



Stellenbosch

UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

SCIENCE

EYENZULULWAZI NGEZENDALO

NATUURWETENSKAPPE

Biology 146 – Principles of Biology 2023

Short description of the module

This module is for students in the BSc or BSc Agric Extended Degree Programmes. It introduces students to a range of fundamental biological concepts.

Biologie 146 – Beginsels van Biologie 2023

Kort beskrywing van die module

Hierdie module is vir studente in die BSc and BSc Agric Verlengde Graad Programme. Dit stel studente bloot aan 'n reeks fundamentele biologiese konsepte.

Module summary

Name	Biology 146 – Principles of Biology
Duration	Second semester
Type	
Academic commitment*	16 credits = 160 notional hours 12 hours per week for lectures, tutorials/practicals and studying.
Scheduled learning opportunities	3 lectures (L) per week 1 tutorial or practical per week
Assessment option	A1 (T1 and T2) and A2 each cover different parts of the syllabus; no A3
Language option	Option 1: lectures, practicals and tutorials are in English or Afrikaans (separate classes).
Mode of offering	Face-2-Face
Corequisites / Prerequisites / Pass prerequisites**	N/A

**Notional hours are the learning time that it would take an average learner to meet the outcomes of the module.*

***The onus is on the students to ensure that they meet the prerequisites of the module.*

Module-oorsig

Naam	Biologie 146 – Beginsels van Biologie
Duur	Tweede semester
Tipe	
Akademiese verbintenis*	16 krediete – 160 veronderstelde leerure 12 ure per week vir lesings, tutoriale/praktika en studeer.
Geskeduleerde leergeleenthede	3 lesings (L) per week 1 tutoriaal of prakties per week
Assesseringsopsie	A1 (T1 en T2) en A2 elk dek verskillende dele van die sillabus. Geen A3
Taalopsie	Opsie 1: lesings, praktika en tutoriale is in Engels of Afrikaans (aparte klasse).
Modus van aanbieding	In persoon (face-to-face)
Nuwevereistes / Voorvereistes / Slaagvoorvereistes**	NVT

**Veronderstelde leerure is die tyd wat die gemiddelde leerder aan die module sal moet spandeer om aan die uitkomst van die module te voldoen.*

***Die onus rus op die studente om te verseker dat hulle aan die voorvereistes van die module voldoen.*

Outcomes

After completion of this module, you will be familiar with a range of principles and concepts in biology, including:

- Life: Domains and Kingdoms/Groups
- The chemical basis of life
- Biological molecules
 - Carbohydrates
 - Lipids
 - Proteins
 - Nucleic Acids
 - Replication
 - Transcription
 - Translation
 - Gene regulation principals
- Biological membranes: Structure and transport
- Cell structure and function in pro- and eukaryotes, and plant and animal cells
- Vertebrate phylogeny
- Mendel, Genes and Inheritance

Uitkomst

Na voltooiing van hierdie module behoort u as student bekend te wees met 'n reeks algemene beginsels en konsepte van biologie, insluitend:

- Lewe: Domeine en Koninkryke/Groepe
- Die chemiese basis van lewe
- Biologiese molekules
 - Koolhidrate
 - Lipiede
 - Proteiene
 - Nukleiensure
 - Replikasie
 - Transkripsie
 - Translasie
 - Geenregulering beginsels
- Biologiese membrane: Struktuur en vervoer
- Selstruktuur en funksie in pro- en eukariote, en plant- en dierselle
- Vertebrata filogenie
- Mendel, Gene en Oorerwing

Scheduled learning opportunities

The official timetable indicating all scheduled learning opportunities and their allocated venues can be accessed via [My.SUN](#). For this module students will be subdivided into practical and tutorial groups. These schedules are available on the module page on **SUNLearn**.

Groups	Time	Venue
Group 3 Afrikaans	Monday 08:00 (L1) Tuesday 10:00 (L2) Thursday 09:00 (L3)	MathSci 2002 Schumann 237 MathSci 2002
	Monday 10:00 (P)	NatSci 2025
Group 1 & 2 English	Tuesday 08:00 (L1) Wednesday 12:00 (L2) Thursday 12:00 (L3)	All lectures in Natural Science Building 3005
	Monday 10:00 (P)	NatSci 2025

Lectures

The Bio 146 module will be offered on campus during face-face lectures. See the lecture schedules at the bottom of this document.

Geskeduleerde leergeleenthede

Die amptelike rooster wat al die geskeduleerde leergeleenthede en die toegewysde lokale aandui, is beskikbaar by [My.SUN](#). Vir hierdie module sal studente in praktiese- en tutoriaalroepe ingedeel word. Hierdie skedules is beskikbaar op die moduleblad op **SUNLearn**.

Groepe	Tyd	Lokaal
Groep 3 Afrikaans	Maandag 08:00 (L1) Dinsdag 10:00 (L2) Donderdag 09:00 (L3)	WiskWet 2002 Schumann 237 WiskWet 2002
	Maandag 10:00 (P)	NatWet 2025
Groep 1 & 2 Engels	Dinsdag 08:00 (L1) Woensdag 12:00 (L2) Donderdag 12:00 (L3)	Alle lesings in die Natuurwetenskappe Gebou 3005
	Maandag 10:00 (P)	NatWet 2025

Lesings

Die Bio 146 module sal op kampus aangebied word tydens in-persoon lesings. Sien die lesingskediule aan die einde van die dokument.

Practicals

Mondays @ 10:00 in the Natural Science Building, Room 2025.

Week	Date	Theme	Practicum
1	24 Jul		No Practical
2	31 Jul	Biodiversity	Tutorial: Classification of Life on Earth - in Lab 2025
3	7 Aug	Biological molecules	Laboratory Practical: Biological molecules
4	14 Aug	Cells	Laboratory Practical: Microscopy- Unicellular and Multicellular micro-organisms
5	21 Aug	Cells	Laboratory Practical: Microscopy - Plant & Animal cells. Structure & Function
6	28 Aug	Organisms	Laboratory Practical: Vertebrate Life (1) -Agnathostomata to Amphibia
7	4 Sept	Assessment	Assessment A1T1 (no practical)
-	11 Sept		RECESS
8	18 Sept	Organisms	Laboratory Practical: Vertebrate Life (2) -Reptilia to Mammalia
9	Friday 29 Sept Monday timetable	Organisms, Ecosystem	Excursion to the Two Oceans Aquarium
10	2 Oct	Assessment	Assessment A1T2 (no practical)
11	9 Oct	Molecular biology	Genetics Tutorial in Lab 2025
12	16 Oct	Molecular biology	Genetics Tutorial in Lab 2025
13	23 Oct	Molecular biology	Genetics Tutorial in Lab 2025

Praktika

Maandag @ 10:00 in die Natuurwetenskappe gebou, Lokaal 2025.

Week	Datum	Tema	Pratikum
1	24 Jul		Geen Prakties
2	31 Jul	Biodiversiteit	Tutoriaal: Klassifikasie van Lewe op Aarde - in Lab 2025
3	7 Aug	Biologiese molekules	Laboratorium Praktikum: Biologiese molekules
4	14 Aug	Selle	Laboratorium Praktikum: Mikroskopie - Een- en meersellige mikro-organismes
5	21 Aug	Selle	Laboratorium Praktikum: Mikroskopie - Plant- en dierselle
6	28 Aug	Organismes	Laboratorium Praktikum: Vertebrata Lewe (1) Agnathostomata to Amphibia
7	4 Sept	Assesering	Assesering A1T1 (geen prakties)
-	11 Sept		RESES
8	18 Sept	Organismes	Laboratorium Praktikum: Vertebrata Lewe (2) Reptilia to Mammalia
9	Vrydag 29 Sept Maandag rooster	Organismes, Ekosistiem	Ekskursie na die Twee Oseane Akwarium
10	2 Okt	Assesering	Assesering A1T2 (geen prakties)
11	9 Okt	Molekulêre biologie	Genetika Tutoriaal in Lab 2025
12	16 Okt	Molekulêre biologie	Genetika Tutoriaal in Lab 2025
13	23 Okt	Molekulêre biologie	Genetika Tutoriaal in Lab 2025

<p>Study material Prescribed textbook: Russell, Hertz, McMillan, Biology: The Dynamic Science (5th edition). Cengage Publishers. International Edition.</p> <p>SUNLearn is the official learning management platform of Stellenbosch University. Each module has a dedicated page on this platform which can be accessed via this link: https://learn.sun.ac.za/</p>	<p>Studiemateriaal Voorgeskrewe Handboek: Russell, Hertz, McMillan, Biology: The Dynamic Science (5th edition). Cengage Publishers. International Edition.</p> <p>SUNLearn is die amptelike leerbestuursplatform van die Universiteit Stellenbosch. Elke module het 'n toegewysde blad op hierdie platform met toegang via hierdie skakel: https://learn.sun.ac.za/</p>
<p>Lecturers</p> <p>Lecturer: Dr M Mouton, marnel@sun.ac.za, Natural Science Building 2022</p> <p>Assistant Lecturer: Dr J Aylward, janneke@sun.ac.za</p> <p>Admin and Enquiries: Me F Gordon, fg1@sun.ac.za, Natural Science Building, 3056</p> <p>Module Coordinator: Dr M Mouton, marnel@sun.ac.za, Natural Science Building 2022</p>	<p>Dosente</p> <p>Dosent: Dr M Mouton, marnel@sun.ac.za, Natuurwetenskappe Gebou, 2022</p> <p>Assistant Dosent: Dr J Aylward, janneke@sun.ac.za</p> <p>Admin en Navrae: Me F Gordon, fg1@sun.ac.za, Natuurwetenskappe Gebou, 3056</p> <p>Module Koördineerder: Dr M Mouton, marnel@sun.ac.za, Natuurwetenskappe Gebou, 2022</p>

Assessment

The dates for all centrally scheduled assessments are published on [My.SUN](#). This module follows assessment option 2. Please see the [Faculty of Science's assessment guidelines](#) for more details.

The module is assessed through three scheduled invigilated, written assessments (on campus) covering the subject matter: the A1T1, the A1T2 assessment and the A2 assessment. These three assessments contribute 75% to the final mark. The remaining 25%, known as the 'practical mark', comprises quizzes, practical or tutorial assessments (on SUNLearn or face-to-face). A 40% subminimum applies to the practical mark.

Students MUST complete ALL compulsory assessments to pass the module – these assessments are thus mandatory!

Method of assessment	Description and Content	#	Allocated marks	Criteria and Status	Dates
Quizzes, Tutorial and Practical assessments	Weekly online or in-person assessments regarding the content of classes, the tutorial or practical.		25% of final mark	40% subminimum	Weekly
A1T1	Scheduled invigilated assessment on campus	1	70-80 marks 25% of final mark	Compulsory assessment	4 Sep 10:00
A1T2 assessment	Scheduled invigilated assessment on campus	1	70-80 marks 25% of final mark	Compulsory assessment	2 Oct 10:00
A2 assessment	Scheduled invigilated assessment on campus	1	70-80 marks 25% of final mark	Compulsory assessment	10 Nov 14:00

Please see the assessments and promotion chapter in the [SU Calendar Part 1 \(General\)](#) for institutional rules regarding assessments.

Assesserings

Die datums van alle sentraal geskeduleerde assesserings word op [My.SUN](#) gepubliseer. Hierdie module volg assesseringsopsie 2. Raadpleeg die [Fakulteit Natuurwetenskappe se assesseringsriglyne](#) vir meer besonderhede.

Die module word geassesseer deur middel van drie geskrewe geskeduleerde assesserings onder toesig (op kampus) oor die vakinhoud: die A1T1, die A1T2 assessering en die A2 assessering. Hierdie drie assesserings dra 75% by tot die finale punt. Die oorblywende 25%, ook bekend as die 'praktiese punt', bestaan uit 'quizzes', praktika of tutoriaal-assesserings (op SUNLearn of in-persoon (face-to-face)). 'n Subminimum van 40% is van toepassing op die praktiese punt.

Studente MOET ALLE verpligte assesserings aflê om die module te slaag – sulke assesserings is dus verpligtend!

Metode van assessering	Beskrywing en Inhoud	#	Punte toegeken	Kriteria en Status	Datums
Quizzes, Tutoriaal en Praktiese assesserings	Weeklikse aanlyn of in-persoon assesserings wat handel oor die inhoud van die klasse, tutoriaal of prakties.		25% van die finale punt	40% subminimum	Weekliks
A1T1	Geskeduleerde assessering op kampus onder toesig	1	70-80 punte 25% van die finale punt	Verpligte assessering	4 Sept 10:00
A1T2 assessering	Geskeduleerde assessering op kampus onder toesig	1	70-80 punte 25% van die finale punt	Verpligte assessering	2 Okt 10:00
A2 assessering	Geskeduleerde assessering op kampus onder toesig	1	70-80 punte 25% van die finale punt	Verpligte assessering	10 Nov 14:00

Raadpleeg die hoofstuk oor assessering en promovering in [Deel 1 \(Algemeen\) van die US Jaarboek](#) vir institusionele reëls oor assesserings.

Calculation of final marks

The average of the three assessments (A1T1, A1T2 and A2) contribute 75% to the final mark. The practical mark counts 25% toward the final mark (a 40% subminimum applies here).

You therefore pass the module if:

- Your final mark is 50% or more, AND
- You achieved a 40% subminimum for the practical component.

Berekening van finale punte

Die gemiddeld van die drie assesserings (A1T1, A1T2 en A2) sal 75% van die finale punt uitmaak. Die praktiese punt tel 25% van die finale punt ('n 40% subminimum geld hier).

U slaag dus die module indien:

- U finale punt 50% en hoër is, EN
- U die 40% subminimum vir die praktiese komponent behaal het.

Absenteeism (Missed opportunities)

Please see the section 11 of the [SU Calendar Part 1 \(General\)](#) for the institutional rules regarding absence from classes and or tests.

Take note that for any absence from the university *for more than one* teaching, learning or assessment opportunity, for whatever reason, students need to apply for leave of absence from the Registrar's office.

If you are absent for exactly one teaching, learning or assessment opportunity you need to contact **Dr Mouton (marnel@sun.ac.za)** immediately and provide the appropriate evidence as stipulated in the calendar.

Afwesigheid (die misloop van 'n leergeleentheid)

Raadpleeg asseblief afdeling 11 in [Deel 1 \(Algemeen\) van die US Jaarboek](#) vir die institusionele reëls met betrekking tot afwesigheid van klasse en of toetse.

Neem kennis dat studente by die Registrateur moet aansoek doen vir verlof tot afwesigheid, vir watter rede ook al, van *meer as een* onderrig-, leer-, of assesseringsgeleentheid,

Indien jy afwesig is van presies een onderrig-, leer-, of assesseringsgeleentheid, moet jy onmiddellik vir **Dr Mouton (marnel@sun.ac.za)** kontak en die toepaslike bewys van rede tot afwesigheid inhandig, soos uiteengesit in die Jaarboek.

Communication

The **announcement forum on the SUNLearn module page** is the only official platform that will be used to make announcements relevant to this module. Please check this regularly.

For communication with individual students, lecturers, support staff and peer-to-peer facilitators will only use students' official SUN email addresses.

Students are also requested to use their official **SUN email addresses** for all academic related communication to: **Dr Mouton (marnel@sun.ac.za)**

Kommunikasie

Die **aankondigingsforum op die SUNLearn moduleblad** is die enigste amptelike platform wat gebruik sal word om aankondigings, wat relevant is vir hierdie module, te maak. Kontroleer dit asseblief gereeld.

Vir kommunikasie met individuele studente, sal dosente, steunpersoneel en eweknie-fasiliteerders slegs studente se amptelike SUN-e-posadresse gebruik.

Studente word ook versoek om hul amptelike **SUN-e-posadresse** te gebruik vir alle akademiese verwante kommunikasie te gebruik aan: **Dr Mouton (marnel@sun.ac.za)**.

Addressing challenges

For any complaints, the first port of call is the class representative or the lecturer. If not satisfactorily resolved, it can be escalated to the Head of Department or [Coordinator: Academic and Student Affairs](#).

Hantering van uitdagings

Vir enige klagtes, is die klasvertegenwoordiger of dosent die eerste plek om hulp te soek. Indien die probleem nie bevredigend opgelos word nie, kan dit na die Departementshoof of [Koördineerder: Akademiese- en Studentesake](#) verwys word.

Academic Misconduct

Academic misconduct includes plagiarism, collusion, cheating and fabrication as stipulated in the [Disciplinary code for students of Stellenbosch University](#). The [SU Policy on Plagiarism](#) defines plagiarism as: "The use of the ideas or material of others [including AI generative tools, such as ChatGPT or Bing] without [appropriate] acknowledgement, or the re-use of one's own previously evaluated or published material without acknowledgement (self-plagiarism)." Such acknowledgement would include referencing the source of previously expressed ideas or published materials, or acknowledging the contribution of e.g. the AI tool, as stipulated for a specific assessment or assignment.

Plagiarism is regarded as a serious offence. More serious cases are handled as set out in the [Stellenbosch University procedure for the investigation and management of allegations of plagiarism document](#). Less serious cases are dealt with by the module coordinator and respective department as set out by the procedures of the faculty.

Repeaters

This module cannot be repeated.

Akademiese Wangedrag

Akademiese wangedrag sluit plagiaat, samespanning, bedrog en versinsel in, soos bepaal in die [Dissiplinêre kode vir studente van die Universiteit Stellenbosch](#). Die "SU Policy on Plagiarism" definieer plagiaat as die gebruik van die idees of materiaal van ander [insluitend "AI" produserende hulpmiddels, soos ChatGPT of Bing] sonder toepaslike erkenning daarvan, of die hergebruik van 'n persoon se eie voorheen-geassesseerde of gepubliseerde materiaal sonder erkenning (self-plagiat). Toepaslike erkenning sal verwysings insluit na die bron van voorheen uitgedrukte idees of gepubliseerde materiaal, of erkenning van bv. die "AI" hulpmiddel, soos gestipuleer vir 'n spesifieke assessering of opdrag.

Plagiat word as 'n ernstige oortreding beskou. Ernstiger gevalle word hanteer soos uiteengesit in die [Universiteit Stellenbosch se dokument oor die prosedure vir die ondersoek en bestuur van bewerings van plagiat](#). Minder ernstige gevalle word deur die modulekoördineerder en betrokke departement hanteer soos uiteengesit in die fakulteitsprosedures.

Herhalers

Hierdie module kan nie herhaal word nie.

2023 BIOLOGY 146: Lecture Calendar

This time line is an estimate and may changes may occur during the semester which will be communicated in class by the lecturer and/or on SUNLearn.

	WEEK	L1	L2	L3
1	24-30 Jul	Introduction, Admin	Chapter 1: Introduction to Biological Concepts	Chapter 2: Life, Chemistry and Water
2	31 Jul – 6 Aug	Online assessment Chapters 1 and 2 (open book)	Chapter 3 - Biological Molecules: Carbohydrates	(3) Biological Molecules: Lipids
3	7-13 Aug	(3) Biological Molecules: Proteins	WOMAN's DAY No class	(3) Biological Molecules: Nucleic Acids
4	14-20 Aug	Online assessment Chapter 3 (open book)	Chapter 5: Membrane Structure	(5) Membrane Structure and Transport
5	21-27 Aug	Online assessment Chapter 5 (open book)	(5) Membrane Structure and Transport	Chapter 4: The cell - Prokaryotes
6	28 Aug – 3 Sept	Online assessment Chapter 5 and 4 first part (open book)	(4) The cell – Eukaryotes (1)	(4) The cell – Eukaryotes (2)

2023 BIOLOGIE 146: Lesing Kalender

Hierdie tydlyn is 'n skatting en veranderinge kan plaasvind gedurende die semester wat dan gekommunikeer sal word in klas deur die dosent en/of op SUNLearn.

	WEEK	L1	L2	L3
1	24-30 Jul	Inleiding, Admin	Hoofstuk 1: Inleding tot Biologiese Konsepte	Hoofstuk 2: Lewe, Chemie en Water
2	31 Jul – 6 Aug	Aanlyn assessering Hoofstuk 1 en 2 (oopboek)	Hoofstuk 3 - Biologiese Molekules: Koolhidrate	(3) Biologiese Molekules: Lipiede
3	7-13 Aug	(3) Biological Molekules: Proteïene	VROUEDAG Geen klas	(3) Biologiese Molekules: Nukleïensure
4	14-20 Aug	Aanlyn assessering Hoofstuk 3 (oopboek)	Hoofstuk 5: Membraan Struktuur	(5) Membraan Struktuur en - Vervoer
5	21-27 Aug	Aanlyn assessering Hoofstuk 5 (oopboek)	(5) Membraan Struktuur en - Vervoer	Hoofstuk 4: Die Sel - Prokariote
6	28 Aug – 3 Sept	Aanlyn assessering Hoofstuk 5 en 4 1e deel (oopboek)	(4) Die Sel – Eukariote (1)	(4) Die Sel – Eukariote (2)

7	4-10 Sept	No class A1T1: 4 Sept 10:00 (during Prac period)	VR Cellscape	VR Cellscape	7	4-10 Sept	Geen klas A1T1: 4 Sept 10:00 (gedurende Prak periode)	VR Cellscape	VR Cellscape
	US Holiday 11-15 Sept	----- -----	----- -----	----- -----		US Holiday 11-15 Sept	----- -----	----- -----	----- -----
8	18-24 Sept	Online assessment Chapter 31 and 32 (open book)	Chapter 31: Animal Phylogeny	Chapter 32: Vertebrate Life	8	18-24 Sept	Aanlyn assessering Hoofstuk 31 en 32 (oopboek)	Hoofstuk 31: Diere Filogenie	Hoofstuk 32: Vertebrata Lewe
9	25 Sept – 1 Oct	HERITAGE DAY Online assessment Chapter 31 and 32 (open book)	(32) Vertebrate Life	(32) Vertebrate Life	9	25 Sept – 1 Okt	HERITAGE DAY Aanlyn assessering Hoofstuk 31 en 32 (oopboek)	(32) Vertebrata Lewe	(32) Vertebrata Lewe
10	2-8 Oct	No class A1T2: 2 Oct 10:00 (during Prac period)	Chapter 12: Mendel, genes and inheritance	(12) Mendel, genes and inheritance	10	2-8 Okt	Geen klas A1T2: 2 Oct 10:00 (during Prac period)	Hoofstuk 12: Mendel, gene en oorerwing	(12) Mendel, gene en oorerwing
11	9-15 Oct	Online assessment Chapter 12 (open book)	Chapters 3 + 14: DNA Structure, and Replication	(3 + 14) DNA Structure, Replication and Organization	11	9-15 Okt	Aanlyn assessering Hoofstuk 12 (oopboek)	Hoofstuk 3 + 14: DNA Struktuur en Replikasie en Organisasie	(3 + 14) DNA Struktuur en Replikasie en Organisasie
12	16-22 Oct	Online assessment Chapters 3 + 14 (open book)	Chapter 15: Transcription	(15) Translation	12	16-22 Okt	Aanlyn assessering Hoofstuk 3 + 14 (oopboek)	Hoofstuk 15: Transkripsie	(15) Translasie
13	23-27 Oct	Online assessment Chapter 15 (open book)			13	23-27 Okt	Aanlyn assessering Hoofstuk 15 (oopboek)		