Tutorial Letter 101/3/2018

Elementary Quantitative Methods

QMI1500

Semesters 1 and 2

Department of Decision Sciences

This tutorial letter contains important information about your module.

Bar code

Contents

1 INTRODUCTION AND WELCOME

Dear Student

We are pleased to welcome you to the module QMI1500 and hope that you will find it both interesting and rewarding. We shall do our best to make your study of this module successful. You will be well on your way to success if you start studying early in the semester and resolve to do the assignments properly.

In this module you will learn useful mathematical skills that will enable you to solve practical problems. You will learn how beautiful and elegant numbers can be and what fun it is to work with them. So if you are frightened of numbers, this module is going to help you get rid of your fears. It will, however, not happen overnight - one has to work hard and do lots of exercises to master mathematics.

Learning to do mathematics is like building a wall - one brick fits on top of the other. So make sure that you are familiar with one section of the work before moving on to the next. We hope that we will enjoy a happy and successful semester together.

Getting started with QMI1500, you have to

- **register as a user on myUnisa as soon as possible** if you not done so yet.
  Go to `https://my.unisa.ac.za` to start the process. The first link on top on the right-hand side, "Claim UNISA Login", will take you through the registration steps. On myUnisa you will be able to download all your study material electronically, submit your assignments and update your bibliographical details.

- ensure you can access your myLife email account.
  During the registration process on myUnisa, you will also be given access to myLife, a web-based email system for Unisa students. All email correspondence will be sent to your myLife email account. Therefore, you have to **access your myLife email account regularly** or even better, forward all your myLife emails to an email account you use daily. (If you do not know how to forward your myLife emails, google for instructions.)

- check if your cellular number is correct.
  Unisa sends announcements to you by SMS. You can update your contact details by logging in on myUnisa, clicking on MyAdmin tab, "Bibliographical Details". Next click on the top tab "Update Contact Details".

- check if your examination centre is correct.
  Changes in examination venues must be done before 31 March 2018 (semester 1) or 31 July 2018 (semester 2). Again, log in on myUnisa, clicking on the MyAdmin tab then choose, "Bibliographical Details". Next click on the top tab "Update Examination Centre".

After you have completed the four steps above, you are ready to start studying *immediately* and *regularly* to complete the module within the given time frame. All your study material is available on myUnisa on the QMI1500 web page under "Official Study Material" and "Additional Resources".

Start your QMI1500 studies by carefully reading through the rest of this tutorial letter. Then return to the proposed study schedule, which would guide you through your study material.

2 SYLLABUS: PURPOSE AND OUTCOMES

2.1 Purpose

The purpose of this module is to introduce the student to elementary mathematical modelling, elementary descriptive statistics, index numbers and financial mathematics.

2.2 Outcomes

2.2.1 *Learning Outcomes 1: Numbers and Working with Numbers*

Students can demonstrate an understanding of numbers and working with numbers.

Assessment criteria:

(a) Know and apply the priority rules, laws of operations, basic signs and notations and counting rules in solving problems.

(b) Express relationships between numbers by using symbols.

(c) Do basic mathematical operations on fractions.

(d) Solve problems containing roots and/or powers.

(e) Relate numbers to each other using ratios, proportions and percentages.

(f) Convert units and measures of length, distance, area and volume.

2.2.2 *Learning Outcome 2: Collection, presentation and description of data*

Students can apply the basic techniques of descriptive statistics to a small data set.

Assessment criteria:

(a) Explain a few simple sampling techniques.

(b) Represent the data graphically using histograms, pie charts, cumulative frequency polygons and stem-and-leaf diagrams.

(c) Distinguish between qualitative and quantitative data.

(d) Set up a frequency table.

(e) Calculate the mean, the mode and the median of a data set.

(f) Calculate the variance, standard deviation, quartile deviation and coefficient of variation of an unordered data set.

(g) Calculate the variance and standard deviation of a data set ordered in intervals.

(h) Draw and interpret a box-and-whiskers diagram of an unordered data set.

2.2.3 *Learning Outcome 3: Index numbers and transformations*

Students can calculate simple index numbers and perform transformations.

Assessment criteria:

(a) Calculate quantity, value and price indices.

(b) Calculate the purchasing power of money in a specific period.

(c) Calculate an exchange rate.

(d) Do transformations and calculations with a fine ounce of gold.

(e) Calculate a growth rate.

2.2.4 *Learning Outcome 4: Functions and representations of functions*

Students can apply mathematical concepts to do basic modelling.

Assessment criteria:

(a) Explain the concept of a function.

(b) Differentiate between linear, quadratic, exponential and logarithmic functions.

(c) Explain the different characteristics of linear and quadratic functions.

(d) Represent linear and quadratic functions graphically.

2.2.5 *Learning Outcome 5: Linear systems*

Students can apply mathematical concepts to solve linear inequalities in one or two variables.

Assessment criteria:

(a) Solve linear inequalities and linear equations in one or two variables algebraically.

(b) Solve a system of linear inequalities in one or two variables graphically.

2.2.6 *Learning Outcome 6: An application of differentiation*

Students can apply elementary differentiation rules.

Assessment criteria:

(a) Calculate and interpret the marginal profit at a specific production level.

(b) Calculate and interpret the marginal cost at a specific production level.

2.2.7 *Learning Outcome 7: Mathematics of Finance*

Students can apply the basic concepts of financial mathematics to solve elementary practical financial problems.

Assessment criteria:

(a) Calculate simple interest, simple discount and compound interest.

(b) Give and apply the equations and the corresponding time lines relating present and future values of money when compounding is applicable.

(c) State and apply the two rules for moving money backward and forward in time.

(d) Use the rules to replace one set of financial obligations with another, that is, reschedule debts.

(e) Explain the basic structure and elements of an annuity.

(f) Determine the present value and future value of an annuity.

(g) Calculate the payments on a mortgage loan.

(h) Set up an amortisation schedule for a loan.

(i) Reschedule payments on a loan for changes in interest rate or term.

(j) Manipulate the formula in order to obtain expressions for the specific variables.

3 LECTURER(S) AND CONTACT DETAILS

3.1 Lecturer(s)

The lecturer(s) for QMI1500 will assist you if you experience any difficulties regarding the study material. Do not hesitate to contact them, but please make an appointment if you want to see them personally.

Information about your lecturer(s) is available in the Welcome message on the module site QMI1500-18-S1/QMI1500-18-S2.

All queries about the content of this module should be directed to us. Please have your study material with you when you contact us.

3.2 Department

If you need assistance regarding the study material and cannot reach your lecturer, you may contact one of the secretaries in the department, at:

Telephone:	012 433-4684
	012 433-4722
E-mail:	qm@unisa.ac.za

3.3 University and College

If you need to contact the University about matters not related to the content of this module, please consult Study@Unisa brochure. This brochure contains contact information regarding different administrative matters. You can also obtain contact information from the Unisa website http://www.unisa.ac.za under "contact us" (the last tab on the top row of tabs). Remember to include or quote your student number when you contact the University.

For college related queries, you can contact Ms Portia Ngcobo, the Information Coordinator of the College of Economic Sciences at:

Telephone: 012 429-3925
E-mail: CEMSenquiries@unisa.ac.za

4 STUDENT SUPPORT SERVICES

4.1 Face-To-Face Tutors

Face-to-face tutoring involves face-to-face **contact sessions between the students and the tutor**, that means students meet with their tutors in a classroom setup, at designated venues and at specific times at the **Unisa Regional Learning Centres**. Face-to-face tutors are qualified experts who are practitioners and specialists in the subjects in which they are appointed to be face-to-face tutors.

To join face-to-face tutorials you need to go to the Unisa Regional Learning Centre nearest to you to enroll for tutorials. The regional offices will supply you with the dates, place and times of the sessions for the modules you had enrolled for. Note that not all Regional offices present tutor classes.

4.2 E-tutors

E-tutoring entails the delivery of **teaching and learning online via the internet**. An e-tutor is the person who undertakes the role to support and enable students to learn online effectively. E-tutors are qualified experts who are practitioners and specialists in the subjects in which they are appointed to be e-tutors.

E-tutors will be assigned to groups students after the registration process has ended. Students will receive a system generated mylife e-mail notification, informing them that they are allocated to an e-tutor. To access your tutor, log on to myUnisa and you will find an additional module tab with the module code. Once you have opened the additional module tab you can start communicating with your e-tutor through the discussion forum or other communication tools available on the group site as prescribed.

5 STUDY PLAN

There are about four months of study time in a semester. In this short period of time you have to work through the study material, do the assignments and prepare yourself for the examination. You will therefore have to plan carefully.

Since this module is of a mathematical nature you will need to work consistently throughout the semester to master it. We suggest that you spend at least 45 minutes per day on this module.

5.1 Study Material

Please check the study material consists of seven topics that are contained in SG001 that you should have received with registration. The following table shows the topics in SG001:

Chapter	Topic
1	Numbers and working with numbers
2	Collection, presentation and description of data
3	Index numbers and transformations
4	Functions and representations of functions
5	Linear systems
6	An application of differentiation
7	Mathematics of finance

You might find some topics easier than others and will need less time to master them. It is therefore not possible to set a restriction on the time you should spend on each topic. It would, however, be wise not to spend more than two weeks on a topic.

Start your studies as soon as possible to enable you to cover the module and have enough time to study for the examination.

To help you master the work in this module, we supply you with additional exercises in the form of a *workbook*.

5.2 Workbook

The SG002 document that you can download from myUnisa is a workbook containing additional exercises on each topic.

Do as many of the exercises in the workbook as possible. This will help you to master the topics sufficiently well and complete the module successfully.

5.3 Study Method

Buy a calculator as soon as possible and make sure you know how it works before you start with your studies. See the notes on using the recommended calculator in Tutorial letter 102 which are under "Additional Resources" on the module site.

We suggest that you start with Topic 1 in SG001. Work through each study unit and do the activities and exercises. Check your answers against the answers that are supplied.

The workbook provides extra exercises on every study unit. If you feel you need more practice on a certain part of the work, do these exercises. Complete and submit the assignment (before its due date) when you have covered its relevant topics.

6 ASSESSMENT

6.1 Assignments

Assignments are an integral part of the learning material for this module. There are three compulsory assignments per semester.

Note the following:

(a) All three assignments are compulsory.

(b) You must submit the compulsory assignments to be allowed to write examination at the end of the semester.

(c) All assignment marks count toward your semester mark which counts 20% of your final mark for the module.

(d) All assignments consist of multiple-choice questions and must be completed on myUnisa. NO manual or posted submissions will be allowed.

(e) Ensure that your assignments are submitted by the due dates. Late submissions will not be accepted.

(f) To find out whether the University has received your assignment, go to myUnisa. (Your lecturer will not be able to give you this information.)

(g) All assignment documents can be found on the myUnisa course site, under "Additional Resources".

The following table shows for each assignment the due date, unique number, topic(s) it covers and its contribution to the semester mark (weight):

Assignment	**Due dates and unique numbers**				**Topic(s)**	**Weight**
	First semester		**Second semester**			
01	23 February 2018	758219	03 August 2018	860767	1, 2, 3	30%
02	23 March 2018	680827	27 August 2018	877229	4, 5, 6	35%
03	16 April 2018	862691	17 September 2018	808257	7	35%

6.1.1 *Submission of assignments*

To complete and submit an assignment via myUnisa, do the following:

- Log into myUnisa with your student number and password.
- Select the module (QMI1500).
- Click on Assessment info in the menu on the left.
- Click on the assignment number you want to submit.
- Follow the instructions on the screen.

6.1.2 *Feedback on Assignments*

You will receive the correct options for the multiple-choice questions automatically. These will also be available on myUnisa.

A tutorial letter containing solutions to each assignment will be posted on myUnisa after the due date.

Please check your answers after you have received the feedback. This is an important part of your learning experience and should help you to be better prepared for the next assignment and the examination.

6.2 Examinations

General guidelines for the examination, as well as guidelines for the preparation of the examination can be found in Study @ Unisa.

Also note the following:

- The Directorate: Student Assessment Administration will provide you with information regarding examination venues, examination dates and examination times.
- You will write a two-hour examination paper consisting of multiple-choice questions only.
- The paper must be answered on a mark-reading sheet with an HB pencil.
- A list of formulæ will be attached to the examination paper.
- Only your calculator, pen(s) and an HB pencil may be taken into the examination hall.
- The examination will cover all the study material.
- The use of a programmable calculator is permitted in the examination.
- The semester mark will contribute 20% towards your final mark, while the examination will contribute 80%.
- A subminimum of 40% applies to the examination. This means that if your examination mark is less than 40%, your semester mark will not be taken into account for your final mark. Your examination mark will then be your final mark.

7 FREQUENTLY ASKED QUESTIONS

For general questions, see Study @ Unisa.

The following are a few questions that are regularly asked:

1. Can I have the memoranda of the examination papers that are available on myUnisa? The memoranda are not given out. If you do the papers and you send your workings to your lecturer, he/she will return it to you with feedback.
2. I already have another calculator. Do I still have to buy the SHARP EL-738/738FB?

You may use any other financial calculator, but assistance will only be given for the SHARP EL-738/738FB.