Tutorial letter 101/0/2024

APM2613

Year module

Department of Mathematical Sciences

IMPORTANT INFORMATION:

Please activate your *my*Unisa and myLife e-mail account and make sure that you have regular access to the *my*Unisa module website APM2613-24-Y, as well as your group website.

Note: This is a fully online module. It is therefore, only available on *my*Unisa.

Define tomorrow.

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1   INTRODUCTION

Welcome to the Numerical Methods module, APM2613 offered by the Department of Mathematical Sciences at Unisa. We trust that you will find this module both interesting and rewarding as you equip yourself with numerical skills for your career.

This tutorial letter contains important information about the scheme of work, resources and assignments for this module as well as exam admission. We urge you to read it carefully before working through the study material, preparing the assignment(s), preparing for the examination and addressing questions to your lecturers.

Right from the start we would like to point out that **you must read all the tutorial letters** you access from the module site **immediately and carefully**, as they always contain important and, sometimes urgent information.

Because this is a fully online module, you will need to use *my*Unisa to study and complete the learning activities for this course. Please visit the website for MAT1503 on *my*Unisa frequently for announcements, new material and resources. The website for your module is APM2613-23-Y.

1.1   Getting started

Owing to the nature of this module, you can read about the module and find your study material online. Go to the website at https://my.unisa.ac.za and log in using your student number and password. Click on "myModules" at the top of the web page and then on "Sites" in the top right corner. In the new window, click on the grey Star icon next to the modules you want displayed on your navigation bar. Close the window in the top right corner. Then select the option "Reload to see your updated favorite sites". Now go to your navigation bar and click on the module you want to open.

We wish you every success with your studies!

1.2   *my*Unisa

Unisa follows an Open Distance eLearning (ODeL) model of Teaching and Learning. The platform for teaching and learning at Unisa is *my*Unisa. You must be registered on *my*Unisa (http://my.unisa.ac.za) to be able to submit assignments online, gain access to the library functions, services and various learning resources, download study material, "chat" to your lecturers and fellow students about your studies and the challenges you encounter, and participate in online discussion forums. *my*Unisa provides additional opportunities to take part in activities and discussions of relevance to your module, assignments, marks and examinations.

1.3   What does it mean to study online?

At Unisa, studying fully online entails the following:

- **All your study material and learning activities for online modules are designed to be delivered online on myUnisa.**

- **All your assignments (assessments) must be submitted online**. This means that you will do all your activities and submit all your assignments on myUnisa. In other words, you do **NOT** post your assignments to Unisa using the South African Post Office. You do **NOT** send assignments by email as such will not be considered for marking or a zero mark will be awarded.

- **All communication between you and the University happens online.** Lecturers will communicate with you via e-mail and **Chats**, **Discussions**, **Blogs**, and use the **Announcements**, the **FAQs**, the **Discussion Forums** and the **Questions and Answers** tools. You can also use all of these platforms to ask questions and contact your lecturers.

2   CURRICULUM TRANSFORMATION

Unisa has implemented a transformation charter based on five pillars and eight dimensions. In response to this charter, we have placed curriculum transformation high on the teaching and learning agenda. Curriculum transformation includes the following pillars: 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. These pillars and their principles will be integrated at both programme and module levels as a phased-in approach. You will notice a marked change in the teaching and learning strategy implemented by Unisa, together with how 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.

3   OVERVIEW OF THE MODULE

3.1   Purpose

This module is available as part of a major in Applied Mathematics *and* Computer Science. The purpose of the module is to enable students to understand and use numerical methods in solving scientific and mathematical problems that are difficult to solve analytically. In a nut shell, it comprises of numerical solution of nonlinear equations and systems of equations, the construction and use of interpolating polynomials, least squares approximation, numerical differentiation and integration.

In this module you will learn how to develop and use numerical methods to solve mathematical problems by hand calculating devices with the help of a computer. While the emphasis is on the more practical aspects, a good mathematical background is essential. We therefore advise you to include second year mathematics, in particular MAT2611 and MAT2613, in your curriculum.

The module that follows Numerical Methods 1 is, of course, Numerical Methods 2 (APM3711) which is also available as a subject in Computer Science *and* Applied Mathematics. Although numerical methods are not dependent on any specific programming language, many software packages are available as an aid to the study of numerical methods. *You are therefore expected to learn one or two programming languages (like Matlab/Octave, Python, C++ or Maple) on your own and to be able to write relatively simple programs/code in the language*. Matlab/Octave is a preferred language for this module as it is able to handle numerical computations with less effort. Some of these software packages are open source or have open source versions that you can download. Octave is the free version of Matlab, so it is available for download.

3.2   Broad Outcomes

The broad outcomes for this module are as follows:

At the end of this module, you should be able to

1. Analyse and draw a rough graph of any given function.

2. Solve various types of nonlinear equations using various numerical methods and interpret the results.

3. Solve sets of linear equations using a variety of numerical methods.

4. Construct interpolating polynomials and fit curves to given data.

5. Perform numerical differentiation and integration.

4   ASSUMED BACKGROUND KNOWLEDGE

4.1   Pre-requisites

The compulsory pre-requisite for this module is **COS1511** (Introduction to Programming). The programming knowledge acquired in this module helps with handling the intensive computations

involved in APM2613. Other assumed background knowledge is general knowledge of functions and their calculus.

4.2 Co-requisites

In order to be able to understand the relevance of this module you should have done some Pre-calculus and Linear Algebra. Hence it is recommended that you take MAT1503 (Linear Algebra I) and MAT1512 (Calculus A) alongside this module.

5 LECTURER(S) AND CONTACT DETAILS

5.1 Lecturer(s)

The primary lecturer for this module is:

Lecturer: Dr LC Masinga
Department: Mathematical Sciences
Telephone: 011 670 9153
E-mail: masinlc@unisa.ac.za

A notice will be posted on *myUnisa* if there are any changes and/or an additional lecturer is appointed to this module.

Please do not hesitate to consult your lecturer whenever you experience difficulties with your studies. You may contact your lecturer by phone or through correspondence or by making a personal visit to his/her office. **Please arrange an appointment in advance (by telephone or by e-mail) to ensure that your lecturer will be available when you arrive.** Please come to these appointments well prepared with specific questions that indicate your own efforts to have understood the basic concepts involved. If these difficulties concern exercises which you are unable to solve, you must send us your attempts so that we can see where you are going wrong.

If you should experience any problems with the exercises in the study guide or prescribed book, your lecturer will gladly help you with them, provided that you send in your bonafide attempts. **When sending in any queries or problems, please do so separately from your assignments and address them directly to your lecturer.**

5.2 Department

You can contact the Department of Mathematical Sciences as follows:

> Department of Mathematical Sciences
> Departmental Secretary: 011 670 9147 (RSA)   +27 11 670 9147 (International)
> e-mails: mathsciences@unisa.ac.za   or   swanem@unisa.ac.za

5.3   University

To contact the University for any administrative and other matter not related to the content of this module, follow the instructions on the Contact us page on the Unisa website.

Contact addresses of the various administrative departments appear on the Unisa website: http://www.unisa.ac.za/sites/corporate/default/Contact-us/Student-enquiries

Please include the student number in all correspondence with the university.

Whenever you contact a lecturer via e-mail, please include your student number in the subject line to enable the lecturer to help you more effectively.

6   RESOURCES

6.1   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.

6.2 Prescribed book(s)

The prescribed textbook for this module is

Title:	**Numerical Analysis**
Author:	**R.L. Burden, D.J. Faires, A.M. Burden**
Edition:	**10th Edition**
Publishers:	**CENGAGE Learning**
Year:	2016
ISBN:	978-1-305-25366-7

Please buy the textbook as soon as possible since you have to study from it directly - you cannot do this module without the prescribed textbook. Van Schaik's bookstore is one of the official university textbook suppliers. This bookstore has a link to purchase electronic versions of some of the textbooks online. You are advised to explore this route of purchasing the textbook so you can not experience any delays in purchasing the textbook.

Please also note that having the prescribed edition of the textbook is of essence and cannot be replaced with alternative editions. Any textbook reference used in supplementary study material is to the 10th edition. Besides using this textbook for this module, it also covers topics included in the sequel module, which you may find very resourceful.

In case you have a delay in obtaining the official textbook, you want to access the online version of the 9th edition to keep up with your work. Note, however, that the two editions are not identical. So the online 9th edition **IS NOT** a replacement for the 10th edition which you should purchase.

Please refer to the list of official booksellers and their addresses in the *Study @ Unisa* brochure. Prescribed books can be obtained from the University's official booksellers. If you have difficulty in locating your book(s) at these booksellers, please contact the Prescribed Book Section at Tel: 012 429-4152 or e-mail vospresc@unisa.ac.za.

6.3 Recommended book(s)

There are no recommended books on the electronic e-reserves for this module.

Purchasing the prescribed textbook early is very critical as ALL the content of the curriculum is based on it. In the event that you may not be able to purchase the textbook in time to start working on the assignment, You may consider accessing the 9th edition of the textbook which is available online (also downloadable) to use temporarily. It is not recommended that this edition should replace the 10th edition since there may be updates in the organisation of the prescribed version. Any reference to the textbook is with respect to the 10th edition.

6.4 Electronic reserves (e-reserves)

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

6.5   Library services and resources

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

- For a general Library overview, go to
  https://www.unisa.ac.za/library/libatglance

  Library @ a glance

- For detailed Library information, go to
  https://www.unisa.ac.za/sites/corporate/default/Library

- 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

  http://www.unisa.ac.za/sites/corporate/default/Library/Library-services/Research-support

- 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 available at http://libguides.unisa.ac.za
Recommended guides:

- Request and find library material/download recommended material:

  http://libguides.unisa.ac.za/request/request

- Postgraduate information services: http://libguides.unisa.ac.za/request/postgrad

- Finding and using library resources and tools:
  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 databases:

  https://libguides.unisa.ac.za/az.php

Important contact information:

- Ask a librarian: https://libguides.unisa.ac.za/ask

- Technical problems encountered in accessing library online services:
  Lib-help@unisa.ac.za

- 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

7   STUDENT SUPPORT SERVICES

The *Study @ Unisa* website 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 with regard to 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: mymodules22@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-qa.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.

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8   STUDY PLAN

Your study plan of the module is outlined below. Please refer to the general management and planning skills guidelines in the Studies @ Unisa Brochure for further details.

The study plan below shows the content to be covered during specific periods of the year in terms of the broad concepts or topics, the study guide units and the prescribed book chapters. Your studies will be largely guided by the tutorial discussions and learning activities, and the assignments, which are all based on the same study plan. You should therefore participate as much as possible in the tutorial discussions and complete assignments and the learning or self-assessment activities linked to each topic in order to do well in the assignments, and for you to be well prepared for the final examination.

Note that Assignment 1 is the compulsory assignment and it might include other parts of the units in the prescribed book or the study guide, please don't be surprised to see questions from different units.
The sections of the tenth edition that are prescribed for examination purposes are as follows:

- **Chapter 2:** Sections 2.1 - 2.6 (Solutions of Equations in One Variable);

- **Chapter 3:** Sections 3.1 - 3.7 (Interpolation and polynomial approximation);

- **Chapter 4:** Sections 4.1 - 4.9 (Numerical Differentiation and Integration);

- **Chapter 6:** Sections 6.1 - 6.5 (Direct Methods for Solving Linear Systems);

- **Chapter 7:** Sections 7.1, 7.3 - 7.5 (Iterative Techniques for Linear Syatems);

- **Chapter 8:** Section 8.1 (Discrete Least Squares Approximation);

- **Chapter 10:** Section 10.2 (Newton's Method for Systems of Nonlinear Equations)

Although listed in this sequence, the textbook suggests a plan of going through the syllabus for a coherent flow of concepts. (see Preface of the textbook)

In addition to the textbook you should also study the following:

- *Tutorial Letter 102,* the use of which we discuss in the preface.

- *Additional resources,* which may contain a diversity of material deemed fit to enhance your study. You are advised to check the Additional Resources folder of the *my*Unisa module site for material that is uploaded from time to time. This folder contains additional material like *Lecture Notes* and/or *Lessons* and any material aimed at enhancing your study journey.

- *Tutorial Letters*, which include detailed discussions and model solutions of the assignments. The assignments and the corresponding tutorial letters are important since they give you an idea of what is expected of you with regard to the *types of problems* to be solved, and their *solutions*. Please note, however that you should not rely solely on the tutorial letters for your exam preparation. The examination covers the whole syllabus, theory as well as practice, and you should prepare accordingly. We also give *additional explanations* in these letters.

Year Module

Assignment (Due date)	Textbook - (10th ed.)
1 (15/04)	**Study** Chapters 1 and 2
2 (tba)	**Study** Chapters 6 and 7
3 (tba)	**Study** Chapters 3 and 8.1
4 (tba)	**Study** Chapters 4 and 10.2
Exam	Revise all chapters

Table 1: Suggested study programme for APM2613 Year module

The tutorial letters are uploaded to the module website in the course of the year as they become available and will also be downloadable from the internet via *ny*Unisa module site. It is important to check *my*Unisa regularly for announcements and allerts to new material.

- *Inventory for the current academic year* that you receive on registration and which lists the items available from the *my*Unisa module site at the time of registration. Please check the tutorial matter you have received against this inventory.You should also look for study resources in **myUnisa** as the official Teaching and Learning platform for the ODeL model.

You should read the entire Tutorial Letter 102, before working through the textbook. You should work through the sections of the prescribed textbook in the order indicated in Table 1 and submit assignments 1 to 4 by the respective due dates as indicated in this Tutorial Letter.

See the brochure *Study @ Unisa* for general time management and planning skills.

8.1 Suggested Study Programme

Here is a broad outline of how to plan your study programme:

- *Tutorial Letter 102*, to be studied in addition to the textbook, the use of which we discuss in its preface.

- *Suggested Study Programme*
  The structure of the assignments will be as outlined in Table 1.

You should read the entire tutorial letter 102, before working through the textbook. You should work through the sections of the prescribed textbook in the suggested order and submit assignments 1, 2, and 3 before the respective due dates.
See the brochure **Study @ Unisa** for general time management and planning skills.

9   HOW TO STUDY ONLINE?

9.1   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 (assessments) must be submitted online**. This means that you will do all your activities and submit all your assignments on myUnisa. In other words, you do **NOT** post your assignments to Unisa using the South African Post Office. You do **NOT** send assignments by email as such will not be considered for marking or a zero mark will be awarded.

- **All communication between you and the University happens online.** Lecturers will communicate with you via e-mail and **Chats**, **Discussions**, **Blogs**, and use the **Announcements**, the **FAQs**, the **Discussion Forums** and the **Questions and Answers** tools. You can also use all of these platforms to ask questions and contact your lecturers.

9.2   *m*yUnisa tools

The main tool that we will use is the **Lessons tool**. This tool will provide the content of and the assessments for your module. At times you may be directed to join discussions with fellow students and complete activities and assessments before you can continue with the module.

It is very important that you log in to myUnisa regularly. We recommend that you log in at least once a week to do the following:

- **Check for new announcements**. You can also set your myLife e-mail account so that you receive the announcement e-mails on your cellphone.

- **Check for new Chats**. You can also set your myLife e-mail account so that you receive the chats on your cellphone.

- **Do the Discussion Forum activities**. When you do the activities for each learning unit, we want you to share your answers with the other students in your group. You can read the instructions and even prepare your answers offline, but you will need to go online to post your messages.

- **Do other online activities**. For some of the learning unit activities you might need to post something on the **Blog tool**, take a quiz or complete a survey under the **Self-Assessment** tool. Do not skip these activities because they will help you complete the assignments and the activities for the module.

We hope that by giving you extra ways to study the material and practise all the activities, this will help you succeed in the online module. To get the most out of the online module, you **MUST** go online regularly to complete the activities and assignments on time.

10 ASSESSMENT

There are FOUR assignments (formative assessment) and one examination (summative assessment) for this module.

10.1 Assessment criteria

Specific Outcome 1:
Be able to draw a rough graph of any given function.

Assessment criteria

- Ability to extract relevant information for a function, including existence, discontinuities, singularities, symmetries, boundedness, behaviour at very small and very large values of x, behaviour at 0, roots and zeros, turning points, etc.

Specific Outcome 2:
Be able to solve different nonlinear equations using different numerical methods and interpret the results.
Numerical techniques include (but are not limited to) bisection, fixed-point iteration, Newton's method and its extensions: secant and regula falsi methods, analysis of convergence and error, zeros of polynomials and Muller's method.

Assessment criteria

- give a mathematical formulation of a method;

- identify and understand the meaning of terms in a formulated method;

- perform a few iterations of a numerical method;

- study convergence of a numerical method;

- estimate error of approximation ...

Specific Outcome 3:
Be able to solve sets of equations using different numerical methods.
Methods include (but are not limited to) Gaussian elimination, pivoting strategies and matrix factorisation, Jacobi, Gauss-Seidel and *SOR* iterative techniques, Newton's method for functions of several variables.

Assessment criteria

- give a mathematical formulation of a method;

- identify and understand the meaning of terms in a formulated method;

- perform a few iterations of a numerical method;

- study convergence of a numerical method;

- estimate error of approximation ...

Specific Outcome 4:
Be able to construct interpolating polynomials and fit curves to given data.
Methods include (but are not limited to) interpolation and Lagrange polynomials, difference methods, Hermite interpolation, cubic splines, parametric curves, data approximation, discrete least squares approximation.

Assessment criteria

- give a mathematical formulation of a method;

- identify and understand the meaning of terms in a formulated method;

- estimate error of approximation ...

Specific Outcome 5:
Be able to perform numerical differentiation and integration.
Methods include (but are not limited to)

- **Differentiation:** forward difference, backward difference, centered difference and their various refinements;

- **Integration:** trapezoidal rule, Simpson's rules, mid-point rule, Gaussian quadrature, ... (standard, composite, mixed, ... formats)

Assessment criteria

- give a mathematical formulation of a method;

- identify and understand the meaning of terms in a formulated method;

- estimate error of approximation ...

10.2 Assessment plan

Please note that this module has a total of **FOUR** assignments consisting of TWO Quizes (multiple–choice) assignments (01 and 04) and TWO written assignments (02 and 03).

- To complete this module, you will be required to submit four (4) formative assessments (assignments) and a summative assessment (exam).

- 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 at least one compulsory assignment.

- The assignment weighting for the module is 30 %.

- The examination will count 70% towards the final module mark.

- 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.

10.3 Formative and Summative Assessment

Assessment of this module comprises of both formative in the form of assignments, and summative assessment in the form of a written examination.

Note that your marks for the assignments contribute 30% to your final mark (the remaining 70% is contributed by the final examinations).

A final mark of at least 50% is required to pass the module. If a student does not pass the module then a final mark of at least 40% is required to permit the student to access the supplementary examination.

The final mark for the module comprises the formative/semester mark and the examination mark. The final mark composition is as follows:

Formative Assessment

The assessments together with the contributions of assignments to the year mark are as follows:

Assignment	Format	Weight (%)	Due date
01	Online(MCQ)	25	see myUnisa
02	Written	25	see myUnisa
03	Written	25	see myUnisa
04	Online (MCQ)	25	see myUnisa
Total		100	

The Written assignments can only be submitted online electronically through *my*Unisa.

Summative Assessment

There will be a written examination administered online. The details of the dates and duration are published on the myUnisa sites.

Final Mark

The final mark will be a composition of the semester mark and the examination mark, composed as follows:

Type of assessment	Contribution to the final mark (%)
Formative	30
Summative	70
Final mark total	100

Example A student obtains the following marks:
Assignment 01: 55%
Assignment 02: 100%
Assignment 03: 65%
Assignment 04: 76%
Exam: 58%

The year (formative) mark is

$$\frac{(55 + 100 + 65 + 76) \times 25}{100} = 74\%$$

The final mark for the module is

$$\left(\frac{30}{100} \times 74 + \frac{70}{100} \times 58 \right), \quad \text{i.e. } (22.2 + 40.6 = \mathbf{62.8} = 63)$$

Please note that the 30% contribution by the assignments makes it extremely important that you do all the assignments and score high marks, otherwise it is difficult for you to pass the module.

*Because this is an online module, not all the assignments are provided in this tutorial letter. Instead, the assignments are provided online as they become due. You will see them when you go online.

For each assignment there is a **FIXED CLOSING DATE**; the date by which the assignment **must be uploaded** to the university system.

Feedback for each assignment are labeled as Tutorial Letter 201, ..., 204 in line with the assignment number

Feedback to Assignments	Tutorial Letters
01	201
02	202
03	203
04	204

Late assignments will be marked, but will be awarded 0%.

10.4 Assessments 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.

10.5 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 https://my.unisa.ac.za. 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 (Quiz), some tests, others written assessments (assignments), some forum discussions, and so on. All assessments must be completed on the assessment shells available on the respective module platforms.

- To complete quiz (MCQ) 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 at all 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.

You only submit your assignments electronically via *myUnisa*. Assignments can **not** be submitted by fax or e–mail nor by post as such will not be considered for marking.

10.6 The assessments

As indicated earlier, to complete this module you need to complete 4 assessments for this module, two multiple–choice (Quiz) assessments and two written assessments.

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.

Make sure that you do the correct assignments.

Solutions will be available on *myUnisa* under Additional Resources before the examination date.

10.7 Other assessment methods

There may be other assessment methods for this module. These will be communicated in the course of the delivery of the course.

10.8 Examination admission.

Please note that lecturers are not responsible for examination admission, and ALL enquiries about examination admission should be directed by e-mail to exams@unisa.ac.za

> **You will be admitted to the examination if and only if the compulsory assignment(s) is/are submitted before the exam admission date**

10.9 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.

If you are registered for this module in 2024 then you will write the examination in **October/November 2024**.

Please note:

- The exam is a two hour examination.

- The use of a (non-programmable) pocket calculator is permitted during examination. You are **NOT** allowed to use a programmable calculator or the computer during the examination.

- ALL matters pertaining to examinations are handled by the Examinations Department. Lecturers are NOT responsible for examination timetabling, results (including the granting of supplementary opportunities, aegrotats) and such matters. See the *Study @ Unisa* brochure for more information relating to examinations and what to do in the various circumstances.

10.10 Supplementary

If you are registered for this module in 2024 then you will write the supplementary examination in **January/February 2025**.

During the course of the year, the Examination Section will provide you with information regarding the examination in general, examination websites, examination dates and examination times and that including the supplementary examination.

11 ACADEMIC DISHONESTY

11.1 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.

11.2 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 (including formative assessments), 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).

11.3 For more information about plagiarism, follow the link below:

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

12   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 your lecturer to discuss the assistance that you need.

13   FREQUENTLY ASKED QUESTIONS

The *Study @ Unisa* brochure contains an A-Z guide of the most relevant study information.

14   SOURCES CONSULTED

The prescribed textbook and various university guidelines were consulted in preparing this tutorial letter.

15   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 LC Masinga – lecturer for APM2613
Department of Mathematical Sciences

ADDENDUM A: Additional Notes and Curriculum Transformation

Note that it is crucial to understand the content of this module in order to be able to properly do your assignments on your own and solve related problems. For this purpose, video notes will be uploaded under Additional Resources of the main module. In order to fully understand the concepts of this module and benefit from this course, you can request a MS Teams meeting for live discussions with the lecturer where recordings and video notes can be made available to your fellow students as well.

Note that the lecturers for this module may provide live discussions on Teams about the concepts in order to facilitate the understanding for this module.

ADDENDUM B: Assignment 01

The multiple-choice assignments will be marked by computer. Hence the closing date is fixed and no extension of time can be granted.

Before you attempt enter your answers, please study in detail the relevant chapter of the publication My Studies @ Unisa.

Note that your assignment will not be returned to you. Please keep a record of your answers so that you can compare them with the worked out solutions.

COMPULSORY ASSIGNMENT FOR THE EXAM

ASSIGNMENT 01
Due date: Wednesday, 19 April 2023

ONLY FOR YEAR MODULE

This assignment covers **Chapters 1 and 2 of the prescribed textbook** - background knowledge and nonlinear equations.

IMPORTANT

- This is will be a multiple choice assignment. **ALL** the questions must be answered. The only way to submit the assignment is online, using *my*Unisa.

- Keep your rough work so that you can compare your solutions with the feedback that will be provided later on *my*Unisa.

- 10 marks will be awarded for every correct answer. There may be part marks for certain answers.

- You can use Matlab/Octave to help you with computations.