Tutorial Letter 101/3/2018

CSP1501
Introduction to Applied Sciences

Semesters 1 and 2

Department of Life and Consumer Sciences

This tutorial letter contains important information about your module.
1 INTRODUCTION

Dear Student

Welcome as a student of the Introduction to Applied Sciences module! I hope that you will enjoy this module and put an effort into learning more about the basic sciences in whichever field you are studying. I wish you success in your academic endeavours.

2 PURPOSE AND OUTCOMES

2.1 Purpose

The purpose of the module is to enable you to identify and apply basic chemistry and physics principles in the interpretation of different sciences, including human nutrition, food processing and clothing and textiles. It will also enable you to identify various physiological systems and functions concerning the human body. Qualified students will have the basic knowledge to contribute to the promotion of basic lifestyle principles.

2.2 Outcomes

Qualified students have the ability to:

- demonstrate their understanding of the properties of matter, atoms and molecules, chemical bonding, gasses, oxidation and reduction, acids, bases and salts, as well as food systems
- measure matter, explain the principles of forces, electricity, diffusion, absorption, adsorption, osmosis, light, sound, heat and temperature
- describe human physiology in the context of human cells, body tissue, organs and systems, the skeletal, muscular, nervous, cardiovascular, respiratory, digestive and excretory systems
- integrate the abovementioned information in different fields of studies, such as nutrition, food processing and clothing and textiles

3 LECTURER(S) AND CONTACT DETAILS

3.1 Lecturer(s)

Your lecturer for CSP1501 is: Mr. F Ramasunga

For any subject related queries, please contact Mr. F Ramasunga

<table>
<thead>
<tr>
<th>My telephone number</th>
<th>+2711 471 2115</th>
</tr>
</thead>
<tbody>
<tr>
<td>My postal address</td>
<td>CSP1501 Lecturer</td>
</tr>
<tr>
<td></td>
<td>Department of Life and Consumer Sciences</td>
</tr>
<tr>
<td></td>
<td>Florida Campus, Block B</td>
</tr>
<tr>
<td></td>
<td>Private Bag X6</td>
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<td>Florida</td>
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<td></td>
<td>1710</td>
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<tr>
<td>My e-mail address</td>
<td><a href="mailto:ramasf@unisa.ac.za">ramasf@unisa.ac.za</a></td>
</tr>
<tr>
<td>myUnisa webpage</td>
<td>Go to: <a href="https://my.unisa.ac.za/portal/">https://my.unisa.ac.za/portal/</a></td>
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<tr>
<td></td>
<td>Log in and click on:</td>
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<tr>
<td></td>
<td>CSP1501-18-S1 (for semester 1) or</td>
</tr>
<tr>
<td></td>
<td>CSP1501-18-S2 (for semester 2)</td>
</tr>
</tbody>
</table>
Follow the procedures in the *my studies @ Unisa* brochure to become a user of myUnisa. On the left-hand side grey bar of the myUnisa site, you will find the option “Course Contact”. You will be able to e-mail me via the Course Contact option. Please have your study material and student number handy when you contact me with queries concerning the course.

The easiest way to contact lecturers is by e-mail (ramasf@unisa.ac.za). If you have sent an e-mail and do not receive a response within a few days, it is possible that the lecturer has not received your e-mail message, either because of computer server problems or because the lecturer is away on leave or attending a conference. In that case resend the e-mail; if you still do not get a reply, try another means of communication (see more details below). You are always more than welcome to contact us telephonically or to pay me a visit on the Florida campus.

### 3.2 Department

| 🗃 Secretary’s telephone number | +2711 471 2230 / 2292 |
| 📢 Departmental fax number      | +2711 471 2796 |
| College administrator’s e-mail address | CAESenquiries@unisa.ac.za |

### 3.3 University

**Unisa website:** [http://www.unisa.ac.za](http://www.unisa.ac.za) & [http://mobi.unisa.ac.za](http://mobi.unisa.ac.za)

**myUnisa:** [https://my.unisa.ac.za/portal](https://my.unisa.ac.za/portal) & [https://my.unisa.ac.za/portal/pda](https://my.unisa.ac.za/portal/pda)

**E-mail:** info@unisa.ac.za

**SMS:** 32695 (only for students in South Africa)

**Fax:** 012 429 4150

### 4 RESOURCES

#### 4.1 Prescribed books

Your prescribed book for this module is

- **Title:** *X-kit undergraduate: Physiology.*
- **Authors:** Buckle, M, Strauss, D, Engelbrecht, A, Ismail-Wesso, I, Knight, A, Mattheyse, M & Hewett, G.
- **Year published:** 2006.
- **Publisher:** Pearson Education South Africa (Pty) Ltd.
- **ISBN 10:** 1-86891-378-3
- **ISBN 13:** 978-1-868913-78-7

Prescribed books can be obtained from the university’s official booksellers. Please refer to the list of official booksellers and their addresses in the *my Studies @ Unisa* brochure.

If you have difficulty with locating your book at these booksellers, please telephone the prescribed book section at 012 429 4152 or e-mail vospresc@unisa.ac.za.

Note that the prescribed book for this module will **mainly** be used in the human physiology sections (therefore study units 11 to 20), but are referred to in the other study units as well. It is important that you study the sections of the prescribed book as indicated by this study guide thoroughly.
4.2 Recommended books

There are no recommended books for this module.

4.3 Electronic reserves (e-reserves)

There are no e-Reserves for this module.

4.4 Library services and resources information

For brief information, go to www.unisa.ac.za/brochures/studies

For detailed information, go to the Unisa website at http://www.unisa.ac.za/ and click on Library.

For research support and services of personal librarians, go to http://www.unisa.ac.za/Default.asp?Cmd=ViewContent&ContentID=7102.

The library has compiled a number of library guides:

- finding recommended reading in the print collection and e-reserves – http://libguides.unisa.ac.za/request/undergrad
- requesting material – http://libguides.unisa.ac.za/request/request
- postgraduate information services – http://libguides.unisa.ac.za/request/postgrad
- finding, obtaining and using library resources and tools to assist in doing research – http://libguides.unisa.ac.za/Research_Skills
- how to contact the library/finding us on social media/frequently asked questions – http://libguides.unisa.ac.za/ask

5 STUDENT SUPPORT SERVICES

The DCCAD supports prospective and registered students before, during and after their Unisa studies. There are resources on their website, and also printed booklets available to assist you with:

- career advice and how to develop your employability skills
- study skills
- academic literacy (reading, writing and quantitative skills)
- assignment submission and exam preparation.

Contact details

Website http://www.unisa.ac.za/counselling
E-mail for Counseling counselling@unisa.ac.za
E-mail for Academic Literacy acalit@unisa.ac.za

Further important information appears in your my studies @ Unisa brochure.
Science Foundation Programme

The Science Foundation Programme (SFP) is intended primarily to facilitate the academic development of students whose prior learning has not been satisfactory. SFP students are identified based on M-score counts during registration. A “Diagnostic test” has been created to enable Unisa staff to provide the identified students the type of support they need, for instance literacy, scientific writing, reasoning and so forth. CSP1501 has been identified as a high-risk module due to the scientific content of the module and because many students do not have any scientific background when enrolling for this module at Unisa. Once students have been identified (who might need assistance with completing this module) an e–tutor is assigned to these students to guide and assist their needs.

When you log into myUnisa you will find a link to this diagnostic test. Please complete this test as it is simply there to benefit you as the student. Once you have completed the diagnostic test and have been identified as a candidate that would need support from an e-tutor, you will be linked to an e-tutoring site on myUnisa. The e-tutor will provide facilitated activities to guide you through difficult concepts. However, the facilitation you receive from the e-tutor should not in any way overrule the communications you will receive from the lecturer of this module via the module’s mainstream myUnisa site.

6 STUDY PLAN

Find below a detailed study plan for this module. Please take note that this only gives you guidance and you can still work at your own pace. By following the plan for a semester, you can be assured that your assignments will reach us on time and that you will be prepared for the exam. Use the My studies @ Unisa brochure for general time management and planning skills. The Study and Assessment Plan for 2018 is as follows:

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
</table>
| 1    | S1: 27 Jan S2: 14 Jul | o Read through Tutorial Letter 101 thoroughly.  
  o Familiarise yourself with the assignments provided in your Tutorial Letter 101, for the semester you are registered for.  
  o Buy the prescribed book:  
    X-kit undergraduate: Physiology;  
  o Register on www.my.unisa.ac.za.  
  o Read through the Preface of the Study Guide thoroughly.  
  o Browse through the rest of the Study Guide to get familiar with the content.  
  o Browse through Tutorial Letter 301 – note information important for your assignments.  
  o Prepare for Assignment 01. |
| 2    | S1: 3 Feb S2: 21 Jul | o Start working on Assignment 01.  
  o Work through Study Unit 1: Properties of matter in the Study Guide.  
  o Work through Study Unit 2: Atomic structures and the periodic table of elements.  
  o Work through Study Unit 3: Chemical bonding. |
| 3    | S1: 10 Feb S2: 28 Jul | o Work through Study Unit 4: Oxygen and other gases.  
  o Work through Study Unit 5: Oxidation and reduction.  
  o Work through Study Unit 6: Acids, bases and salts.  
  o Complete Assignment 01.  
  o If ordinary post: Post Assignment 01 no later than this week. |
<table>
<thead>
<tr>
<th>Week</th>
<th>Due Date 1</th>
<th>Due Date 2</th>
<th>Assignments and Tasks</th>
</tr>
</thead>
</table>
| 4    | S1: 17 Feb | S2: 4 Aug | - Complete Assignment 01 no later than this week via my.unisa.ac.za.  
- Work through Study Unit 7: Measurement of matter.  
- Work through Study Unit 8: Forces between particles.  
- Work through Study Unit 9: Diffusion, osmosis, absorption and adsorption.  
- Work through Study Unit 10: Heat and temperature. |
| 5    | S1: 24 Feb | S2: 11 Aug | - Complete Assignment 02  
- Work through Study Unit 11: Basic units of life.  
- Work through Study Unit 12: The human cell.  
- Work through Study Unit 13: Body tissue.  
- If ordinary post: Post Assignment 02 no later than this week. |
| 6    | S1: 3 Mar  | S2: 18 Aug | - Complete Assignment 02 no later than this week via my.unisa.ac.za.  
- Work through Study Unit 11: Basic units of life.  
- Work through Study Unit 12: The human cell.  
- Work through Study Unit 13: Body tissue.  
- Work through Study Unit 14: Skeletal system.  
- Work through Study Unit 15: Muscular system.  
- Work through Study Unit 16: Nervous system.  
- Start working on Assignment 03. |
| 7    | S1: 10 Mar | S2: 25 Aug | - Work on Assignment 03.  
- Work through Study Unit 17: Cardiovascular system.  
- Work through Study Unit 18: Respiratory system.  
- Work through Study Unit 19: Excretory system.  
- Work through Study Unit 20: Digestive system. |
| 8    | S1: 17 Mar | S2: 1 Sep | - Complete Assignment 03.  
- If ordinary post: Post Assignment 03 no later than this week. |
| 9    | S1: 24 Mar | S2: 8 Sep | - Complete Assignment 03 no later than this week via my.unisa.ac.za.  
- Revise Study Units 1 – 6.  
- Work through the returned Assignment 01 and correct mistakes made. |
| 10   | S1: 31 Mar | S2: 15 Sep | - Revise Study Units 7 – 10.  
- Work through the returned Assignment 02 and correct mistakes made. |
| 11   | S1: 7 Apr  | S2: 22 Sep | - Revise Study Units 11 – 16.  
- Work through the returned Assignment 02 and correct mistakes made. |
| 12   | S1: 14 Apr | S2: 29 Sep | - Revise Study Units 17 – 20.  
- Work through the returned Assignment 03 and correct mistakes made. |
- Work through the FAQs posted on myUnisa in preparation for the exam.  
- Work through previous exam papers (see myUnisa).  
- Prepare for the exams. |
| 14   | S1: 28 Apr | S2: 13 Oct | - Prepare for the exams. |
| 15   | S1: 5 May  | S2: 20 Oct | - Prepare for the exams. |

### Examination Cycle Starts

#### 7 PRACTICAL WORK AND WORK-INTEGRATED LEARNING

There are no practical sessions for this module.
8 ASSESSMENT

8.1 Assessment plan

Assignments are seen as part of the learning process for this module. As you do the assignment, you should analyse and revise the study material provided to you, consult other resources, discuss the work with fellow students or do research on a specific concept in order for you to be actively engaged in your learning and to increase your skill set.

There are three assignments for CSP1501 for each semester. You will find the assignments, which you need to complete for the semester that you are registered for, in this tutorial letter for

- semester 1 (January to June) in appendix A for students registered in semester 1 and
- semester 2 (July to December) in appendix B for students registered in semester 2

It is compulsory to submit at least one assignment in order to be awarded examination admission. Important: Note that all assignments contribute to your final mark. Thus, even though not all of the assignments are compulsory, they are all equally important to assure the successful completion of this module. If you do not submit all of the assignments, your year mark will be very low and you might fail the module, even if you pass the exam. Therefore please familiarize yourself with the assessment plan below and note the percentage distribution of each assignment, contributing to the final mark. Please note that assignment 03 contribute 80% of your year mark.

<table>
<thead>
<tr>
<th>Summary of YOUR responsibilities for CSP1501:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Study each study unit</td>
</tr>
<tr>
<td>- Send comments on study package and assessment to lecturer</td>
</tr>
<tr>
<td>- Complete assignments and submit in time</td>
</tr>
<tr>
<td>- Prepare for examination</td>
</tr>
<tr>
<td>- Write exams</td>
</tr>
</tbody>
</table>

Formative assessment:
- Assignment 1 (10% of year mark)
- Assignment 2 (10% of year mark)
- Assignment 3 (80% of year mark)

Year mark (30% of final mark) = Final mark

Summative assessment:
- Examination

Exam mark (70% of final mark)
8.2 Assignment numbers

8.2.1 General assignment numbers

Assignments are numbered consecutively per module, starting from 01 to 03.

8.2.2 Unique assignment numbers

Please supply the unique assignment numbers provided in the table below in the assigned places

<table>
<thead>
<tr>
<th>Assignment Number</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unique Number</td>
<td>Unique Number</td>
</tr>
<tr>
<td>01</td>
<td>897531</td>
<td>836105</td>
</tr>
<tr>
<td>02</td>
<td>657153</td>
<td>822564</td>
</tr>
<tr>
<td>03</td>
<td>752714</td>
<td>853451</td>
</tr>
</tbody>
</table>

8.3 Assignment due dates

The following due dates have to be adhered to for submission of assignments:

<table>
<thead>
<tr>
<th>Assignment Number</th>
<th>Semester 1</th>
<th>Semester 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Due Date</td>
<td>Due Date</td>
</tr>
<tr>
<td>01</td>
<td>02 March 2018</td>
<td>10 August 2018</td>
</tr>
<tr>
<td>02</td>
<td>16 March 2018</td>
<td>24 August 2018</td>
</tr>
<tr>
<td>03</td>
<td>03 April 2018</td>
<td>07 September 2018</td>
</tr>
</tbody>
</table>

8.4 Submission of assignments

Note that for Assignments 01 to 02 (the multiple-choice assignments), you have three options on how you can submit these assignments:

1. on completed mark-reading sheets by post or
2. by completing the Mobile MCQ submission or
3. by completing the MCQs electronically via myUnisa.

For detailed information on submitting your assignments, please refer to the my studies @ Unisa brochure, which you received with your study package. To submit an assignment via myUnisa:

- Go to myUnisa.
- Log in with your student number and password.
- Select the module.
- Click on “Assignments” in the menu on the left-hand side of the screen.
- Click on the assignment number you wish to submit.
- Follow the instructions.

8.5 The assignments

Unisa is implementing onscreen marking of assignments to help you receive quicker feedback on your assignments. This will not be the case for all your modules, however, most modules from the Department of Life and Consumer Sciences can be marked this way.
Please submit your assignment as a PDF document and not in another format (e.g. MS Word or Excel). By doing this you will ease the marking process and ensure we receive the document you finalised. Furthermore, there is the likelihood that unintended alterations could be made to a Word document once submitted, however with a PDF document no changes can be made to content (it will only receive marks and comments).

It is very easy to convert a document to PDF. Use these easy steps:

1. **Convert your electronic assignment to PDF format.**
   
   **How do I create a PDF document from any other document format (e.g. MS Word, MS Excel etc)?**
   
   By quickly downloading FREE software (namely PrimoPDF), you can create a PDF document from any type of document you can print. Follow these easy steps:
   
   i. Go on the internet to the following website: [http://www.primopdf.com/index.aspx](http://www.primopdf.com/index.aspx)
   
   ii. Download the PrimoPDF software by clicking on the DOWNLOAD FREE prompt. Follow the instructions for installing the software.
   
   To create a PDF document from your assignment, go to your assignment on your PC and instead of printing your assignment to an actual printer, choose PrimoPDF as
   
   i. printer. To do this, click on the Microsoft Office Button (or “File” button for other versions of Microsoft), and click Print. Then choose from the drop-down list on the printer, which in this case should be **PrimoPDF**.
   
   ii. You will now receive a pop-up message. Click the “Create PDF” button. Indicate in the “Save as:” pop-up where you want to save the PDF assignment on your PC.
   
   iii. The PDF version of your assignment will now appear for your viewing.

2. **Submit the PDF document (your assignment) via myUnisa (online).** For guidance on how to submit an assignment via myUnisa, see section 8.4 of this tutorial letter or the my studies @ Unisa brochure.

8.6 **Other assessment methods**

There are no other assessment methods for this module.

8.7 **The examination**

For general information and requirements as far as the examination is concerned, see the brochure my studies @ Unisa which you received with your study material. For examination admission it is compulsory for you to hand in this module’s first assignment for the semester you are registered for. It is also to your own advantage to do the assignments in order to test your understanding of the subject, and to establish how well prepared you are for the examination. The assignments also contribute to your year mark (see section 8 of this tutorial letter). You need to obtain a minimum of 40% in your examination to pass. If you failed to do that your year mark will not count and only the less than 40% mark will reflect on your academic record.

This module is offered in a semester period of 15 weeks. This means that if you are registered for the first semester, you will write the examination in May/June 2018 and the supplementary examination will be written in October/November 2018. If you are registered for the second semester you will write the examination in October/November 2018 and the supplementary examination will be written in May/June 2019.
9 FREQUENTLY ASKED QUESTIONS

Please refer to the my studies @ Unisa brochure which contains an A-Z guide of the most relevant study information.

10 SOURCES CONSULTED

The following websites, articles and textbooks were consulted in the compilation of this tutorial letter:


11 IN CLOSING

This module is packed with 20 study units to work through, study and master by completing all the assignments and examination. This can only be done successfully if you are keen to learn as well as self-motivated and determined to study. As a Unisa student, you are part of an open distance learning (ODL) institution. Therefore it is expected of you to visit myUnisa frequently and to correspond with us, your lecturers, not only to stay on course with your studies, but also to increase your efficiency in your academic accomplishments by clarifying any uncertainties you might encounter during your studies.

All of the best with your studies and enjoy this learning experience!

Warm regards,

Mr. Fhumulani Ramasunga

12 ADDENDUM

Assignments
ADDENDUM A: Assignments for Semester 1

Assignment 01

Due date: 02 March 2018

Unique assignment number: 897531

Semester period: 01

INSTRUCTIONS

1) Answer this assignment if you are registered for semester 1.

2) Read section 8 of this tutorial letter before starting this assignment.

3) This assignment contains only multiple-choice questions (MCQs).

4) The purpose of this assignment is to familiarise you with study units by means of techniques designed to improve your study skills. These techniques, namely skimming, scanning and study-reading, are discussed in your study guide in the Preface. Read it thoroughly before starting this assignment. This assignment thus focuses on the study guide only.
Question 1: Multiple-choice questions

1.1 The physical state in which the particles have an extreme disorder, have almost complete freedom to move and take the shape and volume of the container, is what state?
   1 Liquid
   2 Gas
   3 Solid
   4 None of the above

1.2 Matter can change in its physical state of being a solid, liquid or gas. When water changes from ice (solid) to steam (gas), the process is called:
   1 Sublimation
   2 Deposition
   3 Freezing
   4 Evaporation

1.3 The number of protons in an atom’s nucleus also represents the element’s...
   1 electric properties
   2 atomic number
   3 atomic weight
   4 chemical properties

1.4 Which of the following is not the property of matter?
   1 Metals are hard and strong
   2 Metals do not conduct heat and electricity very well
   3 All metals are solid at room temperature
   4 None of the above

1.5 Which of the following subatomic particles form(s) part of an atom?
   1 Ions
   2 Neutrons
   3 Proton
   4 None of the above

1.6 With reference to the Periodic Table of Elements, what number of electrons does mercury element have?
   1 40
   2 19
   3 26
   4 None of the above

1.7 Which of the following element is a non-metal?
   1 Zinc
   2 Phosphorus
   3 Titanium
   4 Neon
1.8 Which of the following gas is used in hospitals as a general anaesthetic?

1. carbon monoxide (CO)
2. sulphur dioxide (SO₂)
3. carbon dioxide (CO₂)
4. nitrous oxide (N₂O)

1.9 A physical entity of an element that can exist independently and still have the properties of that element.

1. matter
2. atom
3. electrons
4. molecules

1.10 Look at the Periodic Table of Elements. The mass number of carbon is:

1. 10.02
2. 12.01
3. 10.81
4. 9.012

1.11 K⁺ and Na⁺ are important ions in blood. They are:

1. isotopes
2. cations
3. anions
4. molecules

1.12 Which of the following Lewis structure is correct for chlorine?

```
1. x
  x
  x
  x
2. x
  x
  xx
3. x
  xx
  xx
4. x
  xx
  x
  x
```

1.13 Which one of the following statement would describe correctly what a valency of an element is?

1. The number of electrons in the outer energy level of the electron
2. The number that tells us how many electrons an atom must lose, gain, or share in order to acquire a noble gas electron configuration.
3. The number of protons needed to fill the outermost shell of an atom.
4. None of the above
1.14 The following statement does not represent the chemical changes.

1. Food is metabolized to release energy.
2. A red substance is decomposed by heat to mercury and oxygen.
3. Sodium dropped in water forms sodium hydroxide and hydrogen gas.
4. Salt dissolves in water.

1.15 The following is not the physical property of oxygen:

1. Oxygen is slightly lighter than air
2. It is colourless
3. Eighty percent of our oceans and lakes consist of oxygen
4. It is slightly soluble in water

1.16 The pH scale runs from:

1. pH1 to pH16
2. pH1 to pH14
3. pH1 to pH18
4. pH1 to pH112

1.17 When oxygen is combine with a non-metal, ____________ is formed.

1. basic oxides
2. neutral oxides
3. nitrous oxides
4. acid oxides

1.18 When a coloured sugar cube dissolves in a beaker of water, the sugar and dye molecules move from where they are highly concentrated to where they are absent or in a lower concentration. Eventually the molecules are evenly distributed and their concentrations are the same everywhere. Which one of the following phenomena is present in this scenario?

1. Osmosis
2. Diffusion
3. Filtration
4. Passive transport

1.19 If 602 were to be expressed in scientific notation, what would the correct answer be?

1. \(6.021 \times 10^4\)
2. \(6.021 \times 10^2\)
3. \(6.021 \times 10^{-2}\)
4. \(6.021 \times 10^{-3}\)

1.20 When converting 480cm to m, the answer would be:

1. 0.0048m
2. 0.048m
3. 4.8m
4. 0.48m

Total mark: 20

End of Assignment 01
Assignment 02

Due date: 16 March 2018

Unique assignment number: 657153

Semester period: 01

INSTRUCTIONS

1) Answer this assignment only if you are registered for Semester 1.

2) Read section eight of this tutorial letter before starting this assignment.

3) This assignment contains only multiple-choice questions (MCQ).

4) The purpose of this assignment is to familiarise you with Study units by means of techniques designed to improve your study skills. These techniques, namely skimming, scanning and study-reading, are discussed in your study guide under the Preface. Read it thoroughly before starting this assignment. This assignment thus focuses on the Study Guide only.
Question 1: Multiple-choice questions 

1.1 Calculate the volume of a block, with the length of 14cm, a breadth of 55mm and a height of 0.007m.

   1  53cm³
   2  53.9cm³  
   3  51.7cm³
   4  55cm³

1.2 A volume is:

   1  the amount of space that a particular object occupies
   2  the magnitude of the two-dimensional space enclosed within or occupied by an object.
   3  Volume = length x breadth
   4  the SI unit of volume is the cm²

1.3 Choose the correct answer The SI unit of weight is grams

   1  The density of water is 1.2g/cm³
   2  The density of mercury is 13.6g/cm³
   3  The density of a block of ice is 0.06g/cm³
   4  The density of petrol is 0.81g/cm³

1.4 You decide to place a can of Fanta orange, soft drink in the freezer. You accidentally left it in the freezer overnight. The following morning you find that the can has burst open. Which of the following options can this finding be attributed?

   1  Expansion of water
   2  Expansion of gases
   3  Expansion of solid
   4  Expansion of milk

1.5 The rise of water or a liquid in very small spaces is known as:

   1  adsorption
   2  capillarity
   3  adhesion
   4  none of the above

1.6 Which one of the following options lists only organic compounds?

   1  Water, oxygen, carbon dioxide, electrolytes
   2  Carbohydrates, protein, fats
   3  Water, electrolytes, salts, protein
   4  Salts, vitamins, water, minerals

1.7 The human body is made up of billions of very small units, called cells. The functions of cells includes:

   1  respiration, secretion, division
   2  excretion, diffusion, conductivity
   3  irritability, filtration, osmosis
   4  absorption, adsorption, convection
1.8 The connective tissue can be divided into four main groups, which are:

(i) Elastic fibres
(ii) Cartilage
(iii) bone
(iv) blood

1 (i) and (iv)
2 (ii) and (iv)
3 (ii), (iii) and (iv)
4 (ii) and (iii)

1.9 Blood vessels that carry blood to the heart are called:
1 veins
2 venules
3 arteries
4 capilarities

1.10 Examine the figure below. Which one of the following options, represents the correct answer for A, B and C?

1 A: Axon, B: synapse; C: Swann cell nucleus
2 A: impulse; B: cell body; C: myelin
3 A: myelin; B: dendrites; C: neurilemma
4 A: Axon; B: dendrite; C: neurilemma

1.11 What is the most abundant compound found in the human body?

1 Proteins
2 Salts
3 Fats
4 Water
1.12 Which of the following is true about bones?
1. they play an important role in blood formation
2. they play a role in blood transportation
3. they contribute to the conduction of impulse
4. have the ability to produce heat

1.13 Increased antidiuretic hormone (ADH) results
1. more water being excreted
2. more urine being secreted
3. more urine formation
4. more water being retained

1.14 Different classifications of bones exist in the human body. Which one of the following can be classified as a long bone?
1. Breast bone
2. Spine
3. Femur
4. Hyoid bone

1.15 Villi are present in large numbers in the__________.
1. stomach
2. jejunum
3. duodenum
4. ileum

1.16 Which one of the following options is not part of carbohydrate digestive enzyme?
1. Amylase
2. Peptidase
3. Lactase
4. Ptyalin

1.17 The kidneys are vital organs, which play an essential part in maintaining homeostasis by performing the following functions:
1. Regulation of osmotic pressure of body fluids by regulating the amount of protein and salt that the body excretes
2. Regulation of salt concentration by regulating the concentration of the various salts in the body
3. Excretion of protein metabolism by-products, such as carbon dioxide, salt, and water
4. Regulation of the acid-base balance of the body (pH) by regulating the excretion or retention of gases

1.18 The axial skeleton includes the following:
1. Ribs, endosteme, diaphysis
2. Femur, metacarpals, neck
3. Patella, fibula, vertebra
4. Skull, hyoid bone, sternum
1.19 Capillaries are______.
1 vessels that carries blood to the heart.
2 microscopic vessels that carry blood from small arteries to small veins.
3 returns blood to the heart.
4 functions as an exchange vessels for nutrients to the heart

1.20 Which of the following is an enzyme that is released by the pancreas for fat digestion?

1 Pancreatic amylase
2 Peptidase
3 Insulin
4 Pancreatic lipase

Total mark: 20

End of Assignment 02
Assignment 03

Due date: 03 April 2018

Unique assignment number: 752714

Semester period: 01

INSTRUCTIONS

1) Answer this assignment only if you are registered for Semester 1.

2) Read section eight of this tutorial letter before starting this assignment.

3) Carefully study ALL the Study Units in your Study Guide to complete Assignment 03.

4) Remember to refer to the prescribed textbook as referred to in the Study Guide.

5) Answer all questions as clearly as possible.

6) Except for definitions, formulate answers in your own words.

7) Now answer the questions that follow.
Question 1

1.1 You need to explain to someone what a solid is. Describe in your own words what characteristics a solid has in terms of its shape, volume, compressibility, motion of particles and arrangement of particles.

1.2 Classify the following substances as an element, a compound, a homogenous mixture or heterogeneous mixture:

1.2.1 Ne
1.2.2 K
1.2.3 Pb
1.2.4 Mn
1.2.5 Se

1.3 Have a look at the element sodium on the periodic table and answer the questions that follow:

1.3.1 What is the valency of Sodium?

1.3.2 How many valence electrons does Sodium have?

1.3.3 Differentiate between the terms mentioned in 1.3.1 and 1.3.2.

1.3.4 Draw the Lewis structures for sodium.

1.4 What is the difference between oxidation and reduction?

1.5 Explain why soaped white sheets bleached when they are spread out on grass on a sunny day

1.6 Discuss the uses of salts in humans, laundering and cookery.

1.7 Explain the difference between adhesion and cohesion forces

1.8 State the law of conservation of energy.

1.9 Consider the factors of conduction, convection and radiation and explain why a thermos flask is an efficient way of keeping coffee warm.

1.10 Take some raisins and put them in a bowl of water for approximately one hour. Drain the water from the raisins.

1.10.1 What do you observe in connection with the raisins?

1.10.2 Explain the phenomenon you have observed in activity 1.10.1.

1.11 Study the factors influencing the rate of evaporation. List factors, which will have an influence on the drying of blankets, give reason for your answers.
Question 2

2.1 Express the following numbers in scientific notation:

2.1.1 0.624
2.1.2 32 853
2.1.3 0.00054
2.1.4 5409

2.2 You want to know how many litres of water a specific container can take. The measurements of the container are as follows: breadth = 30cm, length = 55cm and height = 75cm. Calculate the volume of the container to determine how many litres of water the container can take.

2.3 A box of cereal weighs 450 grams. Show your work.

2.3.1 How many kilograms does it weigh?
2.3.2 How many milligrams does it weigh?

2.4 When considering osmosis, what will happen to a red blood cell when it is placed for a period of time in distilled water? Explain why this happens.

2.5 Explain all of the types of heat transfer, which occur when heating soup, in a stainless steel pan with plastic handles, on the stove.

2.6 List four sources of heat and in each case give an example of how these sources generate heat.

Question 3

3.1 What are the four general functions of the cutaneous membrane?

3.2 Name the three organic compounds found in a cell and explain the role of each.

3.3 There are different ways of movement of particles through cell membrane. Differentiate between passive and active transport.

3.4 Match the type of body tissue provided in column A with the correct function provided in column B. Write down the correct letter next to the number provided in column A on your answer sheet, for example: 3.4.1 G. Kindly note that it is possible that you may use each of the letters (A to F) more than once.

<table>
<thead>
<tr>
<th>Column A: Gl secretions</th>
<th>Column B: Function/action</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.5.1 Nervous tissue</td>
<td>A. Provides support and protection</td>
</tr>
<tr>
<td>3.5.2 Smooth muscle tissue</td>
<td>B. Responsible for pumping blood through heart chambers</td>
</tr>
<tr>
<td>3.5.3 Epithelial tissue</td>
<td>C. It provides a protective barrier</td>
</tr>
<tr>
<td>3.5.4 Cartilage</td>
<td>D. Conducts impulses to the brain</td>
</tr>
<tr>
<td></td>
<td>E. Responsible for the movement that constrict blood vessels</td>
</tr>
</tbody>
</table>
3.5 Re-draw and complete the following table (in your answer book) regarding the seven body systems as discussed in the study guide: (21)

<table>
<thead>
<tr>
<th>System</th>
<th>Main Function</th>
<th>Main Organs/ Components (name one)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.6 Discuss the factors influencing normal urine excretion. (2)

**Question 4** [20]

The liver is essential for the functioning of the digestive system. The end stage liver disease is liver cirrhosis. Search information on liver cirrhosis and then explain in the form of a concise literature review with a maximum of 500 words what liver cirrhosis is, what will be the effect of liver cirrhosis on the normal functioning of the liver and what would you recommend in order to prevent liver cirrhosis. Techniques to search for reputable information resources are explained in Tutorial letter 301, section 6 and correct referencing techniques in section 7. Add one of your sources referred to, to the assignment.

You will be assessed as follows:

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>MARK ALLOCATED</th>
</tr>
</thead>
<tbody>
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<td>4</td>
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<td>Insight into the prevention of liver cirrhosis</td>
<td>4</td>
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</tr>
<tr>
<td>TECHNICALITIES</td>
<td>8</td>
</tr>
<tr>
<td>Spelling and grammar</td>
<td>2</td>
</tr>
<tr>
<td>Word count</td>
<td>2</td>
</tr>
<tr>
<td>Scientifically written</td>
<td>2</td>
</tr>
<tr>
<td>Article correctly referenced</td>
<td>2</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

Total mark: 120

End of Assignment 03
ADDENDUM B: Assignments for Semester 2

Assignment 01

Due date: 10 August 2018

Unique assignment number: 836105

Semester period: 02

INSTRUCTIONS

1) Answer this assignment only if you are registered for semester 2.

2) Read section 8 of this tutorial letter before starting this assignment.

3) This assignment contains only multiple-choice questions (MCQs).

4) The purpose of this assignment is to familiarise you with study units by means of techniques designed to improve your study skills. These techniques, namely skimming, scanning and study-reading, are discussed in your study guide in the Preface. Read it thoroughly before starting this assignment. This assignment thus focuses on the study guide only.
Question 1: Multiple-choice questions

1.1 The physical state in which the particles have an extreme disorder, have almost complete freedom to move and take the shape and volume of the container, is what state?

1. Liquid
2. Gas
3. Solid
4. None of the above

1.2 Matter can change in its physical state of being a solid, liquid or gas. When water changes from steam (gas) to water (liquid), the process is called:

1. Condensation
2. Evaporation
3. Sublimation
4. Freezing

1.3 Which one of the following options is an example of the main principles of the kinetic theory of matter?

1. particles of matter is fixed and does not move
2. light weighted particles of matter move slower than heavy particles
3. matter is made up of small, invisible particles that seldom move around
4. None of the above

1.4 The formula of a compound indicates the following:

1. The name of the compounds.
2. The elements which make up the compound.
3. The ratio in which the different elements combined to form a molecule of the compound.
4. All of the above.

1.5 Which of the following elements are non-metals?

1. Chlorine
2. Aluminium
3. Polonium
4. Calcium

1.6 Which of the following elements are noble gases?

1. Neon
2. Argon
3. Helium
4. All of the above

1.7 Which of the following can be called an element?

1. H2O
2. Atom
3. Sodium chloride
4. None of the above
1.8 The valence electrons of oxygen’s number is:
   1  8
   2 16
   3  6
   4  2

1.9 Which of the following statements are correct about the formula $3\text{NH}_4$?
   1 There are 4 molecules of the specific compound as given in the formula above
   2 There are one nitrogen atom in the above given formula
   3 There are 12 hydrogen atoms in the above given formula
   4 None of the above

1.10 Which of the following pairs of elements is most likely to form an ionic compound?
   1 Magnesium and fluoride
   2 Nitrogen and sulphur
   3 Oxygen and chlorine
   4 Sodium and aluminium

1.11 Oxidizing enzymes causes browning of peeled or sliced fruits and vegetables. Which of the following can prevent this?
   1 By adding oxygen and leave it on an apple plate
   2 By adding any alkali such as baking soda
   3 By adding Vitamin D
   4 By the addition of acids such as lemon juice and vinegar

1.12 What type of energy is turned into heat when our bodies metabolise food?
   1 Kinetic energy
   2 Chemical energy
   3 Electric energy
   4 None of the above

1.13 When raisins are soaked in water, the fruit will become swollen. This is a practical example of:
   1 diffusion
   2 adsorption
   3 osmosis
   4 absorption

1.14 Which one of the following options explains how a thermo flask keeps heat in?
   1 The materials used in the thermos flask are poor conductors of heat, the thermos flask is tightly sealed preventing heat to spread and the shiny interior surface reflects heat back into the flask resulting in very little heat to be lost
   2 Conduction, convection and radiation
   3 Increased radiation, lack of convection and conduction
   4 Ability to keep heat in, to reflect the heat and the materials, which conduct heat
1.15 The error of parallax in measurement is incorrect reading due to:
   1 an eye problem
   2 the positioning of the eye in terms of the measuring instrument
   3 the instrument being placed incorrectly
   4 the measurement expressed in terms of the incorrect SI unit

1.16 A substance that changes its colour depending on whether it is in acidic or alkaline solution is:
   1 An indicator
   2 A salt
   3 A pH scale
   4 All of the above

1.17 The rise of water or liquid in very small space is known as:
   1 adhesion
   2 capillarity
   3 adsorption
   4 none of the above

1.18 When a coloured sugar cube dissolves in a beaker of water, the sugar and dye molecules move from where they are highly concentrated to where they are absent or in a lower concentration. Eventually the molecules are evenly distributed and their concentrations are the same everywhere. Which one of the following phenomena is present in this scenario?
   1 Osmosis
   2 Diffusion
   3 Filtration
   4 Passive transport

1.19 The rate of evaporation is influence by:
   1 Latent heat
   2 Movement of air
   3 The density of the liquid
   4 All of the above

1.20 On what principle does the thermostat that regulates the temperature in most stoves operate?
   1 Oven thermometer
   2 Potential energy
   3 Law of conservation of energy
   4 The expansion of metals

Total mark: 20

End of Assignment 01
Assignment 02

Due date: 24 August 2018

Unique assignment number: 822564

Semester period: 02

INSTRUCTIONS

1) Answer this assignment only if you are registered for Semester 2.

2) Read section eight of this tutorial letter before starting this assignment.

3) This assignment contains only multiple-choice questions (MCQ).

4) The purpose of this assignment is to familiarise you with Study units by means of techniques designed to improve your study skills. These techniques, namely skimming, scanning and study-reading, are discussed in your study guide under the Preface. Read it thoroughly before starting this assignment. This assignment thus focuses on the Study Guide only.
Question 1: Multiple-choice questions

1.1 What is the meaning of the prefix ‘mega’ in terms of an exponential number?
   1  $10^3$
   2  $10^{-3}$
   3  $10^6$
   4  $10^9$

1.2 You calculate the area of a square with side lengths of 85.3 cm. Which of the following is the correct answer?
   1  7276.09 cm
   2  7276.09 cm$^2$
   3  1180.6 cm$^2$
   4  1176.2 cm

1.3 The SI unit of weight is grams
   1  True
   2  False

1.4 When you calculate the circumference of a tennis ball, with a radius of 3 cm, which of the following answers do you get?
   1  18.84 cm
   2  18.85 cm$^2$
   3  19 cm$^2$
   4  29.29 cm

1.5 Calculate the volume of a brick of margarine, with the length of 12 cm, a breadth of 500 mm and a height of 0.004 m to be 240 cm$^3$. How many millilitres of margarine is this?
   1  2.4 L
   2  0.24 ml
   3  240 ml
   4  2.4 ml

1.6 Which one of the following options lists are only inorganic compounds?
   1  Carbohydrates, protein, vitamins, lipids
   2  Water, oxygen, carbon dioxide, electrolytes
   3  Salts, vitamins, water, minerals, glucose
   4  Water, electrolytes, salts, protein

1.7 Different classifications of bones exist in the human body. Which one of the following can be classified as a long bone?
   1  Breast bone
   2  Spine
   3  Femur
   4  Hyoid bone
1.8 The kidneys are vital organs, which play an essential part in maintaining homeostatic by performing the following functions:

1. Regulation of osmotic pressure of body fluids by regulating the amount of protein and salt that the body excretes
2. Regulation of salt concentration by regulating the concentration of the various salts in the body
3. Excretion of protein metabolism by-products, such as carbon dioxide, salt, and water
4. Regulation of the acid-base balance of the body (pH) by regulating the excretion or retention of gases

1.9 The axial skeleton includes the following:

1. Ribs, endosteum, diaphysis
2. Femur, metacarpals, neck
3. Patella, fibula, vertebra
4. Skull, hyoid bone, sternum

1.10 Capillaries are ____________.

1. a vessel that carries blood to the heart
2. microscopic vessels that carry blood from small arteries to small veins energy
3. returns blood to the heart
4. functions as an exchange vessel for nutrients to the heart

1.11 Urine formation occurs in the__________.

1. ureter
2. nephrons
3. glomerulus
4. the loop of Henlé

1.12 Increased antidiuretic hormone (ADH) results in ____________.

1. more water be excreted
2. more urea being secreted
3. increased urine formation
4. more water being retained

1.13 Choose the correct order of the transmission of an impulse resulting from a knee reflex:

1. motor neuron – synapse – sensory neuron – receptor - effector
2. receptor – motor neuron – synapse – sensory neuron - effector
3. receptor – sensory neuron – synapse – motor neuron - effector
4. effector– sensory neuron – synapse – motor neuron - receptor

1.14 The four basic tissue types found in the body are:

1. epithelial, connective, muscle, nervous
2. skeletal, smooth, connective and nervous
3. lymphocytes, macrophages, adipocytes, fibroblasts
4. mucous, serous, synovial and cutaneous
1.15 The supporting connective tissue group consists of:

(i) Connective tissue
(ii) Cartilage
(iii) Bone
(iv) Blood

1 (i) and (iv)
2 (ii) and (iv)
3 (i), (ii), (iii) and (iv)
4 (ii) and (iii)

1.16 The cytoplasm is the term for

1 all cell organelles
2 the fluid portion of the cell
3 the fluid portion of the cell plus all of the cell organelles
4 the communication centre of the cell

1.17 The skeletal muscle has the following functions:

1 contract and relax to produce movement of the body
2 produce heat by the process of catabolism
3 maintains posture
4 all of the above

1.18 In humans, gas exchange occurs in the ________________.

1 trachea
2 alveolus
3 bronchi
4 diaphragm

1.19 Which of the following is an enzyme that is released by the pancreas for fat digestion?

1 Pancreatic amylase
2 Peptidase
3 Insulin
4 Pancreatic lipase

1.20 Villi are present in large numbers in the ________________.

1 stomach
2 jejunum
3 duodenum
4 The ileum

Total mark: 20

End of Assignment 02
Assignment 03

Due date: 07 September 2018

Unique assignment number: 853451

Semester period: 02

INSTRUCTIONS

1) Answer this assignment only if you are registered for Semester 2.

2) Read section eight of this tutorial letter before starting this assignment.

3) Carefully study ALL the Study Units in your Study Guide to complete Assignment 03.

4) Remember to refer to the prescribed textbook as referred to the study guide.

5) Answer all questions as clearly as possible.

6) Except for definitions, formulate answers in your own words.

7) Now answer the questions that follow.
Question 1  

1.1 Classify the following substances as an element, a compound, a homogenous mixture or heterogeneous mixture:  
(5)

1.1.1 Stew 
1.1.2 Aluminium 
1.1.3 Water 
1.1.4 Milk 
1.1.5 Salt 

1.2 List six important points regarding the structure of an atom.  
(6)

1.3 Draw the following table in your answer sheet and fill in the blank spaces (one column per element)  
(14)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Ar</th>
<th>Cl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of protons</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Number of neutrons</td>
<td></td>
<td>14.09</td>
</tr>
<tr>
<td>Number of electrons in the neutral atom</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Name of the element</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1.4 What is the number of valence electrons for Sulphur?  
(1)

1.5 Explain why soaped white sheets bleached when they are spread out on grass on a sunny day.  
(2)

1.6 Study the chemical formula below and then answer the questions that follow:  
$3\text{Na}_2\text{CO}_3$ (Sodium carbonate)  

1.6.1 How many molecules of sodium carbonate are there in the above formula?  
(1)

1.6.2 What is the total number of atoms of each of the elements in the above formula of sodium carbonate?  
(3)

1.7 Discuss the uses of salts in humans, laundering and cookery.  
(6)

1.8 Your aunt is very pleased with the copper cooking utensils she got as a birthday present from a friend. Your fellow student warns your aunt to rather use the utensils as ornaments and not for cooking, especially when vinegar is involved with cooking. Explain why your friend gives this advice to your aunt?  
(2)
Question 2 [20]

2.1 Express the following numbers in scientific notation:

- 2.1.1 0.215 (1)
- 2.1.2 23 358 (1)
- 2.1.3 0.0045 (1)
- 2.1.4 211 (1)
- 2.1.5 18.72 (1)

2.2 You want to know how many litres of water a specific container can take. The measurements of the container are as follows: breadth = 30cm, length = 55cm and height = 75cm. Calculate the volume of the container to determine how many litres of water the container can take. (4)

2.3 Explain the term capillarity and give three examples of the application of capillary force. (4)

2.4 Two equal amounts of solution, A and B, are separated by a selectively permeable barrier. Over a period of time, the level on side A increases. Which solution initially had the higher concentration of solute? Describe the process that occurs while the level of side A is increasing. (4)

2.5 Consider the factors conduction, convection and radiation and motivate why a thermos flask is an efficient way of keeping coffee warm. (3)

Question 3 [40]

3.1 What are the four general functions of the cell membrane? (4)

3.2 Draw the following table in your answer sheet and tabulate the differences and similarities between facilitated diffusion and active transport. (7)

3.3 Bone consists of active living tissue. The natural process of bone renewal consists of bone formation and bone resorption. Discuss what happens to bone when resorption happens faster than formation. Also discuss how this can be prevented. (You should consult the study guide, textbook and external resources to assist you in answering this question). (8)

3.4 Differentiate between the different types of muscle tissue and highlight the location where these different muscles tissue types can be found in the body and also give one function of each. Give your answer in table format. (9)

3.5 The lining of the nasal cavity is normally moist, contains numerous cells and rests on a layer of loose connective tissue. Identify the type of membrane this is and provide the main functions of this membrane type. (4)
3.6 Write down the reactions that take place when the disaccharide enzymes on the surface of the small intestinal cells, hydrolyze the disaccharides (maltose, sucrose and lactose) to monosaccharides. (3)

3.7 Explain in your own words why the liver is important in carbohydrate metabolism. (5)

**Question 4**

The liver is essential for the functioning of the digestive system. The end stage liver disease is liver cirrhosis. Search information on liver cirrhosis and then explain in the form of a concise literature review with a maximum of 500 words what liver cirrhosis is, what will be the effect of liver cirrhosis on the normal functioning of the liver and what would you recommend in order to prevent liver cirrhosis. Techniques to search for reputable information resources are explained in Tutorial letter 301, section 6 and correct referencing techniques in section 7. Add one of your sources referred to, to the assignment.

You will be assessed as follows:

<table>
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<tr>
<th>ITEMS</th>
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Total mark: 120

End of Assignment 03