

Module Details	
Module Code:	BIOL S8Z01
Full Title:	Biology <span>APPROVED</span>
Valid From::	Semester 1 - 2018/19 ( September 2018 )
Language of Instruction:	
Duration:	2 Semesters
Credits::	15
Module Owner::	
Departments:	Unknown
Module Description:	The aim of this module is to present the necessary biology to support further studies in microbiology, molecular bioscience, ecology, physiology and pharmacology. Students will also gain experience in experimental techniques (biological and microbiological) and in the recording and interpretation of biological data.

Module Learning Outcome	
On successful completion of this module the learner will be able to:	
#	Module Learning Outcome Description
MLO1	Identify and explain the function of the major biomolecules and interpret amino acid sequences from base sequences on the DNA.
MLO2	Summarise the major components in a typical procaryotic cell and compare and contrast a gram positive and a gram negative bacterial cell wall.
MLO3	Highlight the major characteristics and structural differences between viruses,bacteria,fungi and protista and discuss their commercial/medical importance.
MLO4	Explain the structure and function of eucaryotic cell organelles, membrane transport processes and cell division( mitosis and meiosis) and review the principles of Mendelian genetics.
MLO5	Compare different types of microscope and be competent in the use of a brightfield microscope to view and interpret slides and in the skills used in the preparation and microscopic examination of bacterial,fungal, animal and plant specimens.
MLO6	Discuss the structure and organisation of plants,internal and external factors affecting their growth,and explain the process of photosynthesis.
MLO7	Review the structure and function of the digestive, excretory, respiratory, urinary, reproductive and nervous systems in animals from selected taxa.
MLO8	Assign taxonomic terms to classify plants and animals.
MLO9	Make accurate observations of living and preserved biological preparations and assess and interpret biological data.
Pre-requisite learning	
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is strongly recommended before enrolment in this module. You may enrol in this module if you have not acquired the recommended learning but you will have considerable difficulty in passing (i.e. achieving the learning outcomes of) the module. While the prior learning is expressed as named DkIT module(s) it also allows for learning (in another module or modules) which is equivalent to the learning specified in the named module(s).</i>	
No recommendations listed	

Module Indicative Content
<b>Biomolecules and Viruses.</b> Introduction to proteins,enzymes, lipids,carbohydrates and nucleic acids.Viruses (types, structure,reproduction and importance).
<b>Introduction to the Cell and microscopy.</b> Classification,types of cells,cell size, factors determining cell size,brightfield, darkfield,phase contrast,flourescent and electron microscopes.
<b>Replication of DNA and protein synthesis.</b> Replication,transcription,translation,exons introns,mutations. Role of mRNA, rRNA, tRNA
<b>Prokaryotic cell structure.</b> Slime capsule, cell wall(gram positive and gram negative), cell membrane, flagellum, pilus, ribosomes, plasmids, nucleoid, endospore. Ways to increase microbial diversity.
<b>Eucaryotic cell structure.</b> Cell membrane,nucleus, endoplasmic reticulum,Golgi apparatus, lysosome, peroxisome,ribosome,cytoskeleton, cell communication, Transport processes across cell membranes.
<b>Cell division.</b> Binary fission,cell cycle, mitosis,meiosis, growth and differentiation of eucaryotic cells, stem cell ,overview of animal tissues.
<b>Fungi and Protista.</b> Characteristics of fungi,growth and reproduction,identification techniques,commercial/medical importance, antifungal therapies. Characteristics of algae and protozoa and their importance.
<b>Genetics.</b> Mendelian genetics, monohybrid and dihybrid crosses, sex linkage, mechanism of evolution and speciation.
<b>Nutrition.</b> Feeding mechanisms in humans and animals to include saprophytes, parasites,examples of parasites, evolution of digestive systems, human digestive system, nutritional adaptations in plants.
<b>Transport.</b> Transport in plants, transport in animals, human cardiovascular system, composition and function of blood, lymphatic and immune system.
<b>Gaseous exchange.</b> Physical laws of gas exchange, gas exchange in plants, animals, fish, human respiratory system, transport of gases in human blood.
<b>Movement and support in animals.</b> Skeletal system, muscular system, physiology of muscle activity.
<b>Co-ordination in animals and plants.</b> Plant hormones, evolution of endocrine and nervous systems in animals.
<b>Integration and co-ordination in humans.</b> Organisation of body systems, urinary system and regulation of body fluids, regulation of body temperature, endocrine system, nervous system.
<b>Reproduction.</b> Sexual and asexual reproduction in plants, asexual reproduction in animals, the sexual life cycle in mammals, development and growth of mammals.
<b>Taxonomy.</b> Origin of taxonomy, kingdoms of life, classification of animals and plants, identification of organisms using keys.
<b>Practical skills.</b> Practicals will be selected from the following list: * Introduction to microscopy; use and care ;Elementary micro-technique – preparations of whole mounts; sections; smears and squashes; animal and plant cells (stained and unstained) ;Microscopic measurement of cell size; Microbes are everywhere;Examination of prepared cultures and slides of bacteria, fungi and protozoa; Preparation and examination of simple and differential stains in microbiology ; Examination of electron micrographs of eucaryotic and procaryotic cells and viruses;Observation of mitosis in plant meristems ; Determination of the osmotic potential of potato cells; Factors affecting enzyme activity; DNA Extraction;Examination of invertebrate animals from selected taxonomic groups; Examination of plants from selected taxonomic groups; Dissection of the digestive and excretory system of lugworm;Dissection of the mouthparts of locust and its digestive system;Examination of mouthparts of different insects; Examination of the skulls of animals and the skeletal system of humans ; Dissection of digestive system and circulatory system of rat; Dissection of a sheep's heart; Examination of plant tissues; Separation of plant pigments by chromatography;Factors affecting the rate of photosynthesis.

Module Assessment	
Assessment Breakdown	%
Course Work	20.00%
Practical	30.00%
Final Examination	50.00%
Module Special Regulation	

## Assessments

Full Time On Campus			
Course Work			
Assessment Type	Class Test	% of Total Mark	5
Marks Out Of	0	Pass Mark	0
Timing	S1 Week 6	Learning Outcome	1,2,3
Duration in minutes	0		
Assessment Description	multiple choice /short questions		
Assessment Type	Class Test	% of Total Mark	5
Marks Out Of	0	Pass Mark	0
Timing	S1 Week 12	Learning Outcome	4
Duration in minutes	0		
Assessment Description	multiple choice/short questions		
Assessment Type	Class Test	% of Total Mark	5
Marks Out Of	0	Pass Mark	0
Timing	S2 Week 25	Learning Outcome	7
Duration in minutes	0		
Assessment Description	multiple choice/short questions/graph questions/essay		
Assessment Type	Class Test	% of Total Mark	5
Marks Out Of	0	Pass Mark	0
Timing	S2 Week 30	Learning Outcome	6,7,8
Duration in minutes	0		
Assessment Description	multiple choice/short questions		
No Project			
Practical			
Assessment Type	Practical/Skills Evaluation	% of Total Mark	30
Marks Out Of	0	Pass Mark	0
Timing	n/a	Learning Outcome	4,5,7,8,9

<b>Duration in minutes</b>	0		
<b>Assessment Description</b> 4 Practical examinations to assess competencies in the preparation and viewing of biological specimens / practical report writing/short answer question /multiple choice questions/oral examinations as appropriate. Practical write-ups will also be assessed at the end of each semester			
<b>Final Examination</b>			
<b>Assessment Type</b>	Formal Exam	<b>% of Total Mark</b>	50
<b>Marks Out Of</b>	0	<b>Pass Mark</b>	0
<b>Timing</b>	End-of-Semester	<b>Learning Outcome</b>	1,2,3,4,6,7,8,9
<b>Duration in minutes</b>	0		
<b>Assessment Description</b> End-of-Semester Final Examination			
<b>Reassessment Requirement</b>			
<b>A repeat examination</b> <i>Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.</i>			

## Module Workload

### Workload: Full Time On Campus

<i>Workload Type</i>	<i>Contact Type</i>	<i>Workload Description</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>	<i>Hours</i>
Lecture	Contact	No Description	Every Week	3.00	3
Practical	Contact	No Description	Every Week	3.00	3
Tutorial	Contact	No Description	Every Week	1.00	1
Independent Study	Non Contact	No Description	Every Week	4.00	4
				Total Weekly Learner Workload	11.00
				Total Weekly Contact Hours	7.00

**This module has no Part Time On Campus workload.**

## Module Resources

### Recommended Book Resources

Urry,L.A.et al. (2017), Campbell Biology, 11th Ed. Pearson, USA, [ISBN: 9780134446417].  
Raven,P.H. et al. (2016), Biology, 11th Ed. Mc Graw -Hill, [ISBN: 9780077327640].

### Supplementary Book Resources

Hardin, J.. (2016), Becker's world of the cell, 9th Ed. Pearson, [ISBN: 9780134146621].  
Clegg C.J. and Mackean D.G.. (2000), Advanced Biology, 2nd Ed. John Murray, UK, [ISBN: 9780719576706].  
Tortora G, Funke B and Case C. (2016), Microbiology an Introduction, 12th Ed. Pearson, [ISBN: 9780321929150].  
Mader,S and Windelspecht,M. (2012), Biology, 11th Ed. Mc Graw Hill, USA, [ISBN: 9780073525501].  
Mader,S and Windelspecht,M. (2013), Human Biology, 13th Ed. Mc Graw Hill, USA, [ISBN: 9780073525488].

*This module does not have any article/paper resources*

### Other Resources

YouTube movies, Bozeman Biology,  
<http://www.Bozemanscience.com>  
YouTube movies, Khan Academy,  
<http://www.khanacademy.org>  
website, Biology mad .com,  
<http://www.biologymad.com>  
[www.biochem4schools.org](http://www.biochem4schools.org).  
[www.biology4all.com](http://www.biology4all.com).  
website, cells alive,  
<http://www.cellsalive.com>  
Link, Library Catalogue,  
<http://tinyurl.com/m8ydz8>  
Link, Library Catalogue,  
<http://tinyurl.com/pfmf9pt>  
Link, Library Catalogue,  
<http://tinyurl.com/pveq6ee>