# **Tutorial Letter 101/0/2023**

**Networks IV** 

**IRM4721** 

**Year Module** 

# **School of Computing**

**Department of Information Systems** 

#### IMPORTANT INFORMATION

Please register on myUnisa, activate your myLife e-mail account and make sure that you have regular access to the myUnisa module website, IRM4721-23-Y

Note: This is a fully online module. It is, therefore, only available on myUnisa.

BARCODE



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#### 1 INTRODUCTION

#### Dear Student

It is a pleasure to welcome you as a student. We hope that you find your studies stimulating, meaningful and enriching. You will be well on your way to success if you start studying early in the year so that you have enough time to submit your assignments, complete the online activities and prepare for the examination.

Unisa is a comprehensive open distance e-learning (CODeL) higher education institution. The comprehensiveness of our curricula encapsulates a range of offerings, from strictly vocational to strictly academic certificates, diplomas, and degrees. Unisa's "openness" and its distance eLearning character result in many students registering at Unisa who may not have had an opportunity to enrol in higher education. Our CODeL character implies that our programmes are carefully planned and structured to ensure success for students ranging from the under-prepared but with potential to the sufficiently prepared.

Teaching and learning in a CODeL context involve multiple modes of delivery ranging from blended learning to fully online. As a default position, all post graduate programmes are offered fully online with no printed study materials, while undergraduate programmes are offered in a blended mode of delivery where printed study materials are augmented with online teaching and learning via the learner management system – myUnisa. In some instances, undergraduate programmes are offered fully online as well.

Furthermore, our programmes are aligned with the vision, mission, and values of the University. Unisa's commitment to serve humanity and shape futures combined with a clear appreciation of our location on the African continent, Unisa's graduates have distinctive graduate qualities which include

- independent, resilient, responsible, and caring citizens who can fulfil and serve in multiple roles in their immediate and future local, national, and global communities
- having a critical understanding of their location on the African continent with its histories, challenges, and potential in relation to globally diverse contexts
- the ability to critically analyse and evaluate the credibility and usefulness of information and data from multiple sources in a globalised world with its ever-increasing information and data flows and competing worldviews
- how to apply their discipline-specific knowledges competently, ethically, and creatively to solve real-life problems
- an awareness of their own learning and developmental needs and future potential

#### IRM4721 is an online module

Whether a module is offered either as blended (meaning that we use a combination of printed and online material to engage with you) or online (all information is available via the internet), we use myUnisa as our virtual campus. This is an online system that is used to administer, document, and deliver educational material to you and support engagement with you. Look out for information from your lecturer as well as other Unisa platforms to determine how to access the virtual myUnisa module site. Information on the tools that will be available to

engage with the lecturer and fellow students to support your learning will also be communicated via various platforms.

## 1.1 Getting started

Since IRM4721 is an online module, you need to use myUnisa <a href="https://my.unisa.ac.za">https://my.unisa.ac.za</a> to study and complete the assignments for this module. Go to the website and login using your student number and password. Click on "myModules" at the top of the web page and select IRM4721-23-Y from the dropdown arow.

We wish you every success with your studies!

## 2 MODULE OVERVIEW

# 2.1 Purpose

This module introduces the fundamental building blocks that form a modern network, such as protocols, media, topologies, and hardware. It then provides in depth coverage of the most important concepts in contemporary networking, such as TCP/IP, Ethernet, wireless transmission, virtual networks, security, and troubleshooting. After completing this course and completing the exercises, students will be equipped to select the best network design, hardware and software. Students will also acquire the skills to build a network from scratch and maintain, upgrade, troubleshoot, and manage an existing network.

#### 2.2 Outcomes

For this module, you will have to master several outcomes:

#### **Specific Outcome 1:**

Understand the fundamentals of networking, network infrastructure and documentation

#### **Assessment Criteria**:

- 1. Distinguish between peer-to-peer and client-server networks and identify applications and protocols used on a network
- 2. Describe various networking hardware devices and the most common physical topologies
- 3. Describe the seven layers of the OSI model
- 4. Explain best practices for safety when working with networks and computers and describe the steps for troubleshooting network problems
- 5. Describe the roles of various network and cabling equipment in commercial buildings and work areas
- 6. Maintain network documentation and manage changes made to a network

# **Specific Outcome 2:**

Understand network addressing and network protocols

#### **Assessment Criteria**:

- 1. Work with MAC addresses and configure TCP/IP settings
- 2. Identify the ports of several common network protocols
- 3. Describe domain names and the name resolution process
- 4. Use command-line tools to troubleshoot common network problems
- 5. Describe the functions of core TCP/IP protocols
- 6. Secure network connections using encryption protocols and configure remote access connections between devices
- 7. Employ various TCP/IP utilities for network discovery and troubleshooting

#### **Specific Outcome 3:**

Understand network cabling and wireless transmissions

## **Assessment Criteria:**

- 1. Explain basic data transmission concepts and compare the benefits and limitations of various networking media
- 2. Describe the physical characteristics of and official standards for different types of cables and their related connectors
- 3. Select the appropriate tool to troubleshoot common cable problems
- 4. Describe the characteristics of wireless transmissions
- 5. Explain 802.11 standards and innovations
- 6. Plan, secure and troubleshoot a Wi-Fi network

#### **Specific Outcome 4:**

Explain network architecture

#### **Assessment Criteria:**

- 1. Explain types of abstraction in the design of physical network architecture
- 2. Describe and explain virtualization technologies on a network
- 3. Summarize cloud characteristics, models, and connectivity options
- 4. Identify methods to increase network availability

## **Specific Outcome 5:**

Understand network segmentation

# **Assessment Criteria:**

- 1. Explain the purposes of network segmentation
- 2. Describe how subnetting works and calculate subnets
- 3. Configure VLANs

# **Specific Outcome 6:**

**Understand Wide Area Networking** 

## **Assessment Criteria:**

- 1. Identify the fundamental elements of WAN service options and explain how routers manage internetwork communications
- 2. Compare and contrast WAN connectivity technologies
- 3. Explain the most common wireless WAN technologies
- 4. Troubleshoot common connection problems

# **Specific Outcome 7:**

Understand network risk management, security in network design and performance and recovery

#### **Assessment Criteria**:

- 1. Identify people, technology, and malware security risks to a network
- 2. Increase network security through risk assessment and management
- 3. Use physical security to prevent and detect intrusions and implement device hardening techniques
- 4. Incorporate security into the design of a network and describe the functions and features of various network security devices
- 5. Explain how authentication, authorization, and accounting work together to help secure a network and compare authentication technologies
- 6. Use appropriate tools to collect data about the network
- 7. Identify methods to optimize network performance
- 8. Identify best practices for incident response and disaster recovery

#### 3 CURRICULUM TRANSFORMATION

Unisa has implemented a transformation charter, in terms of which the university has placed curriculum transformation high on the teaching and learning agenda. Curriculum transformation includes student-centred scholarship, the pedagogical renewal of teaching and assessment practices, the scholarship of teaching and learning, and the infusion of African epistemologies and philosophies. All of these will be phased in at both programme and module levels, and because of this you will notice a marked change in the teaching and learning strategy implemented by Unisa, together with the way in which the content is conceptualised in your modules. We encourage you to embrace these changes during your studies at Unisa in a responsive way within the framework of transformation.

# 4 LECTURER(S) AND CONTACT DETAILS

If you experience problems with your studies during the year, please feel free to e-mail (most preferable) or phone, your lecturer. Always include your full name, student number and course code in all correspondence.

#### 4.1 Lecturer

The primary lecturer for this module is: **Dr H. Abdullah** 

**Department:** Department of Information Systems, School of Computing

**Telephone:** (011) 670 9100

E-mail: abdulh@unisa.ac.za

Lecturers may be subject to change from year to year. The name(s) and contact details of the lecturer(s) responsible for this module can be found in the Tutorial Letter entitled **COSALL/301/0/2023**, which is compiled by the School of Computing. The details of the lecturer responsible will also be supplied in the welcome message on myUnisa.

## 4.2 Department

The Computer Science Department within the School of Computing is situated on the Science Campus in Florida. The department can be contacted at 011 670 9200 or via e-mail to <a href="mailto:computing@unisa.ac.za">computing@unisa.ac.za</a>. Should you be unable to reach any of the lecturers for IRM4721, leave a message and your contact details with one of the secretaries, who can be contacted via the number given above.

# 4.3 University

To contact the University, follow the instructions on the Contact us page on the Unisa website. Contact addresses of the various administrative departments appear on the Unisa website: <a href="http://www.unisa.ac.za/sites/corporate/default/Contact-us/Student-enquiries">http://www.unisa.ac.za/sites/corporate/default/Contact-us/Student-enquiries</a>.

Please include the student number in all correspondence.

#### 5 RESOURCES

## 5.1 Joining myUnisa

The myUnisa learning management system is the University's online campus which will help you communicate with your lecturers, other students, and the administrative departments within Unisa. To claim your myUnisa account, please follow the steps below:

- 1. Visit the myUnisa website at https://my.unisa.ac.za/portal
- 2. Click on the **"Claim Unisa login"** link on the top of the screen under the orange user ID box.
- 3. A new screen will load, prompting you to **enter your student number**. Please enter your student number and click **"continue"**.
- 4. Enter your surname, your full name, your date of birth and, finally, your South African ID number (for South African citizens) OR your passport number (for foreign students). Then

- click "continue". Remember to enter either an ID number or a passport number, NOT both.
- 5. Please read through the guidelines and **click all the check boxes** to acknowledge that you have read all the information provided. Once you are done, click the **"Acknowledge"** button to redirect you to the final page in the process.
- 6. The final page will display your myLife e-mail address, and your myLife AND myUnisa password. This password will also be sent to the cellphone number displayed on the page for safekeeping.
- 7. Please note that it can take up to 24 hours for your myLife e-mail account to be created.

Remember, the password provided is your myUnisa AND myLife password.

#### 5.2 Prescribed book

Title:	CompTIA Network+ Guide to Networks
Author:	Jill West
Publisher:	Cengage
Edition	9 <sup>th</sup>
Date of Publication:	2022
ISBN-13	9780357508138
ISBN-10	0357508130

STUDENTS WILL NOT BE SUPPORTED ON ANY OTHER BOOKS BESIDES THE PRESCRIBED BOOK. STUDENTS WILL ALSO NOT BE SUPPORTED ON PREVIOUS EDITIONS OF THE PRESCRIBED BOOK.

## In this module we cover the following modules of the prescribed book:

Module 1	Introduction to Networking
Module 2	Infrastructure and Documentation
Module 3	Addressing
Module 4	Protocols
Module 5	Cabling
Module 6	Wireless Networking
Module 7	Network Architecture
Module 8	Segmentation
Module 9	Wide Area Networking
Module 10	Risk Management
Module 11	Security in Network Design
Module 12	Performance and Recovery

## 5.3 Recommended book(s)

We use only the prescribed textbook and the tutorial matter when we set the examination paper. That means that you do not need any additional material for this module. However, each semester we find students who contact us for additional reading material. Many books have been written on the subject Computer Networks and the UNISA library has several of them. If you have time for some extra reading, visit our library. Alternatively, use your Internet connection to visit the on-line library catalogue. You may also find relevant sources of information on the Internet.

## 5.4 Electronic reserves (e-reserves)

E-reserves can be downloaded from the Library catalogue. More information is available at: <a href="https://libguides.unisa.ac.za/request/request/">https://libguides.unisa.ac.za/request/request/</a>

## 5.5 Library services and resources

The Unisa library offers a range of information services and resources:

- For brief information, go to <a href="https://www.unisa.ac.za/library/libatglance">https://www.unisa.ac.za/library/libatglance</a>
- For more detailed library information, go to <a href="http://www.unisa.ac.za/sites/corporate/default/Library">http://www.unisa.ac.za/sites/corporate/default/Library</a>
- For research support and services (e.g. the services offered by personal librarians and the request a literature search service offered by the information search librarians), go to <a href="http://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Research-support">http://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Research-support</a>
- For library training for undergraduate students, go to https://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Training

The library has created numerous library guides, available at <a href="http://libguides.unisa.ac.za">http://libguides.unisa.ac.za</a>

#### Recommended guides:

- Request and find library material/download recommended material: http://libguides.unisa.ac.za/request/request
- Postgraduate information services: <a href="http://libguides.unisa.ac.za/request/postgrad">http://libguides.unisa.ac.za/request/postgrad</a>
- Finding and using library resources and tools: http://libguides.unisa.ac.za/Research\_skills
- Frequently asked questions about the library: http://libguides.unisa.ac.za/ask
- Services to students living with disabilities: http://libguides.unisa.ac.za/disability
- A–Z of library databases: https://libguides.unisa.ac.za/az.php

Important contact information:

- Ask a librarian: <a href="https://libguides.unisa.ac.za/ask">https://libguides.unisa.ac.za/ask</a>
- Technical problems encountered in accessing library online services: <u>Lib-help@unisa.ac.za</u>
- General library-related queries: Library-enquiries@unisa.ac.za
- Queries related to library fines and payments: Library-fines@unisa.ac.za
- Social media channels: Facebook: UnisaLibrary and Twitter: @UnisaLibrary

#### **6 STUDENT SUPPORT SERVICES**

The Study @ Unisa brochure is available on myUnisa: www.unisa.ac.za/brochures/studies

This brochure contains important information and guidelines for successful studies through Unisa.

If you need assistance about the myModules system, you are welcome to use the following contact details:

- Toll-free landline: 0800 00 1870 (Select option 07 for myModules)
- E-mail: mymodules23@unisa.ac.za or myUnisaHelp@unisa.ac.za

You can access and view short videos on topics such as how to view your calendar, how to access module content, how to view announcements for modules, how to submit assessment and how to participate in forum activities via the following link:

https://dtls-ga.unisa.ac.za/course/view.php?id=32130

Registered Unisa students get a free myLife e-mail account. Important information, notices and updates are sent exclusively to this account. Please note that it can take up to 24 hours for your account to be activated after you have claimed it. Please do this immediately after registering at Unisa, by following this link: myLifeHelp@unisa.ac.za

Your myLife account is the **only** e-mail account recognised by Unisa for official correspondence with the university and will remain the official primary e-mail address on record at Unisa. You remain responsible for the management of this e-mail account.

## 6.1 First-Year Experience Programme

Many students find the transition from school education to tertiary education stressful. This is also true in the case of students enrolling at Unisa for the first time. Unisa is a dedicated open distance and e-learning institution, and it is very different from face-to-face/contact institutions. It is a mega university, and all our programmes are offered through either blended learning or fully online learning. It is for this reason that we thought it necessary to offer first-time students additional/extended support to help them seamlessly navigate the Unisa teaching and learning journey with little difficulty and few barriers. We therefore offer a specialised student support programme to students enrolling at Unisa for the first time — this is Unisa's First-Year

Experience (FYE) Programme, designed to provide you with prompt and helpful information about services that the institution offers and how you can access information. The following FYE services are currently offered:

- FYE website: All the guides and resources you need to navigate through your first year at Unisa can be accessed using the following link: www.unisa.ac.za/FYE
- FYE e-mails: You will receive regular e-mails to help you stay focused and motivated.
- FYE broadcasts: You will receive e-mails with links to broadcasts on various topics related to your first-year studies (e.g., videos on how to submit assessments online).
- FYE mailbox: For assistance with queries related to your first year of study, send an e-mail to <a href="mailto:fye@unisa.ac.za">fye@unisa.ac.za</a>.

#### 7. STUDY PLAN

The study plan in terms of the due dates of the assessments, the prescribed material, and the actual assessments to complete is available on myUNISA.

#### 8 HOW TO STUDY ONLINE

#### 8.1 What does it mean to study fully online?

Studying fully online modules differs completely from studying some of your other modules at Unisa.

- All your study material and learning activities for online modules are designed to be delivered online on myUnisa.
- All your assignments must be submitted online. This means that you will do all your
  activities and submit all your assignments on myUnisa. In other words, you may NOT
  post your assignments to Unisa using the South African Post Office.
- All communication between you and the University happens online. Lecturers will
  communicate with you via e-mail and SMS, and use the Announcements, the
  Discussion Forums and the Questions and Answers tools. You can also use all these
  platforms to ask questions and contact your lecturers.

#### 9. ASSESSMENT

#### 9.1 Assessment criteria

Assignments will be compiled according to the following criteria:

- To test your knowledge of the comprehension of networking concepts.
- To test your ability to answer case-study and theoretical application type of questions.

## 9.2 Assessment plan

- To complete this module, you will be required to submit **4 (four) assessments**.
- All information about when and where to submit your assessments will be made available to you via the myModules site for your module.
- Due dates for assessments, as well as the actual assessments are available on the myModules site for this module.

- To gain admission to the examination, you will be required to submit 1 (one) assignment.
- The assignment weighting for the module is **20%**.
- You will receive examination information via the myModules sites. Please watch out for announcements on how examinations for the modules for which you are registered will be conducted.
- The examination will count **80%** towards the final module mark.

#### 9.3 Assessment due dates

- There are no assignment **due dates** included in this tutorial letter.
- Assignment due dates will be made available to you on the myUnisa landing page for this module. We envisage that the due dates will be available to you upon registration.
- Please start working on your assessments as soon as you register for the module.
- Log on to the myUnisa site for this module to obtain more information on the due dates for the submission of the assessments.

#### 9.4 Submission of assessments

- Unisa, as a comprehensive open distance e-learning institution (CODeL), is moving towards becoming an online institution. You will therefore see that all your study material, assessments and engagements with your lecturer and fellow students will take place online. We use myUnisa as our virtual campus.
- The myUnisa virtual campus will offer students access to the myModules site, where learning material will be available online and where assessments should be completed. This is an online system that is used to administer, document, and deliver educational material to students and support engagement between academics and students.
- The myUnisa platform can be accessed via <a href="https://my.unisa.ac.za">https://my.unisa.ac.za</a>. Click on the myModules 2023 button to access the online sites for the modules that you are registered for.
- The university undertakes to communicate clearly and as frequently as is necessary to
  ensure that you obtain the greatest benefit from the use of the myModules learning
  management system. Please access the announcements on your myModules site
  regularly, as this is where your lecturer will post important information to be shared with
  you.
- When you access your myModules site for the module/s you are registered for, you will see a welcome message posted by your lecturer. Below the welcome message you will see the assessment shells for the assessments that you need to complete. Some assessments may be multiple choice, some tests, others written assessments, some forum discussions, and so on. All assessments must be completed on the assessment shells available on the respective module platforms.
- To complete quiz assessments, please log on to the module site where you need to complete the assessment. Click on the relevant assessment shell (Assessment 1, Assessment 2, etc.). There will be a date on which the assessment will open for you. When the assessment is open, access the quiz online and complete it within the time available to you. Quiz assessment questions are not included in this tutorial letter

(Tutorial Letter 101) and are only made available online. You must therefore access the quiz online and complete it online where the quiz has been created.

- It is not advisable to use a cell phone to complete the quiz. Please use a desktop computer, tablet or laptop when completing the quiz. Students who use a cell phone find it difficult to navigate the **Online Assessment** tool on the small screen and often struggle to navigate between questions and successfully complete the quizzes. In addition, cell phones are more vulnerable to dropped internet connections than other devices. If possible, please do not use a cell phone for this assessment type.
- For written assessments, please note the due date by which the assessment must be submitted. Ensure that you follow the guidelines given by your lecturer to complete the assessment. Click on the submission button on the relevant assessment shell on myModules. You will then be able to upload your written assessment on the myModules site of the modules that you are registered for. Before you finalise the upload, double check that you have selected the correct file for upload. Remember, no marks can be allocated for incorrectly submitted assessments.

#### 9.5 The assessments

As indicated in section 9.2, you need to complete **4 (four)** assessments for this module. **There are no assignments included in this tutorial letter.** Assignments and due dates will be made available to you on myModules for this module. We envisage that the due dates will be available to you upon registration.]

#### 9.6 The examination

Examination information and details on the format of the examination will be made available to you online via the myUnisa site. Look out for information that will be shared with you by your lecturer and e-tutors (where relevant) and for communication from the university.

## 9.6.1 Invigilation/proctoring

Since 2020 Unisa conducts all its assessments online. Given stringent requirements from professional bodies and increased solicitations of Unisa's students by third parties to unlawfully assist them with the completion of assignments and examinations, the University is obliged to assure its assessment integrity through the utilisation of various proctoring tools: Turnitin, Moodle Proctoring, the Invigilator App and IRIS. These tools will authenticate the student's identity and flag suspicious behaviour to assure credibility of students' responses during assessments. The description below is for your benefit as you may encounter any or all of these in your registered modules:

**Turnitin** is a plagiarism software that facilitates checks for originality in students' submissions against internal and external sources. Turnitin assists in identifying academic fraud and ghost writing. Students are expected to submit **typed** responses for utilisation of the Turnitin software.

The **Moodle Proctoring tool** is a facial recognition software that authenticates students' identity during their Quiz assessments. This tool requires access to a student's **mobile or laptop camera**. Students must ensure their camera is activated in their browser settings prior to their assessments.

The Invigilator "mobile application-based service does verification" of the identity of an assessment participant. The Invigilator Mobile Application detects student dishonesty-by-proxy and ensures that the assessment participant is the registered student. This invigilation tool requires students to download the app from their Play Store (Google, Huawei and Apple) on their **mobile devices** (camera enabled) prior to their assessment.

**IRIS Invigilation** software verifies the identity of a student during assessment and provides for both manual and automated facial verification. It can record and review a student's assessment session. It flags suspicious behaviour by the students for review by an academic administrator. IRIS software requires installation on students' **laptop devices** that are enabled with a webcam.

Students who are identified and flagged for suspicious dishonest behaviour arising from the invigilation and proctoring reports are referred to the disciplinary office for formal proceeding.

Students must refer to their module assessment information on their myModule sites to determine which proctoring or invigilation tool will be utilised for their formative and summative assessments.

#### 9.7 Supplementary

If you obtain between 45% and 49% as a **final** mark, you will be allowed to write a supplementary examination. To pass this supplementary examination, you must obtain at least 50% in the examination itself. If you qualify for a supplementary examination, no further study material will be supplied to you.

#### 10. ACADEMIC DISHONESTY

#### 10.1 Plagiarism

Plagiarism is the act of taking the words, ideas and thoughts of others and presenting them as your own. It is a form of theft. Plagiarism includes the following forms of academic dishonesty:

- Copying and pasting from any source without acknowledging the source.
- Not including references or deliberately inserting incorrect bibliographic information.
- Paraphrasing without acknowledging the original source of the information.

#### 10.2 Cheating

Cheating includes, but is not limited to, the following:

- Completing assessments on behalf of another student, copying the work of another student during an assessment, or allowing another student to copy your work.
- Using social media (e.g., WhatsApp, Telegram) or other platforms to disseminate assessment information.
- Submitting corrupt or irrelevant files, this forms part of examination guidelines
- Buying completed answers from so-called "tutors" or internet sites (contract cheating).

## **10.3** For more information about plagiarism, follow the link below:

https://www.unisa.ac.za/sites/myunisa/default/Study-@-Unisa/Student-values-and-rules

#### 11. STUDENTS LIVING WITH DISABILITIES

The Advocacy and Resource Centre for Students with Disabilities (ARCSWiD) provides an opportunity for staff to interact with first-time and returning students with disabilities.

If you are a student with a disability and would like additional support or need additional time for assessments, you are invited to contact (name and e-mail address of the lecturer must be inserted) to discuss the assistance that you need.

## 12. IN CLOSING

Do not hesitate to contact us by e-mail if you are experiencing problems with the content of this tutorial letter or with any academic aspect of the module. We wish you a fascinating and satisfying journey through the learning material, and trust that you will complete the module successfully.

Enjoy the journey!!!!

DR H. ABDULLAH - IRM4721

**DEPARTMENT OF INFORMATION SYSTEMS** 

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