MODULE HANDBOOK 2023 – 2024

Module Title: Introduction to Computer Architecture and Networking

Module Code: CT501-4-0-ICAN

Year /Level: Foundation

Credits: 3

Co – requisite or pre-requisite module(s): N/A

School: School of Foundation

Semester: 2

Contents

1.0 Introduction

Welcome to **Introduction to Computer Architecture and Networking**

Student are introduced to basic concepts of technology and its divisions. The module introduces students to the role of technology in modern life and its impact on the world and the environment. It gives students sufficient understanding of the fields of technology that will enable them to make informed choices about their future areas of study/specialization and career in technology.

People are relying on the computer and technology in their daily life to get their tasks done and at the same time also need to communicate and share resources between each other. It has almost become a necessity for every house to own computer devices and have connectivity to the Internet either using home network infrastructure or cellular network. In this module, students will be introduced to computer components and the architecture, together with fundamental concepts of networking. At the later part of this module, students will also explore various wired and wireless networking technologies and their examples of usage. Students will learn how to design and manage their own home networks, with some security measures and best practices within the implementation.

2.0 Module Team

Module Leader: Salmiah Binti Amin

Module Team – (If applicable, names and contact details)

(a) Noris Ismail

3.0 Module Learning Outcomes

Upon successful completion of this module, you will be able to:

CLO 1	Explain fundamental principles, structure, and organization of computer systems, including the role and operation of each of the component modules. (C2, PLO1)
CLO 2	Apply the knowledge of networking concepts such as topology, protocols and medium in designing a Local Area Network (C3, PLO2)
CLO 3	Propose a plan for a home network design based on the given scenario (A3, PLO8)

4.0 How will I learn on this module?

In this module you will attend a range of lecture classes as well tutorial classes. This also includes studying independently and preparing for assessments. The plan below describes the work you will need to do to be successful in this module.

Learning Topics and Activities					
Week #	**Weekly learning Outcomes**	**Topic Coverage**	**Hours**	**In class Learning Activities**	**Independent Learning Activities**
1	• Brief about the module, chapters, assessment and how to score the module.	Module Introduction and Ice-breaking session	30 minutes	Outline the nature of the module learning outcome and the number of assignments that students will be	Students need to fill in a form during ice breaking session. Getting to know between students and lecture.

				expected to complete.	
1	• Brief the History of Computer. • Explain the fundamentals of hardware architecture of the computer. • Explain the various elements and component that make computer system. • Describe the Types of Computers.	**Overview of Computer System**	2 hours	**Lecturer Presentation:** Online video teaching session on the overview of a computer systems **Lecturer Input:** Assist students in answering discussion and tutorial questions (online) **Activity:** Discuss about latest trend and technologies in computing – Cyber security and gaming PC or laptop. **Students Activity:** Online Tutorial 1: Overview on computer systems	Students reading on history of computers, computers components, system unit components and types of computer systems and their components.
2	• Understand how data is represented, stored, and manipulated inside a computer. • Understand the similarities and differences in the way computers represent numerical, character, and image data. • Represent numeric data in different numbering systems	**Data Representation**	2 hours	**Lecturer Presentation:** Online video teaching session on data representation (number bases and data format) **Lecturer Input:** Assist students in answering practices and tutorial questions (online) **Activity:** Practice during class on	Students reading and practice converting between different numbering systems. Students read and broaden their knowledge in data format type (text, images, audio and video)

				how to convert number bases – manually (pen and paper), using calculator and using online tools. **Students Activity:** Online Tutorial 2: Data Representation	
3	• Identify the components, criteria, and transmission modes of data communication. • Identify the components and criteria of a network. • Differentiate between internet, intranet and extranet. • Explain different types of network architecture. • List and explain different types of networks and network topologies.	**Networking Concepts and Technologies**	2 hours	**Lecturer Presentation:** Online video teaching session on network concepts and technologies (data communication and computer network) **Lecturer Input:** Assist students in answering discussion and tutorial questions (online) **Activity**: Discuss about how network was established and what devices required to setup a simple home network/SOHO (Small Office or Home Office) (Online) **Students Activity:** Online Tutorial 3: Networking Concepts and Technologies	Students practices on illustrating and explaining how data communication and network works. Students receives their assignment task and can start get the idea of what they need to do in their assignment

				Students practice drawing network setup using SmartDraw Tools.	
4	• Understand the definition of Transmission Medium. • Explain the characteristic of Wired and Wireless Network. • Describe different between Wired and Wireless. • Recognize different wireless WLAN design.	**Transmission Medium**	2 hours	**Lecturer Presentation:** Online video teaching session on transmission medium, wired and wireless network. **Lecturer Input:** Assist students in discussion home network connection and answering tutorial questions (online) **Activity:** Discuss type of transmission medium in home network (Online) **Students Activity:** Online Tutorial 4: Transmission Medium	Students reading on wired and wireless network technologies.
5	• Understand how internetworking devices relate to each other. • List types of internetworking devices and describe their function.	**Internetworking Devices**	2 hours	**Lecturer Presentation:** Online video teaching session on internetworking devices. **Lecturer Input:** Assist students in discussion usage of internetworking devices at home and answering	Students reading more about functionality of each networking devices.

				tutorial questions (online). **Activity:** Discuss type of internetworking devices in home network (Online) **Students Activity:** Online Tutorial 5: Internetworking devices	
6	• Describe OSI Model in brief • Explain the functions of each layer in the OSI model	**Network Standard and Protocol (Part 1)– Introduction to OSI Model**	2 hours	**Lecturer Presentation:** Online video teaching session on open system interconnection (OSI) model. **Lecturer Input:** Assist students in memorizing technique and answering tutorial questions (Online) **Activity**: Practices memorization technique for 7 layers of OSI model (Online) **Students Activity:** Online Tutorial 6: Introduction to Open System Interconnection (OSI) model.	Students reading on details of OSI Model
7	• Define network protocols • List standards organizations	**Network Standard and Protocol (Part 2)– Ethernet and TCP/IP**	2 hours	**Lecturer Presentation:** Online video teaching session on network protocols,	Students reading on standard organizations functions and find example use of

	• Differentiate between OSI and TCP/IP Model Describe network protocols in OSI and TCP/IP Model, ethernet and wireless standards			standard organizations, ethernet and TCP/IP protocol. **Lecturer Input:** Assist students in memorizing technique and answering tutorial questions (online) **Activity:** Practice memorizing TCP/IP protocol and find differences with OSI model (online). **Students Activity:** Online Tutorial 7: Ethernet and TCP/IP	ethernet and TCP/IP protocol.
8	• Explain the basic concepts of network security. List and discuss several WLAN Security and identify their potential prevention techniques.	**Network Standard and Protocol (Part 3)– WLAN Security**	2 hours	**Lecturer Presentation:** Online video teaching session on WLAN security and its protocol. **Lecturer Input:** Assist students in answering tutorial questions (online). **Activity:** Discuss the latest network security protocol (online) **Students Activity:** Online Tutorial 8: WLAN Security	Students reading and understand of WLAN security element and its protocol.
9	• Define the basic components of a CPU, including the	**CPU and Registers**	2 hours	**Lecturer Presentation:** Online video	Students reading on CPU and register

	ALU, CU, and registers, and explain their role in executing instructions and performing calculations. • Differentiate between the ALU and CU, and understand their respective functions in performing arithmetic and logical operations in a CPU. • Define what a register is and how it is used in a CPU to store and manipulate data during processing.			teaching session on CPU and Registers. **Lecturer Input:** Assist students in answering tutorial questions (online) **Activity**: Visualize and watch video how the CPU and registers work (online). **Students Activity:** Online Tutorial 9: CPU and Registers	
10	• Identify the different types of computer memory, including primary and secondary memory, and explain their roles in storing and accessing data and instructions within a computer system. • Understand the concept of the instruction cycle and its stages (fetch, decode, execute, store), and explain how instructions are processed and executed by the CPU.	**Memory and Instructions**	2 hours	**Lecturer Presentation:** Online video teaching session on memory and instruction cycle within CPU **Lecturer Input:** Assist students in answering tutorial questions (online) **Activity**: Discuss the difference between each stage of instructions (online). **Students Activity:** Online Tutorial 10: Memory and Instructions	Students reading on type of memory and its function.

	• Describe the function and importance of cache memory in improving system performance and explain the different levels of cache and their impact on data access speed.				
11	• Understand the concept of buses in computer architecture and their role in facilitating communication and data transfer between components. • Differentiate between the types of buses, including system bus, expansion bus, and I/O bus, and comprehend their functions and characteristics. • Gain knowledge of interfaces and their significance in connecting devices to the bus, including memory interfaces, display interfaces, and storage interfaces, and comprehend their specific functions and standards.	**Bus and I/O interfaces**	2 hours	**Lecturer Presentation:** Online video teaching session on bus and I/O interfaces **Lecturer Input:** Assist students in answering tutorial questions (online) **Activity**: List and discuss about I/O interfaces (ports) in a computer system unit (online). **Students Activity:** Online Tutorial 11: Bus and I/O interfaces	Students reading on type of bus and I/O interfaces including ports (jack).

12		**Presentation and Module Summary**	2 hours	Module summary by students and lecturers. Recorded Presentation by students for their individual assignment – home network design.	Students practices their presentation for their assessment.

5.0 Attendance and Absence

Attendance for all formal teaching is compulsory (online availability once a week). On some occasions, for instance illness, your absence may be unavoidable. All absences must be notified to the relevant lecturer or Office immediately. Please refer to your Programme Handbook for contact details. The University needs to satisfy itself that you are engaged in your studies and will monitor your attendance at regular intervals. This is a particular requirement for international students but applies equally to all students. Details of when and how this will be undertaken will be given to you at orientation briefing.

6.0 Learning Resources

Provide a list of resources used by the module; book lists; key journals; software to be used.

Essential Readings:

1. Irv Englander, Wilson Wong (2021) The Architecture of Computer Hardware, Systems Software, and Networking: An Information Technology Approach 6th Edition. ISBN : 978-1119495208
2. Everett, T., Hutz, A., and Meyers, M. (2022), CompTIA A+ Certification All-in-One Exam Guide (Exams 220-901 & 220-902). 11th Ed. USA: McGraw-Hill Education. (ISBN-13: 978-1264609901)
3. Buchanan, M. (2022). The Home Network Manual: The Complete Guide to Setting Up, Upgrading, and Securing Your Home Network. Buchanan Holdings, LLC. USA. ISBN-13: 978-1735543062

Further Readings:

Papercut Limited. (2022). The Complete Manual Series: Home Networking & Security. Magazine.

Special Requirement (e.g: software, nursery, computer lab, simulation room, etc):

7.0 Assessments

This module is assessed by:

Assessment Summary						
Form of Assessment	**Description**	**Duration (hour(s)**	**Hand out Date**	**Hand in Date**	**Marks Allocation**	**CLOs Assessed**
Final Assessment	Final Examination	2 hrs			50%	1 and 2
Continuous Assessment	Individual Assignment		Week 3	Week 11	50%	3

To pass a module, you must attempt every element of assessment and achieve at least 50% in the module overall. (adjust if necessary to reflect module specific regulations)

If you fail to pass the module, you will be required to re-sit any assessment components for which you did not pass. *Details on Regulation and Policies are available at* https://lms2.apiit.edu.my/course/view.php?id=750

8.0 Submission and Feedback

How do I submit my assessments?

Each module will have a different set of assessments and submission dates/times as stated in Section 7 above. It is your responsibility to be aware of the deadlines and to meet them.

You must submit all pieces of assessment required for each module to Admin Services, or online through APU's official submission portal for electronic submissions, on or before the submission date for each piece of assessment. Failure to do so may result in failure of the module overall.

Failure to meet a deadline will be treated as a non-submission and a Grade Point 0 will be awarded for that component. The only exceptions to these rules apply where a valid claim for extenuating circumstances can be made and is approved.

There may be occasions when you are unable to submit or undertake a piece of assessment due to circumstances beyond your control. APU has put in place a procedure for dealing with such extenuating circumstances. You can find more information in the Student Guide to Extenuating Circumstances which is available in the Regulations & Policies section on Moodle.

How do I get feedback on my work?

You will normally receive feedback on all assessments, other than examinations, within 20 working days following the date of submission.

APU aims to release feedback within set weeks so that you can have as much of your feedback at once making the process less stressful.

Feedback will vary between modules; however, you will receive feedback via the Coursework Submission and Feedback Form (CSFF) as a minimum. Feedback may also be received by forums, interviews, and individual feedback sessions.

You will also be able to access your results via Moodle.

How can I give feedback on the module?

You are welcome to discuss your views with your lecturer on the module at any time. Views may also be expressed through your Programme Leader or via Programme Committee Meetings (PCM). During the course of the module, you will be encouraged to fill in the anonymous evaluation questionnaires to assist the University in its monitoring and planning. Such questionnaires are important for the benefit of your fellow and future students. We would be grateful for your full and prompt co-operation in completing them in a constructive and objective way. You will be able to access the Online Course Appraisal System at: http://webapps.apiit.edu.my/appraisal/

Students who do not complete their course appraisal by the stipulated date indicated on their examination schedule (posted on the webspace) could find their results withheld until they complete their course appraisal.

9.0 Academic Integrity

This module requires that you demonstrate what you have learnt and that you have achieved the learning outcomes of the module. The University requires you to comply with the regulations on academic conduct. Academic misconduct includes but is not restricted to cheating in examinations, making - up data and plagiarism.

Plagiarism is the use of someone else's work (words, images, tables or ideas etc) without acknowledging the source. This includes materials from the internet as well as library books and the work of another person. Plagiarism is an assessment offence and any individual (who is suspected of plagiarism) will be referred to the University Academic Dishonesty Board. Please refer to https://lms2.apiit.edu.my/course/view.php?id=750 for further information.

10.0 Module Descriptor

The module descriptor for this module is available on Moodle