



Stellenbosch

UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

SCIENCE

EYENZULULWAZI NGEZENDALO

NATUURWETENSKAPPE

BDE 214: Principles of Ecology

This course aims to expose students to the fundamental principles of ecology at various scales of organization, from individuals through ecosystems to the biosphere as a system. Topics covered include life-history strategies, competition, dispersal, predation, mutualism, population dynamics, community assembly, keystone species, diversity patterns and the processes structuring diversity, and elements of systems ecology. The theory will be supported with examples from local terrestrial and aquatic systems, in lectures but also through hands-on exposure during a group field project. The projects will provide students with the chance to get their hands dirty doing their own research. Students will be taught how to conduct scientific research, how to write effective scientific reports and how to analyze ecological data.

BDE 214: Beginsels van Ekologie

Hierdie kursus het ten doel om studente bloot te stel aan die fundamentele beginsels van ekologie op verskeie organisasieskale, van individue deur ekosisteme tot die biosfeer as 'n sisteem. Onderwerpe wat gedek word sluit in lewensgeskiedenisstrategieë, kompetisie, verspreiding, predasie, mutualisme, bevolkingsdinamika, gemeenskapssamestelling, sluitsteenspesies, diversiteitspatrone en die prosesse wat diversiteit struktureer, en elemente van sisteem-ekologie. Die teorie sal ondersteun word deur voorbeelde uit plaaslike terrestriële en akwatiese sisteme, in lesings maar ook deur praktiese blootstelling tydens 'n groep veldprojek. Die projekte sal studente die kans bied om hul hande vuil te maak om hul eie navorsing te doen. Studente sal geleer word hoe om wetenskaplike navorsing te doen, hoe om effektiewe wetenskaplike verslae te skryf en hoe om ekologiese data te ontleed.

Module summary

Name	BDE 214: Principles of Ecology
Duration	1st Semester
Academic commitment*	16 credits = 160 notional hours 6 hours contact time per week
Scheduled learning opportunities	3 lectures per week 1 practical per week
Assessment option	Option 4
Language option	Option 3
Mode of offering	Face-2-Face
Corequisites / Prerequisites / Pass prerequisites**	Prerequisite pass module: Biology 124 or 144 and a final mark of at least 40% for the other Biology module Corequisite module: BDE 212 or equivalent statistical module

***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.**

Outcomes

- Understanding fundamental principles of ecology at various scales of organization
- Ability to apply these principles to real-world problems in ecology
- Ability to conduct scientific research
- Ability to write effective scientific reports
- Analyze ecological data

Module-oorsig

Naam	BDE 214: Beginsels van Ekologie
Duur	1ste Semester
Akademiese verbintenis*	16 krediete = 160 veronderstelde ure 6 kontak ure per week
Geskeduleerde leergeleenthede	3 lesings per week 1 prakties elke week
Assesseringsopsie	Opsie 4
Taalopsie	Opsie 3
Modus van aanbieding	In persoon
Newevevereistes / Voorvereistes / Slaagvoorvereistes**	Slaagvoorvereiste module: Biologie 124 of 144 en 'n finale punt van minstens 40% vir die ander Biologie-module Voorvereiste module: BDE 212 of ekwivalente statistiese module

***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.**

Uitkomst

- Begrip van fundamentele beginsels van ekologie op verskeie organisasieskale
- Vermoë om hierdie beginsels toe te pas op werklike probleme in ekologie
- Vermoë om wetenskaplike navorsing te doen
- Vermoë om effektiewe wetenskaplike verslae te skryf
- Ekologiese data te ontleed

Scheduled learning opportunities

The official timetable indicating all scheduled learning opportunities and their allocated venues can be accessed via [My.SUN](#).

Lectures

This course takes place over a period of 13 weeks. Lectures will take place in lecture hall 2020 (the Broom) in the Natural Sciences Building during the lecture slots [Mondays (11h00-11h50), Wednesdays (10h00-10h50) and Fridays (08h00-08h50)].

Practicals

There are 13 practical sessions, which will either be held on Thursdays (14h00-16h50) in rooms 2020 + 2025 in the Natural Sciences Building, or these venues will be available for you to work on your projects. The practical component of the course is built around a group project. Students will be exposed to the process of designing a project, collecting and analysing data, and writing a scientific paper.

Field Trip

There will be a compulsory weekend field excursion to Soetwater (17 - 19 March), which forms part of the practical component of the course. We will leave from the front of the Natural Sciences Building at 17:00 on Friday 17 March and will return by 18:00 on Sunday 19 March. We will visit the Soetwater area, where we will study fynbos ecology and the nearby rocky and sandy shores will offer an opportunity to study inter-tidal ecology. You will need to bring: sleeping bag and pillow, torch, clothes for hot, cold and wet weather, secure shoes for working in dry and wet conditions (including slippery rocky shores), toiletries, medicines, sunblock, hat, clipboard, paper, pencil, eraser, plate, mug, fork, knife and spoon. If you have them, also bring: binoculars, cameras, identification guides and portable musical instruments. Food, tea, coffee and juices will be provided, however it is recommended that you bring extra snacks. If you have special dietary requirements, please inform us at least two weeks before the field trip so that suitable arrangements can be made.

Geskeduleerde leergeleenthede

Die amptelike rooster wat al die geskeduleerde leergeleenthede en die toegewysde lokale aandui, is beskikbaar by [My.SUN](#).

Lesings

Hierdie kursus vind plaas oor 'n tydperk van 13 weke. Lesings vind plaas in lesingsaal 2020 (die Broom) in die Natuurwetenskappegebou tydens die lesinggleuwe [Maandae (11h00-11h50), Woensdae (10h00-10h50) en Vrydae (08h00-08h50)].

Praktika

Daar is 13 praktiese sessies, wat óf op Donderdae (14h00-16h50) in kamers 2020 + 2025 in die Natuurwetenskappegebou gehou sal word, óf die lokale sal beskikbaar wees vir jou om aan jou projekte te werk. Die praktiese komponent van die kursus is gebou rondom 'n groepprojek. Studente sal blootgestel word aan die proses van ontwerp van 'n projek, die insameling en ontleding van data, en die skryf van 'n wetenskaplike artikel.

Veldekskursie

Daar sal 'n verpligte naweekvelduitstappie na Soetwater (17 - 19 Maart) wees wat deel vorm van die praktiese komponent van die kursus. Ons vertrek op Vrydag 17 Maart om 17:00 vanaf die voorkant van die Natuurwetenskappe-gebou en keer Sondag 19 Maart om 18:00 terug. Ons sal die Soetwater-area besoek, waar ons fynbosekologie sal bestudeer en die nabygeleë klipperige en sanderige kus sal 'n geleentheid bied om intergety-ekologie te bestudeer. Jy sal die volgende moet saambring: slaapsak en kussing, flits, klere vir warm, koue en nat weer, veilige skoene vir werk in droë en nat toestande (insluitend gladde klipperige kus), toiletware, medisyne, sonskerm, hoed, knipbord, papier, potlood, uitveër, bord, beker, vurk, mes en lepel. As jy dit het, bring ook: verkykers, kameras, identifikasiegidse en draagbare musiekinstrumente. Kos, tee, koffie en sappe sal voorsien word, maar dit word aanbeveel dat jy ekstra versnaperinge saambring. Indien u spesiale dieetvereistes het, laat weet ons asseblief ten minste twee weke voor die velduitstappie sodat geskikte reëlins getref kan word.

Study material

Recommended reading:

- Smith, T.M. & Smith, R.L. 2011. Elements of Ecology. 8th Edition. Pearson (This is the core text for the course)
- Begon, M. Townsend C. R., & Harper, J. L. 2006. Ecology: from individuals to ecosystems. 4th edition. Blackwell.
- Stiling, P. 2004. Ecology Theories and Applications. Prentice Hall.
- Levinton, Jeffrey S. 2009. Marine biology: function, biodiversity, ecology. New York: Oxford University Press
- Cowling, R.M. (ed.) 1992. The Ecology of Fynbos: Nutrients, Fire and Diversity. Cape Town: Oxford University Press.
- Aspects of the course are based on the current scientific literature. Selected research papers will be on SUNLearn

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/>

Studiemateriaal

Aanbevole leeswerk:

- Smith, T.M. & Smith, R.L. 2011. Elements of Ecology. 8th Edition. Pearson (This is the core text for the course)
- Begon, M. Townsend C. R., & Harper, J. L. 2006. Ecology: from individuals to ecosystems. 4th edition. Blackwell.
- Stiling, P. 2004. Ecology Theories and Applications. Prentice Hall.
- Levinton, Jeffrey S. 2009. Marine biology: function, biodiversity, ecology. New York: Oxford University Press
- Cowling, R.M. (ed.) 1992. The Ecology of Fynbos: Nutrients, Fire and Diversity. Cape Town: Oxford University Press.
- Aspects of the course are based on the current scientific literature. Selected research papers will be on SUNLearn

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/>

Lecturers

Course co-ordinator: Prof. Allan Ellis (Room 1092; e-mail: agellis@sun.ac.za)

Prof. Carol Simon (Room 2044, e-mail: cSimon@sun.ac.za)

Prof. Guy Midgley (Room 2039E; e-mail: gfmidgley@sun.ac.za)

Dr Heath Beckett (Room 1027; e-mail hbeckett@sun.ac.za)

Course assistant

Janette Hutton (Room 1006, e-mail: janette@sun.ac.za)

Dosente

Kursus koördineerder: Prof. Allan Ellis (Kamer 1092; e-mail: agellis@sun.ac.za)

Prof. Carol Simon (Kamer 2044, e-mail: cSimon@sun.ac.za)

Prof. Guy Midgley (Kamer 2039E; e-mail: gfmidgley@sun.ac.za)

Dr Heath Beckett (Kamer 1027; e-mail hbeckett@sun.ac.za)

Kursusassistent

Janette Hutton (Kamer 1006, e-mail: janette@sun.ac.za)

Assessment

This module follows assessment option 4. Please see the [Faculty of Science's assessment guidelines](#) for more details.

Method of assessment	Description	#	Allocated marks	Dates	Criteria
Project assignment	A research project (proposal and final project) to be completed during the semester	1	15%	Proposal – 9 March	All tests and assignments must be written and handed in to pass the module, AND a final mark of at least 50% must be obtained.
		5	25%	Final project – 11 May	
Class tests	An open book assignment and Two tests will be written during the semester in the class period	2	15%	Assignment – 13 March	
		3	15%	Test 1 – 31 March	
		4	15%	Test 2 – 28 April	
Final test	The final test will be written during the exam period	6	15%	10 June	

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

Calculation of final marks

Project proposal (15%)
 Project write-up (25%)
 Class test - individuals CS (15%)
 Class test - populations HB (15%)
 Class test - communities AGE (15%)
 Class test - ecosystems HB/GFM (15%)

Final mark100%

Assesserings

Hierdie module volg assesseringsopsie 4. Raadpleeg die [Fakulteit Natuurwetenskappe se assesseringsriglyne](#) vir meer besonderhede.

Metode van assessering	Beskrywing	#	Punte toegeken	Datums	Kriteria
Projek werkopdrag	'n Navorsingsprojek (voorstel en finale projek) wat gedurende die semester voltooi moet word	1	15%	Voorstel – 9 Maart	Alle toetse en werkopdragte moet geskryf en ingehandig word om die module te slaag, EN 'n finale punt van minstens 50% moet behaal word.
		5	25%	Finale Projek – 11 Mei	
Klastoetse	'n Oopboek werkopdrag en Twee toetse sal gedurende die semester in die klasperiode geskryf word	2	15%	Opdrag – 13 Maart	
		3	15%	Toets 1 – 31 Maart	
		4	15%	Toets 2 – 28 April	
Finaletoets	Die finale toets sal tydens die eksamenperiode geskryf word	6	15%	10 Junie	

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

Berekening van finale punte

Projekvoorstel (15%)
 Projek opskrywing (25%)
 Klastoets - individue CS (15%)
 Klastoets - populasies HB (15%)
 Klastoets - gemeenskappe AGE (15%)
 Klastoets-ekosisteme HB/GFM (15%)

Finale punt..... 100%

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 consult your lecturer immediately and provide the appropriate evidence as stipulated in the calendar.

Attendance of the fieldtrip is compulsory.

In instances where a deadline or practical is missed, an original doctor's certificate is required, within one week. If a practical is missed for medical reasons, the student still needs to complete the practical in their own time.

Reports must be handed-in to Janette in Room 1006 by 16:00 on the day of the deadline. Reports handed in late will have marks deducted at a rate of 5% per day. Practicals handed in a week, or more, late **will not** be marked.

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 die betrokke dosent onmiddellik kontak en die toepaslike bewys van rede tot afwesigheid inhandig, soos uiteengesit in die Jaarboek.

Bywoning van die veldekskursie is verpligtend.

In gevalle waar 'n sperdatum of prakties gemis word, word 'n oorspronklike doktersertifikaat binne een week vereis. Indien 'n prakties weens mediese redes gemis word, moet die student steeds die prakties in sy eie tyd voltooi.

Verslae moet teen 16:00 op die dag van die sperdatum by Janette in Kamer 1006 ingehandig word. Verslae wat laat ingehandig word, se punte word teen 'n koers van 5% per dag verminder. Praktika wat 'n week of meer laat ingehandig word, sal nie nagesien word nie.

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 the course assistant or relevant lecturers (emails listed above)

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** vir alle akademiese verwante kommunikasie te gebruik na aan die kursusassistent of relevante dosente (e-posse hierbo gelys)

Addressing challenges

For any complaints, the first port of call is the class representative, the course assistant or the relevant 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](#).

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.

Akademiese Wangedrag

Akademiese wangedrag sluit plagiaat samespanning, bedrog en versinsel in, soos bepaal in die [Dissiplinêre kode vir studente van die Universiteit Stellenbosch](#).

Plagiaat 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 plagiaat](#). Minder ernstige gevalle word deur die modulekoördineerder en betrokke departement hanteer soos uiteengesit in die fakulteitsprosedures.

Lecture programme:

Lecture	Date	Time	Subject / theme	Lecturer	NB
1	13-Feb	11:00			
2	15-Feb	10:00	INDIVIDUALS	CS	
3	17-Feb	08:00			
4	20-Feb	11:00			
5	22-Feb	10:00	INDIVIDUALS	CS	
6	24-Feb	08:00			
7	27-Feb	11:00			
8	01-Mar	10:00	INDIVIDUALS	CS	
9	03-Mar	08:00			
10	06-Mar	11:00			
11	08-Mar	10:00	INDIVIDUALS	CS	PROPOSAL HAND-IN (09-Mar, 16:00)
12	10-Mar	08:00			
13	13-Mar	11:00			ASSIGNMENT
14	15-Mar	10:00	POPULATIONS	HB	
15	17-Mar	08:00			
Field trip to Soetwater 17 – 19.03					
16	20-Mar	11:00			
17	22-Mar	10:00	POPULATIONS	HB	
18	24-Mar	08:00			
19	27-Mar	11:00			
20	29-Mar	10:00	POPULATIONS	HB	
21	31-Mar	08:00			CLASS TEST 1
University Recess – 03.04 – 10.04					
22	12-Apr	10:00	COMMUNITIES - diversity	AGE	
23	14-Apr	11:00			Monday timetable
24	17-Apr	11:00			
25	19-Apr	10:00	COMMUNITIES - assembly	AGE	
26	21-Apr	08:00			
27	24-Apr	11:00			
28	26-Apr	10:00	COMMUNITIES - function	AGE	

29	28-Apr	08:00			CLASS TEST 2
	01-May	11:00			
30	03-May	10:00	ECOSYSTEMS	GFM	PUBLIC HOLIDAY
31	05-May	08:00			
32	08-May	11:00			
33	10-May	10:00	ECOSYSTEMS	GFM	PROJECT HAND-IN (11-May, 16h00)
34	12-May	08:00			
35	15-May	11:00			
36	17-May	10:00	ECOSYSTEMS	GFM	
37	19-May	08:00			

Practical programme:

Date	Subject	Lecturer	Venue
16-Feb	Writing and reading in science / literature searching	CS	2020
23-Feb	Project orientation / Proposal preparation	CS/AGE/GFM/HB	2020/2025/1025
02-Mar	Proposal writing / experimental design	AGE	2020
09-Mar	Proposal hand in (by 16h00)		1006
16-Mar	No Practical		
17-19 Mar	Field Camp: Soetwater	CS/AGE/GFM/HB	
23-Mar	Data analysis		
30-Mar	Data analysis		
UNIVERSITY RECESS 03.04 – 10.04			
13-Apr	Data analysis guidance. Compulsory prac – it's important that you enter and explore the data beforehand (i.e., do preliminary analyses and graph the data!)	CS/AGE/GFM/HB	2020/2025/1025
20-Apr	Project write-up		
27-Apr	Project write-up		
04-May	Project write-up		
11-May	Project hand in (by 16h00)		1006
18-May	NO PRAC		

Lesingsprogram:

Lecture	Date	Time	Subject / theme	Lecturer	NB
1	13-Feb	11:00			
2	15-Feb	10:00	INDIVIDUE	CS	
3	17-Feb	08:00			
4	20-Feb	11:00			
5	22-Feb	10:00	INDIVIDUE	CS	
6	24-Feb	08:00			
7	27-Feb	11:00			
8	01-Mar	10:00	INDIVIDUE	CS	
9	03-Mar	08:00			
10	06-Mar	11:00			
11	08-Mar	10:00	INDIVIDUE	CS	VOORSTEL INHANDIGING((09- Mar, 16:00)
12	10-Mar	08:00			
13	13-Mar	11:00			OPDRAG
14	15-Mar	10:00	BEVOLKINGS	HB	
15	17-Mar	08:00			
Veldekskursie na Soetwater 17 – 19.03					
16	20-Mar	11:00			
17	22-Mar	10:00	BEVOLKINGS	HB	
18	24-Mar	08:00			
19	27-Mar	11:00			
20	29-Mar	10:00	BEVOLKINGS	HB	
21	31-Mar	08:00			KLASTOETS 1
Universiteitsvakansie – 03.04 – 10.04					
22	12-Apr	10:00	GEMEENSAPPE - diversiteit	AGE	
23	14-Apr	11:00			Maandagrooster
24	17-Apr	11:00			
25	19-Apr	10:00	GEMEENSAPPE - samekoms	AGE	
26	21-Apr	08:00			
27	24-Apr	11:00			

28	26-Apr	10:00	GEMEENSAPPE - funksie	AGE	
29	28-Apr	08:00			KLASTOETS 2
30	01-Mei	11:00			PUBLIEKEVAKANSIE DAG
31	03-Mei	10:00	EKOSISTEME	GFM	
32	05-Mei	08:00			
33	08-Mei	11:00			
34	10-Mei	10:00	EKOSISTEME	GFM	PROJEK INHANDIGING (11- Mei, 16h00)
35	12-Mei	08:00			
36	15-Mei	11:00			
37	17-Mei	10:00	EKOSISTEME	GFM	
	19-Mei	08:00			

Praktieseprogram:

Datum	Onderwerp	Dosent	Lokaal
16-Feb	Skryf en lees in wetenskap / literatuur soek	CS	2020
23-Feb	Projek oriëntasie / Voorstel voorbereiding	CS/AGE/GFM/HB	2020/2025/1025
02-Mar	Voorstelskryf / eksperimentele ontwerp	AGE	2020
09-Mar	Voorstel inhandig (teen 16h00)		1006
16-Mar	GEEN PRAKTIES		
17-19 Mar	Veldekskursie: Soetwater	CS/AGE/GFM/HB	
23-Mar	Data-analise		
30-Mar	Data-analise		
Universiteitsvakansie – 03.04 – 10.04			
13-Apr	Data-analise leiding. Verpligte prakties – dit is belangrik dat jy die data vooraf invul en verken (d.w.s. voortopige ontledings doen en grafeer die data)!	CS/AGE/GFM/HB	2020/2025/1025
20-Apr	Projek opskrywing		
27-Apr	Projek opskrywing		
04-May	Projek opskrywing		
11-May	Projek inhandig (teen 16h00)		1006
18-May	GEEN PRAKTIES		

