Tutorial letter 101/3/2018

Environmental Geology
GEL1503

Semesters 1 & 2

Department of Environmental Sciences

IMPORTANT INFORMATION:
This tutorial letter contains important information about your module.
## CONTENTS

<table>
<thead>
<tr>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 INTRODUCTION ................................................................................................................. 4</td>
</tr>
<tr>
<td>2 PURPOSE OF AND OUTCOMES FOR THE MODULE ................................................................. 4</td>
</tr>
<tr>
<td>2.1 Purpose .......................................................................................................................... 4</td>
</tr>
<tr>
<td>2.2 Outcomes ....................................................................................................................... 4</td>
</tr>
<tr>
<td>3 LECTURER(S) AND CONTACT DETAILS .............................................................................. 6</td>
</tr>
<tr>
<td>3.1 Lecturer(s) ..................................................................................................................... 6</td>
</tr>
<tr>
<td>3.2 Department .................................................................................................................... 6</td>
</tr>
<tr>
<td>3.3 University ...................................................................................................................... 6</td>
</tr>
<tr>
<td>4 MODULE-RELATED RESOURCES ........................................................................................ 7</td>
</tr>
<tr>
<td>4.1 Prescribed books ........................................................................................................... 7</td>
</tr>
<tr>
<td>4.2 Recommended books ...................................................................................................... 7</td>
</tr>
<tr>
<td>4.3 Electronic Reserves (e-Reserves) .................................................................................. 7</td>
</tr>
<tr>
<td>4.4 Library services and resources information ................................................................... 8</td>
</tr>
<tr>
<td>5 STUDENT SUPPORT SERVICES FOR THE MODULE ......................................................... 8</td>
</tr>
<tr>
<td>6 MODULE-SPECIFIC STUDY PLAN ................................................................................... 8</td>
</tr>
<tr>
<td>7 MODULE PRACTICAL WORK AND WORK-INTEGRATED LEARNING ................................ 9</td>
</tr>
<tr>
<td>8 ASSESSMENT .................................................................................................................... 9</td>
</tr>
<tr>
<td>8.1 Assessment criteria ........................................................................................................ 9</td>
</tr>
<tr>
<td>8.2 Assessment plan ............................................................................................................. 9</td>
</tr>
<tr>
<td>8.3 General assignment numbers ....................................................................................... 9</td>
</tr>
<tr>
<td>8.3.1 Unique assignment numbers ................................................................................... 10</td>
</tr>
<tr>
<td>8.3.2 Due dates for assignments ....................................................................................... 10</td>
</tr>
<tr>
<td>8.4 Submission of assignments .......................................................................................... 10</td>
</tr>
<tr>
<td>9 ACADEMIC INTEGRITY AND AVOIDING PLAGIARISM .................................................. 11</td>
</tr>
<tr>
<td>9.1 What is academic integrity? .......................................................................................... 11</td>
</tr>
<tr>
<td>9.2 How does the university view plagiarism? .................................................................... 12</td>
</tr>
<tr>
<td>9.3 What if I commit plagiarism in this module? ............................................................... 12</td>
</tr>
<tr>
<td>9.4 Ethics Statement ........................................................................................................... 12</td>
</tr>
<tr>
<td>10 OTHER ASSESSMENT METHODS .................................................................................. 13</td>
</tr>
<tr>
<td>11 EXAMINATION ............................................................................................................... 13</td>
</tr>
<tr>
<td>12 CONCLUSION .................................................................................................................. 14</td>
</tr>
<tr>
<td>13 ADDENDUM A .................................................................................................................. 15</td>
</tr>
</tbody>
</table>
ADDENDUM B
1 INTRODUCTION

Dear Student

We welcome you to the Department of Environmental Sciences and in particular to the introductory module of Geology, namely Environmental Geology. In addition to forming a basis for subsequent studies in the earth sciences, this module also contains knowledge that may be applicable in everyday life. We trust you find the module interesting and its contents useful.

Being an introduction to Geology, this module contains many new concepts and terms. Regular study habits will be necessary to understand these concepts and master the terminology.

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 assignment(s) properly.

You will receive a number of tutorial letters during the semester. A tutorial letter is our way of communicating with you about teaching, learning and assessment.

Tutorial Letter 101 contains important information about the scheme of work, resources and assignments for this module. We urge you to read it carefully and to keep it at hand when working through the study material, preparing the assignment(s), preparing for the examination and addressing questions to your lecturers.

In Tutorial Letter 101, you will find the assignments and assessment criteria as well as instructions on the preparation and submission of the assignments. This tutorial letter also provides all the information you need with regard to the prescribed study material and other resources and how to obtain it. Please study this information carefully and make sure that you obtain the prescribed material as soon as possible.

We have also included certain general and administrative information about this module. Please study this section of the tutorial letter carefully.

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

We hope that you will enjoy this module and wish you success in your studies.

2 PURPOSE OF AND OUTCOMES FOR THE MODULE

2.1 Purpose

By completing this module, learners should acquire knowledge and competencies underpinning the comprehension of the Earth as a system consisting of interrelating subsystems such as climate- and plate tectonic systems. The interaction between the systems of the lithosphere, asthenosphere, hydrosphere, and atmosphere is of utmost importance for the biosphere – where humans and their activities have a major impact. In addition learners should acquire a basic knowledge of research methodologies, together with writing and reporting skills befitting the NQF level 5. Learners should also be able to respond on ethical issues regarding human activity and the impact it has on Earth as a system.

2.2 Outcomes

Upon completion of this unit standard learners should be able to demonstrate:
(a) a basic understanding of the subsystems of the Earth System, and its interactions, which control geological processes.

(b) their knowledge of how minerals and rocks partakes in the Rock Cycle within the interactions between the Plate Tectonic and Climate Systems.

(c) their comprehension of the internal processes of the Earth and the external expressions of these processes.

(d) a fundamental understanding of geological surface processes by means of water, wind, and ice/glaciers, as an expression of the interaction between the subsystems atmosphere, hydrosphere and lithosphere.

(e) an ethical perception in earth issues for human conduct in transposing environmental geology to each level of activity that influences the Earth.

(f) an ability to formulate answers to questions given in assignments through reading, understanding and integration of information, that underpins the ability to report on findings of elementary research in a scientific way using conventional formats and applying basic technologies, to peers and professionals.

The syllabus for this module is:

**STUDY UNIT 1: THE EARTH SYSTEM**

1.1 The Earth System
1.2 Plate Tectonics: The Unifying Theory
1.3 Earth Materials: Minerals and Rocks
1.4 What are Rocks?

**STUDY UNIT 2: INTERNAL EARTH PROCESSES**

2.1 Deformation: Modification of Rocks by Folding and Fracturing
2.2 Earthquakes
2.3 Exploring Earth's Interior

**STUDY UNIT 3: EXTERNAL EARTH PROCESSES**

3.1 Weathering, erosion and mass wasting
3.2 The Hydrologic Cycle and Groundwater
3.3 Streams: Transport to the Oceans
3.4 Winds and Deserts
3.5 Glaciers: The Work of Ice
3.6 Coastlines and ocean basins
3.7 Landscape development
3 LECTURER(S) AND CONTACT DETAILS

3.1 Lecturer(s)

The lecturer responsible for this module is as follows:

Dr Gerhard Nortjé
Office number: B1-26
Calabash Building
Florida Campus
Jordam@unisa.ac.za
011 471-2286 (International: +27 11 471 2286)

All queries that are not of a purely administrative nature but are about the content of this module should be directed to us. Please have your study material with you when you contact us.

E-mail and telephone numbers are included above but you might also want to write to us. Letters should be sent to:

The Module leader (GEL1503)
Department of Environmental Sciences
PO Box 392
UNISA
0003

3.2 Department

Department of Environmental Sciences

Tel: 011 471 2213 (International: +27 11 471 3118)

Fax: 011 471 2866 (International: +27 11 471 2866)

3.3 University

If you need to contact the University about matters not related to the content of this module, please consult the publication My studies @ Unisa that you received with your study material. This booklet contains information on how to contact the University (e.g. to whom you can write for different queries, important telephone and fax numbers, addresses and details of the times certain facilities are open).

Always have your student number at hand when you contact the University.

Please note that all administrative enquiries should be directed to the following E-mails:
4 MODULE-RELATED RESOURCES

4.1 Prescribed books

Your prescribed textbook for this module for this semester is:


Please consult the list of official booksellers and their addresses listed in the myStudies @ Unisa brochure. If you have any difficulties in obtaining books from these bookshops, please contact the Unisa Library.

4.2 Recommended books

The following are publications that you may consult in order to broaden your knowledge of Environmental geology. A limited number of copies are available in the Library.


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: http://www.unisa.ac.za/contents/studies/docs/myStudies-at-Unisa2017-brochure.pdf

For more detailed information, go to the Unisa website: http://www.unisa.ac.za/, 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 numerous library guides:

- find recommended reading in the print collection and e-reserves - http://libguides.unisa.ac.za/request/undergrad
- request 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/find us on social media/frequently asked questions - http://libguides.unisa.ac.za/ask

5 STUDENT SUPPORT SERVICES FOR THE MODULE

For information on the various student support systems and services available at Unisa (e.g. student counseling, tutorial classes, language support), please consult the publication My studies @ Unisa that you received with your study material.

5.1 Study groups

It is advisable to have contact with fellow students. One way to do this is to form study groups. You are encouraged to use your MyUnisa account to contact fellow students to setup study groups per area.

5.2 myUnisa

If you have access to a computer that is linked to the internet, you can quickly access resources and information at the University. The myUnisa learning management system is Unisa's online campus that will help you to communicate with your lecturers, with other students and with the administrative departments of Unisa – all through the computer and the internet.

To go to the myUnisa website, start at the main Unisa website, http://www.unisa.ac.za, and then click on the “Login to myUnisa” link on the right-hand side of the screen. This should take you to the myUnisa website. You can also go there directly by typing in http://my.unisa.ac.za.

Please consult the publication My studies @ Unisa which you received with your study material for more information on myUnisa.

5.3 Discussion classes

There will be no pre-organized discussion classes for this module but additional information and teaching material will be made available to you by means of myUnisa or the post.

6 MODULE-SPECIFIC STUDY PLAN

Please refer to the myStudies @ Unisa brochure for general time management and planning skills. Study the table (Study Framework for 2018) below to plan your semester. Take into...
account the number of weeks in a semester, number of study units to be covered, due dates for assignments, examinations, etc.

**STUDY FRAMEWORK FOR 2018**

<table>
<thead>
<tr>
<th>WEEKS</th>
<th>STUDY UNITS</th>
<th>IMPORTANT DATES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Study Unit 1</td>
<td>Read for background knowledge</td>
</tr>
<tr>
<td>2</td>
<td>Study Unit 2</td>
<td>Read for background knowledge</td>
</tr>
<tr>
<td>3</td>
<td>Study Unit 3</td>
<td>Read for background knowledge</td>
</tr>
<tr>
<td>4</td>
<td>Study Units 1.1 &amp; 1.2</td>
<td>Read comprehensively</td>
</tr>
<tr>
<td>5</td>
<td>13 - 17 March/14 - 18 August</td>
<td>Complete Assignment 01 and submit</td>
</tr>
<tr>
<td>6</td>
<td>Study Unit 1.3 &amp; 1.4 &amp; 1.5</td>
<td>Read comprehensively</td>
</tr>
<tr>
<td>7</td>
<td>Study Unit 2.1 &amp; 2.2 &amp; 2.3</td>
<td>Read comprehensively</td>
</tr>
<tr>
<td>8</td>
<td>Study Unit 3.1 &amp; 3.2</td>
<td>Read comprehensively</td>
</tr>
<tr>
<td>9</td>
<td>Study Unit 3.3 &amp; 3.4</td>
<td>Read comprehensively</td>
</tr>
<tr>
<td>10</td>
<td>Study Unit 3.5 &amp; 3.6</td>
<td>Read comprehensively</td>
</tr>
<tr>
<td>11</td>
<td>Study Unit 3.7 &amp; 3.8</td>
<td>Read comprehensively</td>
</tr>
<tr>
<td>12</td>
<td>10-14 April/11-15 September</td>
<td>Complete Assignment 02 and submit</td>
</tr>
<tr>
<td>13 &amp; 14</td>
<td>Exam block period</td>
<td></td>
</tr>
</tbody>
</table>

7 MODULE PRACTICAL WORK AND WORK-INTEGRATED LEARNING

There is no practical work or work integrated learning for this module. (Practical work is incorporated in to the GEL1502 module)

8 ASSESSMENT

8.1 Assessment criteria

8.2 Assessment plan

Assignments are seen as part of the learning material for this module. As you do the assignment, study the reading texts, consult other resources, discuss the work with fellow students or tutors or do research, you are actively engaged in learning. Looking at the assessment criteria given for each assignment will help you to understand what is required of you more clearly.

In some cases, additional assessment might be available on the myUnisa site for your module. For students attending tutorial sessions, tutors may also set additional tasks and give feedback in class.

For written assignments, markers will comment constructively on your work. However, commentaries on compulsory assignments will be sent to all students registered for this module in a follow-up tutorial letter, and not only to those students who submitted the assignments. The tutorial letter number will be 201, 202, etc.

As soon as you have received the commentaries, please check your answers. The assignments and the commentaries on these assignments constitute an important part of your learning and should help you to be better prepared for the next assignment and the examination.

8.3 General assignment numbers

Assignments are numbered in numerical sequence.
8.3.1 Unique assignment numbers

The unique numbers for Semester 1, assignment 1 is 740642 and for assignment 2 it is 696219.
The unique numbers for Semester 2, assignment 1 is 854265 and for assignment 2 it is 745863.

8.3.2 Due dates for assignments

The closing dates for the submission of the assignments are:

<table>
<thead>
<tr>
<th>SEMESTER 1</th>
<th>SEMESTER 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignment 1: 23 March 2018</td>
<td>Assignment 1: 24 August 2018</td>
</tr>
<tr>
<td>Assignment 2: 20 April 2018</td>
<td>Assignment 2: 21 September 2018</td>
</tr>
</tbody>
</table>

8.4 Submission of assignments

You may submit written assignments either by post or electronically via myUnisa. Assignments may not be submitted by fax or e-mail. For detailed information and requirements as far as assignments are concerned, see the brochure My studies @ Unisa that you received with your study material. It is most desirable and recommended that you submit your assignments via myUNISA and in pdf format. If you submit your assignment you need to submit your assignments online in PDF format via myUnisa. Software to convert Word documents to PDF is available on myUnisa. You can also download a free PDF convertor from http://www.primopdf.com/index.aspx.

To submit your assignment online go to the module site on myUnisa and click on the Assignments tool and follow the instructions below:

- Type in your student number and then click on the assignment number you wish to submit.
- Follow the instructions on the screen to make sure that your assignment is uploaded on myUnisa.
- If you experience problems with myUnisa, contact bugmaster@unisa.ac.za. Describe the problem and/or the error message in detail.
9 ACADEMIC INTEGRITY AND AVOIDING PLAGIARISM

9.1 What is academic integrity?

Academic integrity is obeying the rules of the university/the module. It is about how you conduct yourself when you interact with other students and staff. It is the acknowledgment of and respect for the academic principles and behaviours that support the University’s mission. It is part of what it means to be a good student. A good student is one who does their own assignments and writes their own examinations. A good student always acknowledges the sources they have used and the people who have helped them. A good student conducts research and writes assignments with integrity, honesty and ethically. A good student is a responsible student who submits assignments on time and speaks/writes truthfully. A good student learns from their mistakes and is a good academic citizen. A good student does not commit plagiarism.

You commit plagiarism if you:

- “Cut and paste or copy and paste” sentences, paragraphs, diagrams, maps, tables and other information directly from an internet (websites), digital or printed sources into your assignment without acknowledgement and without adaptation (where necessary). No one can wholesale cut/copy and paste from a source EVEN WITH ACKNOWLEDGMENT.
- Use paragraphs or sections from articles, books and web documents without adapting them into your own words and style, unless it is a direct quote, which is acknowledged as such.
- Use another person’s direct words without quotation marks, their surname, date of publication and page numbers.
- Copy the work of other students and submit it as if it is your own.
- Present the ideas, words or results of another person as yours, without giving correct acknowledgement to the original author.
- Use the ideas or words of another person without giving necessary credit to that person or source.
- Present ideas/words in a manner that there is no substantial difference between what the author/s said and what you are saying - this is regardless of acknowledgment of the source.
Self-plagiarize – when you use your own work, previously submitted for this or any other module, without acknowledgement.

9.2 How does the university view plagiarism?

The university views plagiarism as a serious offence. You can either lose marks, have the assignment awarded a ZERO and/or face a disciplinary hearing. If you face a disciplinary hearing you may be suspended from the university for a period (e.g. two years) or even have your degree rescinded.

9.3 What if I commit plagiarism in this module?

The lecturer trusts that all the students registered for this module will not commit plagiarism, but if you do you can either have marks deducted, be awarded zero, or your name will be sent to university management with details of the offence and a request that you be called to a disciplinary hearing. We keep a record of all students who commit plagiarism. If you are a serial plagiariser – you commit plagiarism many times or across different modules - then you will be called to a disciplinary hearing regardless of how small the plagiarism offence is.

You will receive the correct answers automatically for multiple-choice questions (if applicable). For written assignments, markers will comment constructively on your work. However, commentaries on compulsory assignments may be sent to all students registered for this module in a follow-up tutorial letter, and not only to those students who submitted the assignments. The tutorial letter number will be 201, 202, etc.

As soon as you have received the commentaries, please check your answers. The assignments and the commentaries on these assignments constitute an important part of your learning and should help you to be better prepared for the next assignment and the examination. Additional feedback or information on assignments might be placed on myUnisa.

9.4 Ethics Statement

All students who register for this module should take note that your lecturer may or may not require information from you for research purposes. The information required may be from the assignments you complete or additional activities your lecturer may have asked you to take part in or comment on or the marks you achieved for your assignment or anything related to the teaching of the module you registered for. In all these instances, the information provided by you will not identify you in any way. Your identify will remain anonymous and the information you provide will remain confidential. The lecturer will not use your information in any way that is unethical or does not abide by the Unisa Policy on Research Ethics. The lecturer will also apply
to the College Ethics Research Committee for ethics clearance to do research on specific data from the module after which approval will be obtained from the Research Permission Sub-Committee of Unisa to use Unisa student data. Through this research, the lecturer will be able to improve and develop this module for future students. If you cannot consent to your lecturer using the information indicated above, please let your lecturer know via email.

10 OTHER ASSESSMENT METHODS

There are no other assessments for this module.

11 EXAMINATION

11.1 Examination admission
A student must obtain a year mark of at least 40% to qualify for admission to the examination. The contribution of each assignment towards the year mark is indicated in the table below.

11.2 How will this work in practice?

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due date Semester 1</th>
<th>Due date Semester 2</th>
<th>Contribution to year mark</th>
<th>Contribution to final mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEL1503 Assignment 01</td>
<td>23 March 2018</td>
<td>24 August 2018</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>GEL1503 Assignment 02</td>
<td>20 April 2018</td>
<td>21 September 2018</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>EXAMINATION</td>
<td>MAY/JUNE 2018</td>
<td>OCT/NOV 2018</td>
<td></td>
<td>70</td>
</tr>
</tbody>
</table>

11.3 Examination period

This module is a semester module in 2018. This means that you will write the examination in May/June 2018 for the first semester and in Oct/Nov 2018 for the second semester. During the semester, the Examination Section will provide you with information regarding the examination in general, examination venues, examination dates and examination times.

11.4 Examination paper

The examination will comprise a two-hour paper. Students must obtain a year mark of at least 40% to qualify for admission to write the examination. Students also have to gain a subminimum of 40% in the examination paper to pass.

11.5 Previous examination papers
Previous examination papers are available to students on the myunisa portal. You may expect that the examination questions will be similar to the questions asked in the activities in your study guide and in the assignments.

11.6 Tutorial letter with information on the examination

To help you in your preparation for the examination, you will receive a tutorial letter that will explain the format of the examination paper, give you examples of questions that you may expect and set out clearly what material you have to study for examination purposes.

12 CONCLUSION

Finally, we would like to encourage you to keep to the following rules:

- Do NOT fall behind in your planning.
- Work regularly and consistently.
- Make sure that you understand the work as you go along.
- Study when you must. Do NOT postpone.
- Do NOT give up on difficult work. Rather seek help as soon as possible.

We hope that this information will make your studies easier, and that you will do well.
13 ADDENDUM A

FIRST SEMESTER COMPULSORY ASSIGNMENTS

The Department of Environmental Sciences would like to mark more of your assignments electronically. We would thus like to encourage you to submit your assignments electronically (in PDF format) via myUnisa. Software to convert a Word document to PDF is available on myUnisa. You can download a PDF convertor free of charge from http://www.primopdf.com/index.aspx.

The advantages for you submitting your assignment in PDF format are numerous. Your assignment will reach us sooner and therefore you will receive feedback much earlier. This mode is also largely more environmentally friendly.

See below for Assignment Questions:
UNIVERSITY OF SOUTH AFRICA

DEPARTMENT OF ENVIRONMENTAL SCIENCES

ENVIRONMENTAL GEOLOGY

GEL1503

ASSIGNMENT 01 (COMPULSORY)
Due date 1st semester: 23 March 2018 (Unique number: 740642)

INSTRUCTIONS

1. Type your answer on A4 paper.

2. Remember to mention the sources you refer to in the text. Also remember to include a list of references.

3. Remember to write your student number in the top left-hand corner of each page.

4. Staple the assignment cover page to your completed assignment.

5. Place your completed assignment in the post-paid envelope supplied by Unisa. Seal the envelope.

6. Mail the assignment at least one week before the due date to ensure that it reaches us in good time.

7. You may submit written assignments electronically via myUnisa
QUESTION 1

Answer all the following questions by writing the number as well as the correct option on your answer paper (eg 25 D, 26 C, 27 A):

1.1 The epicentre of an earthquake is the
A place where the earthquake originates.
B place on the earth's surface directly above the focus of the earthquake.
C place where sudden movement has occurred along a fault line.
D place where magma has burst through the earth's surface.

1.2 Rivers of ice are
A piedmont glaciers.
B valley glaciers.
C continental glaciers.
D ice sheets.

1.3 Which rocks are directly related to volcanism?
A igneous rocks
B sedimentary rocks
C metamorphic rocks
D clastic rocks

1.4 The single most distinctive feature of sedimentary rocks is
A vertical joints.
B a crystalline structure.
C recrystallization.
D stratification.

1.5 The direction along which the movement has taken place at the time when faulting occurs is called the
A fault line.
B strike.
C slip.
D dip-slip.

1.6 The total process of land surface reduction is termed
A erosion.
B denudation.
C degradation.
D aggradation.

1.7 The super-continent Pangaea started disintegrating
A 3 000 million years ago.
B 50 million years ago.
C 200 million years ago.
D 350 000 years ago.

1.8 95% of the volume of the earth's crust is composed of a group of minerals known as

A the felsic group.
B the matic group.
C silicates.
D iron oxide minerals.

1.9 The final structure, texture and composition of metamorphic rocks are controlled by

(i) the character of the parent material.
(ii) fusion.
(iii) the conditions of metamorphism.
(iv) recrystallization.

Select the option containing the correct combination of answers:

A (i), (iv)
B (ii), (iv)
C (iii), (iv)
D (i), (iii)

1.10 Igneous rocks are classified according to

(i) grain texture.
(ii) mineral composition.
(iii) origin.
(iv) chemical structure.

Select the option containing the correct combination of answers:

A (i), (iii)
B (i), (ii)
C (ii), (iii)
D (iii), (iv)

1.11 Tsunamis are

A shock waves.
B landslides.
C seismic sea waves.
D avalanches.

1.12 The types of volcanic cone are determined by the

(i) topography of the area.
(ii) nature of the eruption.
(iii) type of material that has been extruded.
(iv) rock layers.

Select the option containing the correct combination of answers:

A (i), (ii)
B (ii), (iii)
C (iii), (iv)
D (i), (iv)
1.13 Many old stream valleys contain
A. Rapids.
B. Turbulent water flow.
C. Large gradients.
D. Meanders.

1.14 The steepness of slope of a stream channel in the direction of flow is its
A. drainage basin
B. discharge
C. load
D. gradient
E. capacity

1.15 Processes of chemical weathering that also involve biological weathering are
A. solution.
B. carbonation and oxidation.
C. reduction and chelation.
D. hydration and hydrolysis.

1.16 Deposition of stream load occurs
A. when the speed of flow of the river is reduced.
B. when the speed of flow of the river is increased.
C. at the point of rejuvenation of a river.
D. all of the above.

1.17 The motion of a glacier is caused by
(i) melting ice at the bottom which forms lubrication.
(ii) gravity.
(iii) differential pressure within the ice mass.
(iv) evaporation.
Select the option containing the correct combination of answers:
A. (i), (ii)
B. (i), (iii)
C. (ii), (iv)
D. (ii), (iii)

1.18 Wind erosion landforms such as pedestal rocks are caused by a process of
A. abrasion.
B. deflation.
C. attrition.
D. all of the above simultaneously.
1.19 Drowned glacial valleys are known as

A Dalmatian coasts.
B ria coasts.
D fiord coasts.
D none of the above.

1.20 Processes involving the transfer of molten material from one place in the earth’s crust to another, resulting in landforms of great elevation, are called

A exogenous forces.
B diastrophism.
C volcanism.
D isostasy.

[20]

QUESTION 2

Match the term with its appropriate description by combining the correct number with the letter that is most appropriate. E.g.: 9 = J

| 1. Lithosphere | A the thin, rocky outer skin, topped by continents |
| 2. Asthenosphere | B the thin, rocky outer skin, topped by oceans |
| 3. Mesosphere | C a solid, rocky shell composing about 82% of Earth's volume |
| 4. Inner core | D solid iron-nickel alloy at the centre of the Earth |
| 5. Atmosphere | E the strong lower mantle, below the asthenosphere |
| 6. Mantle | F a liquid layer at the top of the core, that generates Earth’s magnetic field |
| 7. Anthropological sphere | G weak, soft layer composed of the mantle beneath the lithosphere |
| 8. Oceanic crust | H strong, rigid layer composed of the crust and the upper mantle |
| 9. Outer core | I Area of human activity |
| 10. Continental crust | J layer of gas or gases surrounding a celestial body |

[10]
QUESTION 3

Define the following:

i. Geology
ii. Magnetic anomaly
iii. Lithification
iv. Deformation
v. Thrust Fault
vi. Aftershock
vii. Isostasy
viii. Talus
ix. Precipitation
x. Abyssal plain

[20]

TOTAL: [50]

END OF ASSIGNMENT 01
INSTRUCTIONS

1. Type your answer on A4 paper.

2. Remember to mention the sources you refer to in the text. Also remember to include a list of references.

3. Remember to write your student number in the top left-hand corner of each page.

4. Staple the assignment cover page to your completed assignment.

5. Place your completed assignment in the post-paid envelope supplied by Unisa. Seal the envelope.

6. Mail the assignment at least one week before the due date to ensure that it reaches us in good time.

7. You may submit written assignments electronically via myUnisa.
QUESTION 1

Complete the table in your answer book by matching the hardness value from Mohs Hardness Scale to the appropriate mineral from the list below.

<table>
<thead>
<tr>
<th>Mohs Hardness Scale</th>
<th>Mineral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness 1</td>
<td>Calcite</td>
</tr>
<tr>
<td>Hardness 2</td>
<td>Apatite</td>
</tr>
<tr>
<td>Hardness 3</td>
<td>Diamond</td>
</tr>
<tr>
<td>Hardness 4</td>
<td>Talc</td>
</tr>
<tr>
<td>Hardness 5</td>
<td>Feldspar</td>
</tr>
<tr>
<td>Hardness 6</td>
<td>Fluorite</td>
</tr>
<tr>
<td>Hardness 7</td>
<td>Corundum</td>
</tr>
<tr>
<td>Hardness 8</td>
<td>Topaz</td>
</tr>
<tr>
<td>Hardness 9</td>
<td>Quartz</td>
</tr>
<tr>
<td>Hardness 10</td>
<td>Gypsum</td>
</tr>
</tbody>
</table>

QUESTION 2

Discuss earthquakes under the following headings:
- What is an earthquake?
- Where do most earthquakes occur?
- How do they occur?
- How are they measured?
- Which primary and which secondary hazards are associated with earthquakes?
- How can the damage caused by earthquakes be reduced or prevented?

QUESTION 3

Summarise how landscapes evolve with interaction between the atmosphere and hydrosphere (climate system) and the asthenosphere/lithosphere (plate tectonic system).
QUESTION 4

Describe by means of stages (A, B and C in figure below), the evolution of a river from a small spring up in the mountains to a big meandering river. Mention the predominant morphological processes taking place in each stage as well as the landforms and features found in each.

[Image of stages A, B, C]

QUESTION 5

5.1 **Name** four typical drainage networks and **make a drawing** of each.

5.2 Which five factors control the equilibrium of a river?

QUESTION 6

**Discuss** briefly erosion and sedimentation in terms of stream power in the cases where the valley walls are (i)”steep”, (ii) “gentler” or (iii) “much flatter”.

QUESTION 7

7.1 **Identify** each of the indicated component parts of the hydrologic cycle by **naming** the annotations numbered 1 to 6.
7.2 Name four typical drainage networks and make a drawing of each network.

QUESTION 8

Describe the landforms you would encounter along a profile of the Atlantic Ocean floor.

QUESTION 9

Match the term with its appropriate description bycombining the correct number with the letter that is most appropriate. E.g.: 9 = J

1. Lithosphere
2. Asthenosphere
3. Mesosphere
4. Inner core
5. Outer core
6. Mantle
7. Continental crust
8. Oceanic crust
A  the thin, rocky outer skin, topped by continents
B  the thin, rocky outer skin, topped by oceans
C  a solid, rocky shell composing about 82% of Earth's volume
D  solid iron-nickel alloy at the centre of the Earth
E  the strong lower mantle, below the asthenosphere
F  a liquid layer at the top of the core, that generates Earth's magnetic field
G  weak, soft layer composed of the mantle beneath the lithosphere
H  strong, rigid layer composed of the crust and the upper mantle

QUESTION 10

With the aid of hand drawings show how the style of faulting is determined by the tectonic forces of:

- Tension
- Compression
- Shearing

TOTAL: [100]
ADDENDUM B

SECOND SEMESTER COMPULSORY ASSIGNMENTS

The Department of Environmental Sciences would like to mark more of your assignments electronically. We would thus like to encourage you to submit your assignments electronically (in PDF format) via myUnisa. Software to convert a Word document to PDF is available on myUnisa. You can download a PDF convertor free of charge from http://www.primopdf.com/index.aspx.

The advantages for you submitting your assignment in PDF format are numerous. Your assignment will reach us sooner and therefore you will receive feedback much earlier. This mode is also largely more environmentally friendly.

See below for Assignment Questions:
INSTRUCTIONS

1. Type your answer on A4 paper.

2. Remember to mention the sources you refer to in the text. Also remember to include a list of references.

3. Remember to write your student number in the top left-hand corner of each page.

4. Staple the assignment cover page to your completed assignment.

5. Place your completed assignment in the post-paid envelope supplied by Unisa. Seal the envelope.

6. Mail the assignment at least one week before the due date to ensure that it reaches us in good time.

7. You may submit written assignments electronically via myUnisa.
QUESTION 1

Answer all the following questions by writing the number as well as the correct option on your answer paper (eg 25 D, 26 C, 27 A):

1.1 The epicentre of an earthquake is the
A place where the earthquake originates.
B place on the earth's surface directly above the focus of the earthquake.
C place where sudden movement has occurred along a fault line.
D place where magma has burst through the earth's surface.

1.2 Rivers of ice are
A piedmont glaciers.
B valley glaciers.
C continental glaciers.
D ice sheets.

1.3 Which rocks are directly related to volcanism?
A igneous rocks
B sedimentary rocks
C metamorphic rocks
D clastic rocks

1.4 The single most distinctive feature of sedimentary rocks is
A vertical joints.
B a crystalline structure.
C recrystallization.
D stratification.

1.5 The direction along which the movement has taken place at the time when faulting occurs is called the
A fault line.
B strike.
C slip.
D dip-slip.

1.6 The total process of land surface reduction is termed
A erosion.
B denudation.
C degradation.
D aggradation.

1.7 The super-continent Pangaea started disintegrating
A 3 000 million years ago.
B 50 million years ago.
C 200 million years ago.
D 350 000 years ago.
95% of the volume of the earth’s crust is composed of a group of minerals known as
A  the felsic group.
B  the matic group.
C  silicates.
D  iron oxide minerals.

The final structure, texture and composition of metamorphic rocks are controlled by
(i)  the character of the parent material.
(ii)  fusion.
(iii)  the conditions of metamorphism.
(iv)  recrystallization.

Select the option containing the correct combination of answers:
A  (i), (iv)
B  (ii), (iv)
C  (iii), (iv)
D  (i), (iii)

Igneous rocks are classified according to
(i)  grain texture.
(ii)  mineral composition.
(iii)  origin.
(iv)  chemical structure.

Select the option containing the correct combination of answers:
A  (i), (iii)
B  (i), (ii)
C  (ii), (iii)
D  (iii), (iv)

Tsunamis are
A  shock waves.
B  landslides.
C  seismic sea waves.
D  avalanches.

The types of volcanic cone are determined by the
(i)  topography of the area.
(ii)  nature of the eruption.
(iii)  type of material that has been extruded.
(iv)  rock layers.

Select the option containing the correct combination of answers:
A  (i), (ii)
B  (ii), (iii)
C  (iii), (iv)
D  (i), (iv)
1.13 Many old stream valleys contain
A Rapids.
B Turbulent water flow.
C Large gradients.
D Meanders.

1.14 The steepness of slope of a stream channel in the direction of flow is its
A drainage basin
B discharge
C load
D gradient
E capacity

1.15 Processes of chemical weathering that also involve biological weathering are
A solution.
B carbonation and oxidation.
C reduction and chelation.
D hydration and hydrolysis.

1.16 Deposition of stream load occurs
A when the speed of flow of the river is reduced.
B when the speed of flow of the river is increased.
C at the point of rejuvenation of a river.
D all of the above.

1.17 The motion of a glacier is caused by
(i) melting ice at the bottom which forms lubrication.
(ii) gravity.
(iii) differential pressure within the ice mass.
(iv) evaporation.

Select the option containing the correct combination of answers:
A (i), (ii)
B (i), (iii)
C (ii), (iv)
D (ii), (iii)

1.18 Wind erosion landforms such as pedestal rocks are caused by a process of
A abrasion.
B deflation.
C attrition.
D all of the above simultaneously.

1.19 Drowned glacial valleys are known as
A Dalmatian coasts.
B ria coasts.
D fiord coasts.
D none of the above.
1.20 Processes involving the transfer of molten material from one place in the earth's crust to another, resulting in landforms of great elevation, are called
A exogenous forces.
B diastrophism.
C volcanism.
D isostasy.

QUESTION 2

Define the following:
   i. Geosystem
   ii. Core
   iii. Pangaea
   iv. Landform
   v. Environment
   vi. Reservoir
   vii. Permeability
   viii. Bed load
   ix. Elastic rebound theory
   x. Mass wasting

QUESTION 3

1 Ionic chemical bonds are usually stronger than covalent chemical bonds.
   a) True
   b) False

2 Coal, natural gas, and uranium are examples of non-renewable fossil fuels.
   a) True
   b) False

3 The asthenosphere is a relatively cool and rigid shell that overlies the lithosphere.
   a) True
   b) False
4 A metamorphic rock must come into contact with magma before it can become a sedimentary rock.
   a) True
   b) False

5 Over 10% of all the water on the Earth is in the form of groundwater.
   a) True
   b) False

6 If two rocks have the same mass, but one is broken into several fragments and the other is not, the one broken up will chemically weather at a faster rate.
   a) True
   b) False

7 Earth is the only object in our solar system that has ever had liquid water on its surface.
   a) True
   b) False

8 The rock cycle illustrates the origin of the three basic rock types and the role of various geologic processes in transforming one rock type into another.
   a) True
   b) False

9 Magma is molten material that forms in Earth's interior where temperatures and pressures are such that rock melts.
   a) True
   b) False

10 Extremely deep, relatively narrow depressions on the ocean floor are called abyssal plains.
   a) True
   b) False

[10]

TOTAL [50]

END OF ASSIGNMENT 01
INSTRUCTIONS

1. Type your answer on A4 paper.

2. Remember to mention the sources you refer to in the text. Also remember to include a list of references.

3. Remember to write your student number in the top left-hand corner of each page.

4. Staple the assignment cover page to your completed assignment.

5. Place your completed assignment in the post-paid envelope supplied by Unisa. Seal the envelope.

6. Mail the assignment at least one week before the due date to ensure that it reaches us in good time.

7. You may submit written assignments electronically via myUnisa.
Answer all the following questions:

**QUESTION 1**

In the table below complete the information with regards to tectonic plate boundaries. You only need to write the number and the correct answer in your answer book: e.g. (xi) earthquakes

<table>
<thead>
<tr>
<th>Type of Margin</th>
<th>(I)___________</th>
<th>Convergent</th>
<th>(III)__________</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motion</td>
<td>Spreading</td>
<td>(III)__________</td>
<td>Lateral sliding</td>
</tr>
<tr>
<td>Effect</td>
<td>Constructive (oceanic lithosphere created)</td>
<td>(iv)__________</td>
<td>Conservative (lithosphere neither created nor destroyed)</td>
</tr>
<tr>
<td>Topography</td>
<td>(v)__________</td>
<td>Trench</td>
<td>Fault</td>
</tr>
<tr>
<td>Example</td>
<td>(vi)__________</td>
<td>(vii)__________</td>
<td>(viii)__________</td>
</tr>
<tr>
<td>Geological activity</td>
<td>Volcanoes</td>
<td>(ix)__________</td>
<td>(x)__________</td>
</tr>
</tbody>
</table>


**QUESTION 2**

2.1 Complete the diagram of the rock cycle by naming the annotations numbered 1 to 10, indicating all the rock types and processes of interaction.
2.2 List the seven of the physical properties of minerals. (7)

QUESTION 3

Use the figure below to answer questions 3.1 and 3.2.

3.1 Identify the type of faults indicated in the figures A to D below (4)

3.2 Indicate for each type (A to D) whether the fault has been caused by tension, compression or shearing. (4)
QUESTION 4

Discuss earthquakes under the following headings:

- What is an earthquake?
- Where do most earthquakes occur?
- How do they occur?
- How are they measured?
- What is the difference between P-waves and S-waves and surface waves?
- Which primary and which secondary hazards are associated with earthquakes?
- How can the damage caused by earthquakes be reduced or prevented?

[13]

QUESTION 5

Mass movement caused by natural processes is influenced by three primary factors. Discuss each of these factors and indicate how it affects the stability of a slope.

[9]
QUESTION 6

6.1 **Differentiate** between an ionic bond and a covalent bond by using examples

6.2 **Provide** the appropriate annotation for the geological features marked A to H in the figure below by choosing from the table next to it.

![Diagram of the Earth's layers](image)

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
</tbody>
</table>

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>oceanic crust</td>
<td>mantle</td>
<td>lithosphere</td>
<td>inner core</td>
<td>mesosphere</td>
<td>continental crust</td>
</tr>
<tr>
<td>asthenosphere</td>
<td>outer core</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
QUESTION 7

7.1 **Name** four typical drainage networks and **make a drawing** of each network. 

7.2 Which five factors control the equilibrium of a river?

QUESTION 8

*The desert landscape is shaped primarily by two forces: wind and water.*

8.1 **Label** each of the following desert landforms and **explain** how each are created and by which force.

8.2 **Name** four types of sand dunes.
QUESTION 9

9.1 **Explain** how glaciers are formed.  

9.2 **List** the different types of glaciers.

**TOTAL:** [100]

END OF ASSIGNMENT 02