THE INDEPENDENT
INSTITUTE OF
EDUCATION

Computer Architecture
COAR5111/d/p
MODULE OUTLINE 2024
(First Edition: 2016)

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Introduction

In the module computer architecture, you will explore the components of the desktop and laptop computer. You will learn how to protect yourself and the equipment.

It is important that the hardware components and concepts are mastered and that you spend sufficient time with your lecturer unpacking and exploring the fundamental concepts of computer architecture. This builds the rest of the PC technician knowledge-base required to tackle advanced problems that are related to hardware components such as hard drives, processors, and motherboards. In this module you also learn how to install and configure motherboards, central processing units (CPUS), and add-on cards.

You are encouraged to complete all class activities and provide adequate support during the practical implementation of the theory. Emphasise the logic employed especially the 'why' you should implement your knowledge as expected in the application activities in order to become a competent IT professional.

The specific topic that will be covered on this module computer architecture are:

- Taking a Computer Apart and Putting It Back Together.
- All about motherboards.
- Supporting processor and upgrading memory.
- Power supply and troubleshooting computer problems.
- Supporting hard drives and other storage devices.
- Supporting I/O devices.
- Supporting mobile devices.
- Supporting Printers.

Using this Module Outline

This module outline has been developed to **support your learning**.
Please note that the content of this module is on Learn as well as in the prescribed material.
You will not succeed in this module if you focus on this document alone.

- This document does not reflect all the content on Learn, the links to different resources, nor the specific instructions for the group and individual activities.
- Your lecturer will decide when activities are available/open for submission and when these submissions or contributions are due. Ensure that you take note of announcements made during lectures and/or posted within Learn in this regard.

This Module on Learn

Learn is an online space, designed to support and maximise your learning in an active manner. Its main purpose is to **guide and pace** you through the module. In addition to the information provided in this document, you will find the following when you access Learn:

- A list of prescribed material;
- A variety of additional online resources (articles, videos, audio, interactive graphics, etc.) in each learning unit that will further help to explain theoretical concepts;
- Critical questions to guide you through the module's objectives;
- Collaborative and individual activities (all of which are gradable) with time-on-task estimates to assist you in managing your time around these activities;
- Revision questions, or references to revision questions, after each learning unit.

Kindly note:

- Unless you are completing this as a distance module, Learn does **not** replace your contact time with your lecturers and/or tutors.
- **COAR5111** is a Learn module, and as such, you are required to engage extensively with the content on the Learn platform. Effective use of this tool will provide you with opportunities to discuss, debate, and consolidate your understanding of the content presented in this module.
- You are expected to work through the learning units on Learn in your own time – especially before class.
  Any contact sessions will therefore be used to raise and address any questions or interesting points with your lecturer, and **not** to cover every aspect of this module.
- Your lecturer will communicate **submission dates** for specific activities in class and/or on Learn.

Icons Used in this Document and on Learn

The following icons are used in all your modules on Learn:

Icon	Description
Objectives	A list of what you should be able to do after working through the learning unit.
Prescribed Work	Specific references to sections in the prescribed work.
ThinkAbout	Questions to help you recognise or think about theoretical concepts to be covered.
Active Learning	Sections where you get to grapple with the content/ theory. This is mainly presented in the form of questions which focus your attention and are aimed at helping you to understand the content better. You will be presented with online resources to work through (in addition to the textbook or manual references) and find some of the answers to the questions posed.
Connect the dots	Opportunities to make connections between different chunks of theory in the module or to real life.
That is life!	Real life or world of work information or examples of application of theory, using online resources for self-exploration.
REMEMBER: You need to log onto Learn to: • Access online resources such as articles, interactive graphics, explanations, video clips, etc. which will assist you in mastering the content; and • View instructions and submit or post your contributions to individual or group activities which are managed and tracked on Learn.	

Module Resources	
Prescribed Material (PM) for this Module	Jean Andrews, Ph.D. Joy Dark Shelton. and Nicholas Pierce. 2022. CompTIA A+ Guide to IT Technical Support. 11th Edition. ISBN: 978-0-357-67416-1
Recommended Readings, Digital, and Web Resources	Please note that a number of additional resources and links to resources are provided throughout this module on the Learn platform. You are encouraged to engage with these as they will assist you in mastering the various objectives of this module. They may also be useful resources for completing any assignments. You will not, however, be assessed under examination conditions on any additional or recommended reading material.
Module Overview	You will find an overview of this module on Learn under the *Module Information* link in the Course Menu.
Assessments	Find more information on this module's assessments in this document and on the Student Portal.

Module Purpose

The purpose of this module is to provide students with the foundational knowledge of the hardware aspects of a computer system. The module explores the services and practices involved in working with operating systems, applying troubleshooting techniques and the implementation of security measures on a computer system.

Module Outcomes

MO1	Demonstrate an understanding of key concepts of hardware components and peripherals in a desktop computer and the laptop.
MO2	Apply maintenance and troubleshooting techniques on hardware components and peripherals in a desktop computer and the laptop.
MO3	Explore I/O devices that can be connected on a desktop and laptop computer such as printers.
MO4	Demonstrate a sold understanding of support for mobile devices.

Assessments

Integrated Curriculum Engagement (ICE)	
Minimum number of ICE activities to complete	4
Weighting towards the final module mark	10%

Assignments/ Projects	Assignment 1
Weighting	25%
Total marks	100
Duration	10 hours
Period	3
Resources required	Refer to the Assignment for this information.

Tests/ Examination	Assignment 2	Summative Assignment
Weighting	30%	35%
Duration	10 hours	15 hours
Total marks	100	100
Open/ closed book	Theory Open book	Theory Open book
Period	4	ALL

Assessment Preparation Guidelines

	Format of the Assessment *(The Focus/ Approach/ Objectives)*	Preparation Hints *(How to Prepare, Resources to Use, etc.)*
Assignment	Refer to the assignment for this information.	Refer to the assignment for this information.

Module Pacer			
Code	Programme	Contact Sessions	Credits
COAR5111	DMT1, DNM1, HSU1	48	
COAR5111p	HSU1p	36	15
COAR5111d	HSU1d; DMT1d	36 + 12 learn	
Learning Unit 1	Building a Computer System		

Overview:

In this learning unit, you will learn how to take apart and reassemble a desktop computer and laptop while discovering the various hardware components inside the cases. You also learn about the tools you need to work with inside the case.

In this learning unit you will also learn how to protect yourself and the equipment so as to have a positive experience working inside a computer or laptop.

Learning Unit 1: Building a Computer System		Prescribed Material (PM)
COAR5111 Sessions: 1-10	Theme 1: Taking a computer apart and putting it back together	
	LO1: Disassemble and reassemble a desktop computer or safely.	PM: Chapter 1
COAR5111d Sessions: 1-7	LO2: Identify external ports and major components inside a desktop.	
COAR5111p Sessions: 1–7	LO3: Describe how external ports and major components connect and are compatible.	
Academic Week: 1-2	LO4: Identify various tools one need as a computer hardware technician.	
Related Outcomes: MO01 MO02	LO5: Disassemble and reassemble a laptop computer safely. LO6: Identify various external ports and slots and major internal components. LO7: Identify special concerns when supporting and maintaining laptop.	

Learning Unit 2	Case Components
Overview: In this learning unit we need to build on the knowledge from taking the computer apart and putting the components back together again. We will explore the components of the system unit which are the motherboard, processor, and power supply. We will also learn how to upgrade memory and troubleshoot computer problems.	

Learning Unit 2: Case Components		Prescribed Material (PM)
COAR5111 Sessions: 11–21	Theme 1: All about motherboards	
COAR5111d Sessions: 8-15	LO1: Describe various types and features of motherboards. LO2: Configure a motherboard using BIOS/UEFI firmware. LO3: Maintain a motherboard by updating drivers and firmware, using jumpers to clear BIOS/UEFI settings, and replacing the CMOS battery. LO4: Select, install, and replace a desktop motherboard.	PM: Chapter 2
COAR5111p Sessions: 8–15		
Academic Week: 3-5		
Related Outcomes: MO01 MO02	Theme 2: Supporting processors and upgrading memory	PM: Chapter 3
	LO5: Compare characteristics and features of processors used for personal computers. LO6: Select, install, and upgrade a processor. LO7: Compare the different kinds of physical memory and how they work. LO8: Understand how to upgrade memory.	
	Theme 3: Power supplies and troubleshooting computer problems	PM: Chapter 4
	LO9: Describe the methods and devices on how to keep a system cool. L10: Select a power supply to meet the power needs of a system. L11: Demonstrate an organised approach to solving any computer problem, especially hardware problems occurring during the boot. L12: Troubleshoot problems with the electrical system. L13: Troubleshoot problems with the motherboard, processor, and RAM.	

Learning Unit 3	Computing Devices
Overview: In this learning unit, we will examine aspects of input and output devices focussing on technical knowledge of the function, components, maintenance, and repair of different types of input and out devices. We will also explore monitors (video displays) and video cards (display adapters), and how these components interact. We will also discuss printer types, how to install, and troubleshoot printer problems.	

Learning Unit 3: Computing Devices		Prescribed Material (PM)
COAR5111 Sessions: 22–26 COAR5111d Sessions: 16-20 COAR5111p Sessions: 16-20 Academic Week: 6-7	**Theme 1: Supporting I/O Devices**	
	LO1: Describe the general approach technicians use to install and support I/O devices. LO2: Install and configure several I/O devices, such as mice, keyboards, webcams, microphones, touch screens, and display devices. LO3: Install and configure adapter cards. LO4: Support the video subsystem, including selecting a monitor and video card and supporting dual monitors. LO5: Understand how to troubleshoot common problems with I/O devices.	PM: Chapter 6
Related Outcomes: MO03	**Theme 2: Supporting Printers**	PM: Chapter 10
	LO1: Discuss printer types and features. LO2: Install and share printers. LO3: Manage printer features, add-on devices, and the printer queue. LO4: Perform routine maintenance tasks necessary to support printers. LO4: Understand how to troubleshoot printer problems.	

Learning Unit 4	Storage devices
Overview: In this learning unit, we focus on hard drive technologies and other storage devices. We will explore how different types of hard drives, optical drives, solid-state drives, and flash memory devices are supported, and how to select, install hard drives.	

Learning Unit 4	Storage devices

Learning Unit 4: Storage devices		Prescribed Material (PM)
COAR5111 Sessions: 27–37	Theme 1: Supporting hard drives and other storage devices.	
COAR5111d Sessions: 21-28	LO1: Describe technologies used inside a hard drive and how a computer communicates with a hard drive. LO2: Select and install a hard drive. LO3: Troubleshoot hard drives. LO4: Support optical drives, solid-state storage, and flash memory devices.	PM: Chapter 5
COAR5111p Sessions: 21-28		
Academic Week: 8-9		
Related Outcomes: MO01 MO02		

Learning Unit 5	Mobiles devices
Overview: In this learning unit, we will look at Mobile devices, mobile operating systems, wired and wireless connection. We will explore how to configure and troubleshoot mobile devices.	

Learning Unit 5   Mobiles devices

Learning Unit 5: Mobile Devices		Prescribed Material (PM)
COAR5111 Sessions: 38–48	Theme 1: Supporting Mobile Devices	
	LO1: Identify types of mobile devices, mobile operating systems, wireless and wired connections, and accessories.	PM: Chapter 9
COAR5111d Sessions: 29-36		
COAR5111p Sessions: 29-36	LO2: Configure email and synchronize content on mobile devices for business use.	
Academic Week: 9-12		
Related Outcomes: MO04	LO3: Troubleshoot common problems with mobile devices.	