- Install/run operating System and Windows based applications.
- Define technical terms related to the mentioned applications.

**Contents**

- Introduction to Operating System & IT Concepts
- Windows XP Installation
- Disk Partition
- File System
- Windows Maintenance Tools
- File Management
- Monitoring & Analysis of System Performance
- Windows Accessories

Prerequisite —

Level 1

Contact Hours: 64

**Pacing Schedule**

Contact Hour	Contents	Skills Gained
12	<b>Introduction to Operating System &amp; IT Concepts</b>	Familiarization with Computer Hardware
	Definition of computer, Hardware & Software Input & Output devices. Main Parts of a Personal Computer Operating System Definition Operating System Families Operating System Functions/ Services Operating System Components Shell( GUI & CLI) Kernel	
12	<b>Windows XP Installation</b>	Installation & Configuration
	Installation & Configuration Introduction to BIOS (CMOS) Setup Practical (F10, F12,DEL) Setting Boot Sequence (CD Boot) Setup Installation Types An Upgrade New Installation Multi Boot Installation	
	<b>Disk Partition</b>	
	Partition Types Primary Partition Boot Partition System Partition Extended Partition Logical Partition Partition Size Disk Format Format By Using FAT32 Format By Using NTFS Quick Format	
	<b>Assessment 1</b>	

**Pacing Schedule**

Contact Hour	Contents	Skills Gained
6	<b>File System</b>	File System
	FAT8 FAT16 FAT32 HPFS NTFS (New Technology File System) CDFS (Compact Disk File System) Converting FAT32 to NTFS	
15	<b>Windows Maintenance Tools</b>	Windows Advanced User Skills
	Disk Maintenance Disk Defragmenter Disk Cleanup Check Disk Disk Backup Disk Partition (Windows GUI) Optimizing Windows Windows Components Windows Components Windows Services Windows Control Panel Device Manager Device Drivers Upgrading Existing Windows Exploring Windows Registry Managing Printing Options Printer Setup Printer Driver Printer Sharing Printer Delete Printer Pause/Cancel	
	<b>Assessment 2</b>	

Prerequisite —

Level 1

Contact Hours: 64

**Pacing Schedule**

Contact Hour	Contents	Skills Gained
6	<b>File Management</b>	Operating System Fundamental & File Management
	Creating and understanding Folders' hierarchy. Creating and Saving Files. Copy, Cut, delete, restore, rename Files & Folders. Dragging and dropping Files & Folders from one location to another. Create icons for Files, Folders, Floppy drives, hard drives, CD-ROM drives, etc. Transfer of Data Searching Files File Types	
6	<b>Monitoring &amp; Analysis of System Performance</b>	Operating System Performance
	Windows Task Manger Windows Accessibility Magnifier, Narrator, On-Screen Keyboard	
7	<b>Windows Accessories</b>	Windows Accessories
	System Tools Files & Settings Transfer System Restore Task scheduler Communication Tools Remote Desktop Connection Hyper Terminal Network Connection Dial up Connection Wireless Connectivity Address Book	
	<b>Final Assessment</b>	

Reference:

Step By Step Microsoft Office XP.(Microsoft Press).

Comptia A+ Certification 220-602 Comptia Press 2006 Objectives

CompTIA A+ Essentials &amp; CompTIA A+ 220-602

**Module Description** English Communication 1 is a module for level 1 students of specialization program, as part of the English communicative competence requirement for their diploma. The module is built around a communicative competency-based program that focuses on general English language skills and workplace competencies.

- Objectives**
- To help students build on and enhance EL proficiency achieved at level 4 of BSEL 406.
  - To help them achieve target language competencies required at work.
  - To help them learn and practice the same competencies for job success.

- Learning Outcomes** At the end of the course the students will be able to:
- Illustrate points and express preferences.
  - Listen to and speak about job safety and team work.
  - Participate effectively in meetings.
  - Tell about cause and effect.
  - Express disapproval, make counter-argument, conclude, compare and contrast statements

- Contents**
- Understanding Company Benefits
  - Employees' Rights
  - Job Safety
  - Teamwork
  - Meetings and Minutes
  - Tools and Supplies
  - Unions and Employment Contracts
  - Using Business Machines
  - Self-Employment

Prerequisite **BSEL 406**

Level **1**

Contact Hours: **24**

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
3	Understanding Company Benefits	Illustrating points and express preferences using appropriate words and phrases
3	Employees' Rights	Describing events chronologically and telling about past situations using past perfect tense
<b>Quiz 1</b>		
3	Job Safety	Predicting consequences using past simple present and past
3	Teamwork	Telling about tasks and predicting consequences using causative verbs
<b>Midterm</b>		
3	Meetings and Minutes	Expressing indifference and disapproval and indicating order and sequence using unreal conditional with 'would' and 'could'
3	Tools and Supplies & Unions and Employment Contracts	Persuading and explaining using 'could have', 'would have' and 'however'
<b>Quiz 2</b>		
3	Using Business Machines	Talking about the future and inferring using passive simple future
3	Self-employment	Concluding, comparing and contrasting using 'might have', 'as---as'.
<b>Final Examination</b>		

Reference: Put English to Work , Level 5 by Sandra Linn

**Module Description**

This module served as the basic foundation of computer. The student will learn the different components that make up the computer, including the case, motherboard, drives and storage devices, expansion cards and display devices. Also include the common peripheral ports and cables and their appearance. Finally the students will learn about various methods used for cooling a PC and their functions.

**Objectives**

The objectives of this module are:

- Identify the names, purposes and characteristics of storage devices, motherboards, powers supplies, processor/CPU, memory, display devices and other computer peripherals.
- Install, configure, optimize and upgrade personal computer components

**Learning Outcomes**

After completing this module the student will be able to:

- Know the types of system boards
- Know the components of motherboard
- Understand the purpose and characteristics of processor, memory, storage devices, power supply, display adapters, input devices, adapter cards and their ports and cables, cooling system.

**Contents**

- An Overview of System Components
- Knowing Your Motherboard
- Central Processing Unit (CPU)
- Memory
- Telling Your BIOS from Your CMOS
- Ports, Cables and Connectors
- Installing and Configuring Input Devices
- Installing and Configuring output Devices
- Adding and Removing System Components

Prerequisite —

Level 2

Contact Hours: 88

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
10	<b>An Overview of System Components</b>	Identify and Explain the computer parts
	What is a Computer Looking Inside a PC (Processor/CPU, Storage devices, Memory, System Boards, Power Supply, Adapter Cards, cooling system and fans, Firmware and chipsets, BIOS, CMOS)	
10	<b>Motherboard</b>	Identify and Explain the PC Motherboard
	What's on the motherboard	
	Types of motherboard Understanding Bus Architecture	
10	<b>Central Processing Unit (CPU)</b>	Identify and Explain the CPU
	Understanding Processor Terminology	
	Different kinds of Processor and Manufacturer Installing your Processor	
2	<b>Assessment 1</b>	
10	<b>Memory</b>	Identify and Explain the Memory
	Understanding about the types of Memory	
	Identifying the types of DRAM	
	Memory Packaging	
	Understanding about Error Checking Memory	
	Working with Cache Memory Installing or Upgrading Memory	
4	<b>Telling Your BIOS from Your CMOS</b>	Identify and Explain the BIOS & CMOS
	BIOS and Its Purpose	
	Upgrading System BIOS	
	Understanding CMOS	
	Viewing basic CMOS Setting Viewing advanced CMOS Setting	
8	<b>Ports, Cables and Connectors</b>	Identify and Explain the Ports, Cables and Connectors
	Identifying Common Computer Ports	
	Comparing Cable types	
	Cable Orientation	
	Connector Types	
	Standard External Cables	
	Viewing Cable Adapters Multimedia Connectors	
8	<b>Installing and Configuring Input Devices</b>	Install and Configure Input Devices
	Identifying Keyboards Types	
	Installing a Keyboard Installing and Configuring Modems and Adapters	
2	<b>Assessment 2</b>	

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
7	<b>Installing and Configuring Output Devices</b>	Install and Configure Output Devices
	Understanding Video adapters	
	Types of Monitor	
	The sound of Computer	
	Types of Sound Cards	
	Installing Sound Cards	
	Other output devices	
17	<b>Adding and Removing System Components</b>	Assemble and Disassemble PC
	System Modules	
	The Processor or CPU	
	The Power Supply	
	Memory	
	Storage Devices	
	The Monitor	
	Modems/ NIC	
	Peripherals	
	<b>Final Examination</b>	

Reference:

A+ Certification Study Guide by Syngress, A+ Certification Study Guide by Mike Meyers

A+ Certification for DUMMIES by Glen E. Clarke & Ed Tetz, A+ Certification Complete Study Guide by Sybex.

Prerequisite **ITMN 139**Level **2**Contact Hours: **64****Module Description**

This module served as the basic foundation of PC Troubleshooting. The student will learn the different tools, techniques and methods on how to repair computer as well as being familiar with common problem and solutions related to motherboard, hard disk, RAM, cooling fan and other major system components.

**Objectives**

The module objectives are:

- Identify tools, diagnostic procedures and troubleshooting techniques for personal computer component
- Perform preventive maintenance on personal computer components

**Learning Outcomes**

After completing this module the student will be able to:

- Proper use of tools in repairing PC
- Troubleshooting techniques
- Familiarization of common problems and solutions
- Preventive Maintenance

**Contents**

- Identifying Tools and Diagnostic for PC Components
- Basic Aspect of Troubleshooting
- Applying Basic Troubleshooting Techniques
- Performing Preventive Maintenance

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
7	<b>Identifying Tools and Diagnostic for PC Components</b>	Identifying Tools and Diagnostic for PC Components
	Gathering Tools	
	Hardware Tools	
8	<b>Basic Aspects of Troubleshooting</b>	Basic Aspect of Troubleshooting
	Basic Diagnosing Procedures	
	Recognizing and Isolating issues	
2	<b>Assessment 1</b>	
30	<b>Applying Basic Troubleshooting Techniques</b>	Ability to repair Computer related peripherals
	Identifying Motherboard And CPU Problems	
	Identifying I/O Ports and cables	
	Identifying Cooling Issues	
	Identifying Case Issues	
	Identifying hard Disk System Problems	
	Identifying Modem Problems	
	Identifying AT Commands	
	Identifying Keyboard and Mouse Problems	
	Identifying Display Device Problems	
	Identifying Floppy and other Disk-Drive Problems	
	Identifying Sound Cards Problems	
	Identifying CD ROM/DVD Issues	
	Identifying NIC Issues	
Identifying BIOS Issues		
Identifying Miscellaneous Problem		
2	<b>Assessment 2</b>	
15	<b>Performing Preventive Maintenance</b>	Perform Preventive Maintenance
	Preventive Maintenance Products and Procedures	
	Power Protection and Safety Procedures	
	Final Examination	

Reference:

A+ Certification Study Guide by Syngress, A+ Certification Study Guide by Mike Meyers

A+ Certification for DUMMIES by Glen E. Clarke & Ed Tetz, A+ Certification Complete Study Guide by Sybex.

Prerequisite —

Level 2

Contact Hours: 48

**Module Description**

In this module you will learn various issues about laptops. Including components that make up a laptop and how they differ in appearance and function from those desktop. Finally, basic troubleshooting and preventive maintenance.

**Objectives**

The objectives of this module are:

- Identify the fundamental principles of using laptops and portable devices
- Install, configure, optimize and upgrade laptops and portable devices
- Identify tools, basic diagnostic procedures and troubleshooting techniques for laptops and portable devices
- Perform preventive maintenance on laptops and portable devices

**Learning Outcomes**

After completing this module the student will be able to:

- Know the difference between laptop processor and desktop processor
- Understand the difference laptop memory standards and desktop processor
- Know the difference between laptop processor and desktop processor
- Understand key concepts behind LCD technology
- Know how laptops handle power management
- Know how to remove laptop-specific hardware

**Contents**

- Fundamental principle of laptops and other portable devices
- Software Installation and upgrading for laptop and portable devices
- Basic Troubleshooting
- Preventive Maintenance

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
12	<b>Fundamental principle of laptops and other portable devices</b>	Understand and Identify the parts of laptops & other portable devices
	Identify names, purpose and characteristics of laptop	
	Form factor such as memory and hard drive	
	Peripherals (docking station, port replicator & media access)	
	Expansion slot, Ports, Communication connection, Power & Electrical input devices, LCD technology and Input devices)	
2	<b>Assessment 1</b>	
12	<b>Software Installation and upgrading</b>	Install software & remove, modify laptops
	Power management configuration	
	Identification of BIOS-ACPI	
	Contrast between suspend and hibernate	
	Safe removal of laptop hardware components	
2	<b>Assessment 2</b>	
8	<b>Basic Troubleshooting</b>	Apply basic knowledge of preventive maintenance & troubleshooting
	Basic troubleshooting techniques	
	Proper removal of laptop parts	
	Unique laptop keypad issues	
	Antenna wires	
10	<b>Preventive Maintenance</b>	
	Understand and apply common preventive maintenance of laptops and portable devices such as cooling devices, hardware and video cleaning materials.	
	Operating environments: (factors like temperature, air quality. Storage temperature, transportation and shipping)	
2	Final Examination	

Reference:

A+ Certification Study Guide by Syngress, A+ Certification Study Guide by Mike Meyers

A+ Certification for DUMMIES by Glen E. Clarke & Ed Tetz, A+ Certification Complete Study Guide by Sybex

Prerequisite **ITMN 138**Level **2**Contact Hours: **40****Module Description**

This module provides students with the knowledge and skills to troubleshoot and escalate or repair problems with Windows desktop operating systems by reacting to incident requests from end users. This module will cover A+ Essential Operating system portion and provide the basic knowledge of system architecture and security needed to provide the students with the requisite skills required to support end users and adhere to MOF (Microsoft Operational Framework) foundational operations.

**Objectives**

The objectives of this module is to:

- Windows and concept of Information Technology hardware and software.
- Study system configuration issues and solve these issues
- Solve startup, printing, hardware and connectivity issues.
- Study role Desktop Support Technician.
- Enhance students' understanding of PC operation.

**Learning Outcomes**

After completing this module the student will be able to:

- Describe the role and key skills of an IT technician (220-602) and the different environments they work in.
- Identify and resolve system configuration and security issues.
- Identify and resolve hardware issues.
- Identify and resolve file and folder issues.
- Identify and resolve print issues.
- Identify and resolve startup issues.

**Contents**

- Windows 2000, Windows XP Professional, Home, Media Centre
- Install Configure, Optimize Operating System, Reference to Windows 95 and NT
- Tools, diagnostic procedures and troubleshooting techniques for operating systems
- Recognize and resolve common operational issues
- Perform preventive maintenance on operating systems

**Pacing Schedule**

Contact Hour	Contents	Skills Gained
10	<p><b>Windows 2000, Windows XP Professional, Home, Media Centre</b></p> <p>Operating system revision levels including GUI, system requirements, application and hardware compatibility Identify the names, locations, purposes and characteristics of operating system files along with basic troubleshooting BOOT.INI NTLDR NTDETECT.COM NTBOOTDD.SYS Registry data files</p>	Familiarization with Operating System version & Booting Failure Issues
	<p><b>Assessment 1</b></p>	
10	<p><b>Install Configure, Optimize Operating System, Reference to Windows 95 and NT</b></p> <p>Operating system installation options (e.g. attended / unattended, file system type, network configuration) Device driver configuration (e.g. install and upload device drivers) Verification of installation Upgrade considerations (e.g. hardware, application and / or network compatibility) Determine whether permissions are adequate for performing the task. Using unsigned drivers (e.g. driver signing) Identify procedures and utilities used to optimize operating systems for example, virtual Memory, hard drives, temporary files, service, startup and applications</p>	Optimizing & Upgrading Operating System
	<p><b>Tools, diagnostic procedures and troubleshooting techniques for</b></p> <p>Identify basic boot sequences, methods and utilities for recovering operating systems. Boot methods (e.g. safe mode, recovery console, boot to restore point) Automated System Recovery (ASR) (e.g. Emergency Repair Disk (ERD)) Identify and apply diagnostic procedures and troubleshooting techniques. Identify the problem by questioning the user and identifying user changes to the computer</p>	
6	<p><b>Assessment 2</b></p>	Familiarization to Recovery & Troubleshooting procedure

Prerequisite **ITMN 138**Level **2**Contact Hours: **40****Pacing Schedule**

Contact Hour	Contents	Skills Gained
10	<p><b>Recognize and resolve common operational issues</b></p> <p>Analyze problem including potential causes and initial determination of software and / or hardware problem. Test related components including connections, hardware / software configurations, device manager and consulting vendor documentation. Evaluate results and take additional steps if needed such as consultation, alternate resources and manuals. Bluescreen Errors, system lock-up Problems Input / output device Problems Application install, start or load and Windows-specific Problems Printing problems (e.g. print spool stalled, incorrect / incompatible driver for print) Explain common error messages and codes for example: Boot (e.g. invalid boot disk, inaccessible boot drive, missing NTLDR) Startup (e.g. device / service failed to start, device / program in registry not found) Event Viewer Registry Windows reporting</p>	Familiarization to Software & Hardware Compatibility Issues
	<p><b>Perform preventive maintenance on operating systems</b></p> <p>Describe common utilities for performing preventive maintenance on operating systems. Software and Windows updates Service packs Scheduled backups Restore, restore points.</p> <p><b>Final Assessment</b></p>	
4		Windows Advanced User Skills

Reference:

Comptia A+ Certification 220-602 Comptia Press 2006 Objectives

CompTIA A+ Essentials &amp; CompTIA A+ 220-602 Comptia Exam Guide

**Module Description**

English Communication 2 is a module for level 2 students of specialization program that builds on English Communication 1 as part of the communicative competence requirement for their diploma. The module is built around a communicative competency-based program that focuses on communication skills and workplace competencies.

**Objectives**

- To consolidate the students' communicative competence achieved at level 1 of the skill program.
- To develop language skills, document literacy, critical thinking and problem solving in workplace situations.
- To develop purposeful use of language in realistic contexts and communicative competence.

**Learning Outcomes**

At the end of the course the students will be able to:

- Check assumptions, express values and understand social systems
- Express wishes and confirming conjectures
- Summarize, bargain and predict things
- Analyze and express values and judgments, negotiate and talk about causes and effects.

**Contents**

- Career Planning and Self-Assessment
- Taxes and Tax Forma
- Rights, Responsibilities and Benefits.
- Performance Reviews
- Health Problems on the Job
- Emergency Procedures
- Scheduling and Budgeting
- Using Computers
- Job Promotions

Prerequisite **ENGC 102**

Level **2**

Contact Hours: **24**

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
3	Career Planning and Self-Assessment	Checking assumptions, expressing values and analyzing using tag questions and appropriate noun clauses
3	Taxes and Tax forms	Paraphrasing and confirming conjectures using past subjunctive and direct speech
<b>Quiz 1</b>		
3	Rights and Responsibilities	Summarizing, bargaining and predicting using future perfect and future conditional
3	Performance Reviews	Reporting information and complimenting using passive simple future and passive present perfect
<b>Midterm</b>		
3	Health Problems on the Job	Predicting and analyzing using future perfect continuous.
3	Emergency Procedures	Expressing values, requesting information and predicting consequences using present continuous conditional and embedded questions.
<b>Quiz 2</b>		
3	Scheduling and Budgeting	Compromising and negotiating using clauses with 'although' and 'unless'.
3	Using Computers and Job Promotions	Talking about possibility, cause and effect and expressing judgment using causative and past unreal conditional
<b>Final Examination</b>		

Reference: Put English to Work – Level 6 by Sally Gearhart

## Module Description

Interpersonal Communication Students will develop skills on Communicating with Co-Workers, Communicating to Build a Positive Culture, and giving feedback when building relationships. The program also describes the various communication styles and offers techniques to use when communicating with users and customers.

## Objectives

- Students will learn how to communicate in a professional environment
- They will learn how to manage day to day business
- They will learn how to build successful business presentations and deliver ideas in an effective manner
- Students will learn how to manage anger, conflicts, and how to participate in creating a good working atmosphere

## Learning Outcomes

- Develop personal communication skills
- Emphasizing on the relations between technical support team and users
- Develop skills needed to concentrate on market needs

## Contents

- Anger Management in the Workplace
- Assertive Communication
- Building Better Work Relationships
- Business Etiquette and Professionalism
- Business Grammar Essentials
- Business Writing Essentials
- Dealing with Conflict in the Workplace
- Delivering Successful Presentations
- Effective Business Meetings
- Effective Listening Skills
- Anger Management in the Workplace
- Assertive Communication
- Building Better Work Relationships

Prerequisite —

Level 3

Contact Hours: 32

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
1	<b>Introduction to Interpersonal communication</b>	The Philosophy of Communication Skills
	Introduction	
	Definitions	
	Course walk through	
1	<b>Anger Management in the Workplace</b>	How to express and manage anger at work
	Experiencing Anger	
	Managing Your Anger	
	Managing Anger in the Workplace Simulation	
2	<b>Assertive Communication</b>	Principles of Assertive communication
	Professional Assertiveness	
	Assertiveness from the Inside Out	
	Assertive Communication Simulation	
3	<b>Building Better Work Relationships</b>	The ability to build a good working atmosphere Gentle communications basics with customers and co-workers Avoiding hassles and building trust relationships in business
	Building Effective Interfunctional Relationships	
	Building Effective Intercultural Relationships	
	Building Effective Intergender Relationships	
	Working Effectively with Customers	
	Working Effectively with Business Partners	
	Building Better Work Relationships Simulation	
3	<b>Business Etiquette and Professionalism</b>	
	Everyday Business Etiquette	
	Communication Etiquette	
	Etiquette and the Business Meeting	
	Etiquette for Supervisors	
	Business Etiquette and Professionalism Simulation	
1	<b>Assessment 1</b>	
4	<b>Business Grammar Essentials</b>	Building the professional Language knowledge and skills needed at work. Developing good correspondence. Effective Professional English writing
	Foundations of Grammar	
	Sentence Construction	
	Understanding Writing Mechanics	
	Punctuating with Skill	
4	<b>Business Writing Essentials</b>	
	Writing with Intention	
	Avoiding Errors in Usage and Punctuation	
	Avoiding Grammatical Errors in Business Writing	
	Crisp Composition	
	Writing to Reach the Audience	
	Getting the Most from Business Documents	
The Writing Process		

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
2	<b>Effective Listening Skills</b>	
	The Basics of Listening	
	Building Better Work Relationships Simulation	
1	<b>Assessment 2</b>	
3	<b>Dealing with Conflict in the Workplace</b>	Conflict handling
	Perspectives on Conflict	
	Handling Conflict with Others	
	Managing Conflict in the Organization	
	Dealing with Conflict in the Workplace Simulation	
	Managing Conflict in the Workplace Simulation	
3	<b>Delivering Successful Presentations</b>	Presentation skills – how to present ideas, plans, demos, .. etc.
	Presenting to Succeed	
	Delivering Your Message	
	Presentation Resources Available to You	
	Delivering Successful Presentations Simulation	
2	<b>Effective Business Meetings</b>	Meeting preparations How to participate and lead a meeting
	Planning Effective Business Meetings	
	Leading Effective Business Meetings	
	Participating Effectively in Business Meetings	
	Effective Business Meetings Simulation	
2	<b>Final Assessment</b>	

Reference:

Interpersonal communication , Sarah Trenholm, Arthur Jensen

Prerequisite —

Level 3

Contact Hours: 144

**Module Description**

This module presents a comprehensive overview of networking; from fundamentals to advanced Applications and services. It is based on the top-down approach to networking. The module emphasizes are on skills required to design networks, while providing opportunities for practical application and hands-on experience by teaching students how to install, operate, and maintain networks.

**Objectives**

The objectives of the module are:

- Provides students with the skills needed to succeed in networking-related programs
- Helps them prepare for CCENT and A+ certification.
- Helps students develop the skills necessary to fulfill the job responsibilities of network technicians.
- It provides a theoretically-rich, hands-on introduction to networking and the Internet.

**Learning Outcomes**

After completing this module the student will be able to:

- Explain the importance of data networks and the Internet in supporting business communications
- Explain how communication works in data networks and the Internet
- Describe the protocols & services provided by the Application layer in the OSI models.
- Analyze the operations and features of the Transport layer protocols
- Analyze the operations of the Network layer protocols and services and explain the fundamental concepts of routing
- Describe the operation of protocols at the OSI Data link layer and explain how they support communications.
- Explain the role of Physical layer protocols and services in supporting communications across data networks
- Explain fundamental Ethernet concepts such as media, services, and operation.
- Install and configure network cards
- Employ basic cabling and network designs to connect devices in accordance with stated objectives.
- Troubleshoot network problems.
- Use Cisco CLI commands to perform basic router and switch configuration and verification.

**Contents**

- Living in a Network-Centric World
- Communications over the Networks
- OSI Models
- Ethernet
- Install, configure, optimize and upgrade networks
- Planning and Cabling Network
- Use tools and diagnostic procedures to troubleshoot network problems
- Configuring and Testing Your Network

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
9	<b>Living in a Network-Centric World</b>	Explain the importance of data networks and the Internet in supporting business communications
	Communicating in a Network-Centric World	
	Communication – An Essential Part of Our Lives	
	The Network as a Platform	
	The Architecture of the Internet	
22	Trends in Networking	Explain how communication works in data networks and the Internet
	<b>Communications over the Networks</b>	
	The Platform for Communications	
	Using Layered Models	
	Describe basic networking concepts	
	Addressing, Bandwidth	
	Protocols & Terminologies (e.g. TCP / IP including IP, classful subnet, IPX / SPX including NWLINK, NETBEUI / NETBIOS, ISP, SMTP, IMAP, HTML, HTTP, HTTPS, SSL, Telnet, FTP & DNS)	
Identify names, purposes and characteristics of technologies for establishing connectivity ( e.g. LANs, WANs, ISDN, Broadband (e.g. DSL, cable, satellite), Dial-up, Wireless, Infrared, Bluetooth, Cellular, VoIP and Internetworks)		
8	Full-duplex, half-duplex and simplex	Describe the protocols & services provided by the Application layer in the OSI models
	<b>OSI Application Layer Functionality</b>	
	Applications – The Interface Between the Networks	
	Making Provisions for Applications and Services	
7	Application Layer Protocols and Services Examples	Analyze the operations and features of the Transport layer protocols
	<b>OSI Transport Layer</b>	
	Roles of the Transport Layer	
	The TCP Protocol – Communicating with Reliability	
	Managing TCP Sessions	
12	The UDP Protocol – Communicating with Low Overhead	Analyze the operations of the Network layer protocols and services and explain the fundamental concepts of routing
	<b>Assessment 1</b>	
	<b>OSI Network Layer</b>	
	IPv4	
	Networks – Dividing Devices into Groups	
12	Routing – How Our Data Packets are Handled	Describe the operation of protocols at the OSI Data link layer and explain how they support communications
	Routing Processes: How Routes are Learned	
	Lab Activity	
	<b>Data Link Layer</b>	
	Data Link Layer – Accessing the media	
12	Media Access Control Techniques	Describe the operation of protocols at the OSI Data link layer and explain how they support communications
	Media Access Control Addressing and Framing Data	
	Putting it All Together	
	Lab Activity	

Prerequisite —

Level 3

Contact Hours: 144

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
12	<b>OSI Physical Layer</b>	Explain the role of Physical layer
	The Physical Layer - Communication Signals	
	Physical Signaling and Encoding: Representing	protocols and services in supporting communications across data networks
	Physical Media-Connecting Communication, Connectors	
	Cabling (e.g. twisted pair, coaxial cable, fiber optic, RS-232, USB, IEEE 1394 / Firewire)	
	Identify names, purposes and characteristics of the common network cables (UTP,STP & Fiber)	
	Lab Activity	
10	<b>Ethernet</b>	Explain fundamental Ethernet concepts such as media, services, and operation
	Overview of Ethernet	
	Ethernet - Communication through the LAN	
	The Ethernet Frame	
	Ethernet Media Access Control	
	Ethernet Physical Layer	
	Hubs and Switches	
	Address Resolution Protocol (ARP)	
Lab Activity		
2	<b>Assessment 2</b>	
12	<b>Install, configure, optimize and upgrade networks</b>	Install and configure network cards
	Install and configure browsers	
	Install and configure network cards (physical address)	
	Install, identify and obtain wired and wireless connection	
	Establish network connectivity	
	Networking models including peer-to-peer and client / server	
	Demonstrate the ability to share network resources	
12	<b>Planning and Cabling Networks</b>	Employ basic cabling and network designs to connect devices in accordance with stated objectives
	LANs – Making the Physical Connection	
	Device Interconnections	
	Developing an Addressing Scheme	
	Calculating the Subnets	
Lab Activity		
12	<b>Use tools and diagnostic procedures to troubleshoot network problems</b>	Troubleshoot network problems
	Identify names, purposes and characteristics of tools (e.g. Command line tools (e.g. IPCONFIG, PING, TRACERT, NS-LOOKUP.EXE) & Cable testing device	
	Diagnose and troubleshoot basic network issue (e.g. Driver / network interface, Protocol configuration (e.g. TCP / IP (e.g. gateway, subnet mask, DNS, WINS, static and automatic address assignment) and IPX / SPX (NWLink)), Permissions and Firewall configuration	

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
10	<b>Configuring and Testing Your Network</b>	Use Cisco CLI commands to perform basic router and switch configuration and verification
	Configuring Cisco Devices – IOSR basics	
	Applying a Basic Configuration Using Cisco IOS	
	Verifying Connectivity	
	Monitoring and Documenting of Networks	
	Lab Activity	
2	<b>Final Assessment</b>	

Reference:

CCNA 1&2, CCNA 1&2 Lab Manual by: CISCO, How Networks Work By: QUE, A+ Certification Books By: Sybex, Michael Mayer

Prerequisite —

Level **3**Contact Hours: **32**

**Module Description** This module explains various procedures and techniques to configure and troubleshoot security settings to maximize the protection of confidential company information.

**Objectives** The objective of this module is to discuss the security options for a computer network, Describe the methods used to secure company data, Install and configure security settings.

**Learning Outcomes** After completing the module students will be able:

- To become a CompTIA IT Technician.
- Support PC hardware in a business setting, including installation, troubleshooting, and component replacement.
- Responsible for maintaining PCs in their workplace.

**Contents**

- Fundamental Principles of Security
- Install, configure, upgrade and optimize security
- Procedures and troubleshooting techniques for security
- Perform preventive maintenance for computer security

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
7	<b>Fundamental Principles of Security</b>	Secure Hardware & Software
	Characteristics of hardware and software security	
	Purposes and characteristics of wireless security	
	Purposes and characteristics of data and physical security	
	Describe importance and process of incident reporting	
6	<b>Install, configure, upgrade and optimize security</b>	Security Optimization
	Authentication technologies	
	Malicious software protection	
	Data access (basic local security policy)	
	Backup procedures and access to backups	
	Data migration	
	<b>Assessment 1</b>	
11	<b>Procedures and troubleshooting techniques for security</b>	Troubleshooting Techniques
	BIOS	
	Smart cards, biometrics	
	Authentication technologies	
	Malicious software	
	File system (e.g. FAT32, NTFS)	
	Data access (e.g. basic local security policy)	
	Backup	
	<b>Assessment 2</b>	
8	<b>Perform preventive maintenance for computer security</b>	Maintaining security
	Implement software security preventive	
	Maintenance techniques	
	Installing service packs and patches	
	<b>Assessment 3</b>	

Reference:

A+ Certification All-in-One Desk Reference for Dummies by Glen E. Clarke.

Prerequisite —

Level **3**Contact Hours: **32**

**Module Description** This course deals with the metal conductors and connectors, fiber optics and wireless networks. It describes the importance of backbone.

**Objectives** The objectives of this module are:

- Provides students enough knowledge about coaxial cable and fiber optics
- Helps them to familiarize about backbone.
- It provides knowledge about wireless networks.

**Learning Outcomes** After completing this course the student will be able to:

- Install Coaxial Cables
- Know the importance of backbone
- Understand the Importance of Wireless Network.

**Contents**

- Metal Conductors and Connectors
- Fiber Cables
- Wireless Networks

### Pacing Schedule

Contact Hours	Contents	Skills Gained
11	<b>Metal Conductors and Connectors</b>	Install Coaxial Cables
	Coaxial Cable Parameters and Testing	
	Installing Metal Cables in New and Existing Facilities	
	<b>Assessment 1</b>	
10	<b>Fiber Cables</b>	Know the Importance of Backbone
	Use of Backbone Fiber	
	Installing Fiber Cables in New and Existing Facilities	
1.5	<b>Assessment 2</b>	
8	<b>Wireless Networks</b>	Understand the Importance of Wireless Network
	Issues, Problems, Types and Characteristics	
	Wireless Applications	
1.5	<b>Final Assessment</b>	

Reference:  
CCNA 1&2, CCNA 1&2 Lab Manual by: CISCO, How Networks Work By: QUE

**Module Description** Technical Report Writing 1, is offered to students to improve their English language proficiency in writing short technical reports which is part of their diploma requirement. The module integrates different methods of report writing with the basic mechanics organized writing.

- Objectives**
- To consolidate and extend the writing skills they have learned in ENGC 203.
  - To help technical student write short reports involving technical expression.

- Learning Outcomes** After completing this module the student will be able to:
- use writing as a means of communication in work environments
  - write short reports involving technical expression
  - organize information using the mechanics of writing

- Contents**
- Introduction to Technical Report Writing
  - Precaution Instructions
  - Operational Instructions
  - Progress Reports
  - Accident Reports
  - Industrial Visit Reports

### Pacing Schedule

Contact Hours	Contents	Skills Gained
3	Introduction to Technical Report Writing	Learning the basics of paragraph writing
3	Precaution Instructions	Sequencing precautionary instructions following the rules of writing
<b>Quiz 1</b>		
4	Operational Instructions	Writing operational instructions using the imperative form of verb
<b>Midterm</b>		
5	Progress Reports	Ability to write reports on jobs completed and not completed using present perfect and past simple verb forms
<b>Quiz 2</b>		
5	Accident Reports	Writing short reports on causes and consequences of accidents using past tense verb forms
4	Industrial Visit Reports	Reporting industrial visit experiences using past tense verb forms
<b>Final Examination</b>		

Reference: Technical Report Writing 1 (In-house made)

Prerequisite —

Level 4

Contact Hours: 160

**Module Description**

Routing is the second part of CCNA courses leading to the CISCO Certified Network Associate (CCNA) designation. It focuses on initial router configuration, CISCO IOS Software management. Configure routing protocol on routers, and set the access lists to control the access to routers. Also focuses TCP/IP configuration and design, access control lists (ACLs), and configure a router, manage CISCO IOS Software, Manage and implement CISCO networks.

**Objectives**

The objectives of the Module are:

- Install and configure CISCO switches and routers in multiprotocol inter-networks using LAN and WAN interfaces
- Provide Level 1 troubleshooting service
- Improve network performance and security
- Perform entry-level tasks in the planning, design, installation, operation, and troubleshooting of Ethernet and TCP/IP Networks

**Learning Outcomes**

After completing this module the student will understand and do :

- develop skills on how to configure and implement Router
- Routers and their roles in WANs
- CISCO IOS
- Router configuration
- Router file management
- RIP and IGRP routing protocols
- TCP/IP error and control messages
- Router troubleshooting
- Intermediate TCP
- Access control lists

**Contents**

- Introduction to Routers
- Configuring a Router
- Learning about Other Devices
- Managing CISCO IOS Software
- Routing and Routing Protocols
- Distance Vector Routing Protocols
- TCP/IP Suite Error and Control Messages
- Basic Router Troubleshooting
- Intermediate TCP/IP
- Access Control Lists (ACLs)
- Case Study

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
8	<b>Introduction to Routers</b>	Starting CISCO Router
	Operating CISCO IOS Software	
	The purpose of CISCO IOS software	
	Router user interface	
	Router user interface modes	
	CISCO IOS software features	
	Operation of CISCO IOS software	
	Starting a Router	
	Initial startup of CISCO routers, Router LED indicators, The initial router bootup	
	Establish a console session, Router login, Keyboard help in the router CLI	
	Enhanced editing commands, Router command history, Troubleshooting command line errors	
The show version command		
10	<b>Configuring a Router</b>	Configuring CISCO Router
	Configuring a Router	
	CLI command modes, Configuring a router name	
	Configuring router passwords	
	Examining the show commands	
	Configuring a serial interface	
	Making configuration changes	
	Configuring an Ethernet interface	
	Finishing the configuration	
	Importance of configuration standards	
	Interface descriptions, Configuring interface description	
	Login banners, Configuring message-of-the-day (MOTD)	
	Host name resolution, Configuring host tables	
	Configuration backup and documentation, Backing up configuration files	
Review		

Prerequisite —

Level 4

Contact Hours: 160

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
8	<b>Learning about Other Devices</b>	Using CISCO Discovery Protocol
	Discovering and Connecting to Neighbors	
	Introduction to CDP	
	Information obtained with CDP, Implementation, monitoring, and maintenance of CDP	
	Creating a network map of the environment	
	Disabling CDP, Troubleshooting CDP	
	Getting Information about Remote Devices	
	Telnet	
	Establishing and verifying a Telnet connection, Disconnecting and suspending Telnet sessions	
	Advanced Telnet operation, Alternate connectivity tests	
	Troubleshooting IP address issues	
16	<b>Managing CISCO IOS Software</b>	Troubleshooting IOS Boot Failure
	Router Boot Sequence and Verification	
	Stages of the router power-on boot sequence	
	How a CISCO device locates and loads IOS	
	Using the boot system command	
	Configuration register	
	Troubleshooting IOS boot failure	
	Managing the CISCO File System	
	IOS file system overview	
	IOS naming conventions	
	Managing configuration files using TFTP, Managing configuration file using copy-and-paste	
	Managing IOS images using TFTP, Managing IOS images using Xmodem	
	Environmental variables, File system verification	
	Review	
Review Exercises		
Review		

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
12	<b>Routing and Routing Protocols</b>	Configuring Routing Protocols
	Introduction to Static Routing	
	Introducing routing	
	Static route operation	
	Configuring static routes	
	Configuring default route forwarding	
	Verifying static route configuration	
	Troubleshooting static route configuration	
	Dynamic Routing Overview	
	Introduction to routing protocols	
	Autonomous systems	
	Purpose of a routing protocol and autonomous systems	
	Identifying the classes of routing protocols	
	Distance vector routing protocol features and examples	
	Link-state routing protocol features and examples	
	Introduction to routing protocols	
	Routing Protocols Overview	
	Path determination	
	Routing configuration	
Routing protocols		
IGP versus EGP		
2	<b>Assessment 1</b>	
24	<b>Distance Vector Routing Protocols</b>	Configuring Distance Vector Routing Protocols
	Distance vector routing updates	
	Distance vector routing loop issues	
	Defining a maximum count	
	Eliminating routing loops through split horizon	
	Route poisoning	
	Avoiding routing loops with triggered updates	
	Preventing routing loops with hold-down timers	
	RIP routing process	
	Configuring RIP	

Prerequisite —

Level 4

Contact Hours: 160

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
	<b>Using the ip classless command</b>	
	Common RIP configuration issues	
	Verifying RIP configuration	
	Troubleshooting RIP update issues	
	Preventing routing updates through an interface	
	Load balancing with RIP	
	Load balancing across multiple paths	
	Integrating static routes with RIP	
	<b>IGRP</b>	
	IGRP features	
	IGRP metrics	
	IGRP routes	
	IGRP stability features	
	Configuring IGRP	
	Migrating RIP to IGRP	
	Verifying IGRP configuration	
	Troubleshooting IGRP	
	IGRP features	
	<b>TCP/IP Suite Error and Control Messages</b>	
	Overview of TCP/IP Error Message	
	ICMP	
	Error reporting and error correction	
	ICMP message delivery	
	Unreachable networks	
	Using ping to test destination reachability	
	Detecting excessively long routes	
	Echo messages	
	Destination unreachable message	
	Miscellaneous error reporting	
	TCP/IP Suite Control Messages	
	Introduction to control messages	
	ICMP redirect/change requests	
	Clock synchronization and transit time estimation	
	Information requests and reply message formats	
	Address mask requirements	
	Router discovery message	
	Router solicitation message	
	Congestion and flow control messages	
22		Understanding TCP/ IP Suite Error and Control Messages
2	<b>Assessment 2</b>	

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
20	<b>Basic Router Troubleshooting</b>	Router Troubleshooting
	Examining the Routing Table	
	The show ip route command	
	Determining the gateway of last resort	
	Determining the route source and destination	
	Determining L2 and L3 addresses	
	Determining the route administrative distance	
	Determining the route metric	
	Determining the route next hop	
	Determining the last route update	
	Observe multiple paths to destination	
	Network Testing	
	Introduction to network testing	
	Using a structured approach to troubleshooting	
	Testing by OSI layers	
	Layer 1 troubleshooting using indicators	
	Layer 3 troubleshooting using ping	
	Layer 7 troubleshooting using Telnet	
	Troubleshooting Router Issues Overview	
	Troubleshooting Layer 1 using show interface	
Troubleshooting Layer 2 using show interface		
Troubleshooting using show cdp		
Troubleshooting using traceroute		
Troubleshooting routing issues		
Troubleshooting using show controllers serial		
Introduction to debug		
14	<b>Intermediate TCP/IP</b>	Understanding TCP/IP Operation
	TCP Operation	
	TCP operation	
	Synchronization process or 3-way handshake	
	Denial-of-service attacks	
	Windowing and window size	
	Sequencing numbers	
	Positive ACK	
Overview of Transport Layer Ports		

Prerequisite —

Level 4

Contact Hours: 160

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
	Multiple conversations between hosts	
	Ports for services	
	Ports for clients	
	Port numbering and well known ports numbers	
	Example of multiple sessions between hosts	
	Comparison of MAC addresses, IP addresses, and port numbers	
20	<b>Access Control Lists (ACLs)</b>	Creating Access Control List
	Access Control List Fundamentals	
	Introduction ACLs	
	How ACLs work	
	11.1.3 Creating ACLs	
	11.1.4 The function of a wildcard mask	
	11.1.5 Verifying ACLs	
	Access Control Lists (ACLs)	
	Standard ACLs	
	Extended ACLs	
	Named ACLs	
	Placing ACLs	
	Firewalls	
	Restricting virtual terminal access	
	Case Study	Design Network Scenario
Overview Case Study		
Implementing Case Study		
2	<b>Final Assessment</b>	

Reference:

CISCO networking academy program CCNA 2

**Module Description**

This course deals with study of network design process, user requirements, Application requirements, computing platform and network requirement, analyzing the network, logical network design and physical network design. It describes the importance of TCP/IP addressing, security consideration, structured cabling and fiber optics. It also includes network project presentation.

**Objectives**

The objectives of the module are:

- Know proper procedure and requirements in network design.
- How to make a design.
- How to implement the design.
- Know difference between the logical and physical network design.

**Learning Outcomes**

After completing this course the student will be able:

- To make a design as well as know the proper implementation and presentation.
- To differentiate the difference between logical and physical network design.
- To know how to compute IP addressing and their importance.

**Contents**

- The Network Design Process
- Analyzing the Network
- Logical Network Design
- Physical Network Design
- Network Project Presentation

Prerequisite —

Level 4

Contact Hours: 80

**Pacing Schedule**

Contact Hours	Contents	Skills Gained
23	<b>The Network Design Process</b>	Describe the Network Design Process and Requirements
	User Requirements	
	Application Requirements	
	Computing Platform	
	Network Requirements	
	Developing a Requirements Specification Document	
2	<b>Assessment 1</b>	
12	<b>Analyzing the Network</b>	Analyze the Network Traffic and Knows some Specification
	Network Performance Concepts	
	Estimating Traffic Volumes and Patterns	
	Developing a traffic Specification Document	
17	<b>Logical Network Design</b>	Knows how to Compute TCP/IP Addressing
	TCP/IP Addressing Consideration	
	Security Consideration	
	Developing a Logical Design Document	
	<b>Assessment 2</b>	
18	<b>Physical Network Design</b>	Knows how to Make Physical Network Design
	Overview of Structured Cabling	
	Fiber Optics Cables	
	Wireless Local Area Network	
	Developing a Physical Design Document	
6	<b>Network Project Presentation</b>	Develop a Design and Knows the Proper Presentation
	Presentation of Documents	
	Inspection of Network Components	
	Evaluation of Network Design	
2	<b>Final Assessment</b>	

Reference:

CCNA 1&amp;2, CCNA 1&amp;2 Lab Manual by: CISCO, How Networks Work By: QUE

**Module Description** Technical Report Writing 2, is offered to students to enhance and build on their proficiency in writing short technical reports which they learnt at level 3. The module integrates less- controlled methods of report writing with practicing the skill of filling out various forms required at workplace.

- Objectives**
- To consolidate and extend the report writing skills they have learned in TRWT 304.
  - To help technical student write resumes, more work related reports, and fill out forms involving technical and general vocabulary.

- Learning Outcomes** After completing this module the student will be able to:
- use writing as a means of communication in work environments
  - fill out forms and write short reports involving technical expression
  - write resumes and work related reports

- Contents**
- Making Descriptive Requisitions
  - Curriculum Vitae
  - Letter Writing
  - Cooperative Training Report
  - Filling out Requisition Forms
  - Filling Work -Related and General Forms

### Pacing Schedule

Contact Hours	Contents	Skills Gained
4	Making Descriptive Requisitions	Making official requests in writing for materials needed at work.
3	Curriculum Vitae	Writing CV's in response to job ads
<b>Quiz 1</b>		
4	Letter Writing	Writing formal cover letters for different jobs
<b>Midterm</b>		
4	Cooperative Training Report	Writing relevant reports on cooperative training to department heads
<b>Quiz 2</b>		
5	Filling out Requisition Forms	Ability to make different requisitions by filling out specific forms
4	Filling out Work-related and General Forms	Ability to fill out different forms - an ability required in real life situations
<b>Final Examination</b>		

Reference: Technical Report Writing 2 (In-house made)