



Stellenbosch

UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

SCIENCE

EYENZULULWAZI NGEZENDALO

NATUURWETENSKAPPE

BDE (Biodiversity and Ecology)

344

Evolutionary Ecology

2023

BDE (Biodiversiteit & Ekologie) 344

Evolutionêre Ekologie

2023

Short description of the module

Topical themes in evolutionary ecology will be covered, namely the evolution of behaviour, biotic interactions and physiology. This module will deal with the following, as well as related, topics: game theory; optimal-foraging theory; life history evolution; evolution of sex; sexual selection and sex ratios; altruism and the evolution of sociality. Evolutionary arms races with mimicry and sexual conflict as examples; coevolution of plant animal interactions. The link between behaviour and physiology and physiological tolerances and constraints on survival, life histories and reproductive strategies. Appropriate field and statistical techniques used in evolutionary ecology research will be covered during practical sessions.

Kort beskrywing van die module

Aktuele temas in die evolutionêre ekologie, bv. die evolusie van gedrag, biotiese interaksies en fisiologie, word gedek. Hierdie module behandel onderstaande, sowel as verwante, temas: spelteorie; optimalevoedingsteorie; evolusie van die geskiedenis van lewe; evolusie van geslag; geslagseleksie en geslagsverhoudings; altruïsme en die evolusie van sosialiteit. Evolutionêre wapenwedlope met mimiek en geslagskonflik as voorbeelde; ko-evolusie van plant- en dierinteraksies. Die skakel tussen gedrag en fisiologie en fisiologiese toleransies en beperkings op oorlewing, lewensgeskiedenis en reprodktiewe strategieë. Toepaslike veld- en statistiese tegnieke binne die evolutionêre-ekologienavorsing word tydens praktika behandel

Module summary

Name	BDE344
Duration	2nd Semester
Academic commitment*	16 credits 6 contact hours per week
Scheduled learning opportunities	3 lectures per week 1 practical per week
Assessment option	Option 3
Language option	Option 1
Mode of offering	Face-2-Face
Corequisites / Prerequisites / Pass prerequisites**	Prerequisite pass modules: • Biodiversity and Ecology 212 or 214 and a final mark of at least 40% in the other Biodiversity and Ecology module Corequisite module: • Biodiversity and Ecology 244

**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	BDE 344
Duur	2de Semester
Akademiese verbintenisse*	16 krediete 6 kontakure per week
Geskeduleerde leergeleenthede	3 lesings per week 1 prakties per week
Assesseringsopsie	Opsie3
Taalopsie	Opsie 1
Modus van aanbieding	In persoon
Newevereistes / Voorvereistes / Slaagvoorvereistes**	Slaagvoorvereistemodules: • Biodiversiteit en Ekologie 212 of 214 met 'n finale punt van minstens 40% in die ander Biodiversiteit en Ekologie-module Newevereistemodule: • Biodiversiteit en Ekologie 244

**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.*

<p>Outcomes</p> <p>On completion of this module, students should:</p> <ul style="list-style-type: none"> • have a thorough knowledge of important concepts in evolutionary ecology • be aware of the most important research areas in evolutionary ecology • be able to think critically • be able to analyse data and interpret the results • be able to communicate science effectively 	<p>Uitkomst</p> <p>Na voltooiing van hierdie module moet studente:</p> <ul style="list-style-type: none"> • 'n deeglike kennis van belangrike konsepte in evolusionêre ekologie hê • bewus wees van die belangrikste navorsingsareas in evolusionêre ekologie • in staat wees om krities te dink • data kan analiseer en die resultate kan interpreter • wetenskap doeltreffend kan kommunikeer
<p>Scheduled learning opportunities</p> <p>The official timetable indicating all scheduled learning opportunities and their allocated venues can be accessed via My.SUN.</p> <p>Lectures</p> <p>3 Lectures per week: Mondays (11H10 – 12h00), Wednesdays (10H10 – 11h00), Fridays (8H10 – 9h00)</p> <p>Practicals</p> <p>All practical sessions and discussion/guest lectures are compulsory and may not be missed without excuse.</p>	<p>Geskeduleerde leergeleenthede</p> <p>Die amptelike rooster wat al die geskeduleerde leergeleenthede en die toegewysde venues aandui, is beskikbaar by My.SUN.</p> <p>Lesings</p> <p>3 Lesings per week: Maandae (11H10 – 12h00), Woensdae (10H10 – 11h00), Vrydae (8H10 – 9h00)</p> <p>Praktika</p> <p>Alle praktiese sessies en besprekings / gaslesings is verpligtend en mag nie gemis word sonder 'n verskoning nie.</p>
<p>Study material</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</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>

Lecturers

Course Co-ordinator: Prof. Theresa Wossler (TW)

email: wossler@sun.ac.za

Dr Monika Moir (MM) email: monikam@sun.ac.za

Mr. Frikkie Becker (FB) email: fwb@sun.ac.za

Course assistant

Ms Shula Johnson, shulaj@sun.ac.za, Room 2018, Natural Sciences Building.

Dosente

Kursuskoördineerder: Prof. Theresa Wossler (TW)

epos: wossler@sun.ac.za

Dr Monika Moir (MM) eposl: monikam@sun.ac.za

Mnr. Frikkie Becker (FB) epos: fwb@sun.ac.za

Kursus assistent

Me Shula Johnson, shulaj@sun.ac.za, Kamer 2018, NatWet gebou

Assessment

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

Assessment description	Date		Time	Lecturer	Weighting
Seminar series	Week 1 – Week 5		14h00 – 16h30	MM	16%
Test 1	Thursday 24 Aug		14h00 – 16h00	MM	17%
Plant mating write-up	Thursday 21 Sept		12h00	FB	17%
Test 2	Thursday 28 Sept		14h00-17h00	FB	16%
FameLab presentation	Thursday 26 Oct		16h00	TW	8%
Quest article	Monday 30 Oct		17h00	TW	10%
Test 3	Friday 17 Nov		14h00	TW	16%

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. Raadpleeg die [Fakulteit Natuurwetenskappe se assesseringsriglyne](#) vir meer besonderhede.

Assessment description	Date	Time	Lecturer	Weighting
Seminaarreeks	Week 1 – Week 5	14h00 – 16h30	MM	16%
Toets 1	Donderdag 24 Aug	14h00 – 16h00	MM	17%
Plant paring opskrif	Donderdag 21 Sept	12h00	FB	17%
Toets 2	Donderdag 28 Sept	14h00-17h00	FB	16%
FameLab voorlegging	Donderdag 26 Oct	16h00	TW	8%
Quest article	Monday 30 Oct	17h00	TW	10%
Toets 3	Vrydag 17 Nov	14h00	TW	16%

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

Calculation of final marks

A system of **Flexible Assessment** will be used. The *Final Mark* will be made up as follows:

Theory Test 1:	17%
Theory Test 2:	16%
Theory Test 3:	16%
Seminars:	16%
Data project write-up:	17%
Quest article	10%
FameLab presentation	8%
Grand total	100%

Take note: In modules where *Flexible Assessment* is used, there are NO supplementary examinations.

Berekening van finale punte

'n Stelsel van **Buigsame Assessering** sal gebruik word. Die Finale Punt sal soos volg saamgestel word:

Teorie toets 1:	17%
Teorie toets 2:	16%
Teorie toets 3:	16%
Seminare:	16%
Dataprojek-opskrywing:	17%
Soektog artikel	10%
FameLab voorlegging	8%
Groot totaal	100%

Let Wel: In modules waar *Buigsame Assessering* gebruik word, is daar GEEN hereksamens nie.

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.

All practical sessions and discussion/guest lectures are compulsory and may not be missed without excuse. In instances where a test or deadline is missed, a valid original doctor certificate is required within five working days after the test/deadline. In special circumstances (e.g. participation in provincial or national sporting events) a letter is required from the sporting body. In these instances, granting of permission to miss tests or deadlines is at the discretion of the course coordinator and is not automatic. If you are unable to make scheduled lectures, practicals or any of the deadlines you should contact Prof Theresa Wossler in advance to make alternative arrangements.

Documentation must be handed in to Ms Shula Johnson and a sick test (oral) will normally be held one week (five working days) after the original test date. It is the student's responsibility to determine the time and place of this test. No time extensions will be allowed for handing in practical reports and reports handed in late will not be marked (or a marks penalty will be applied).

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.

Alle praktiese sessies en bespreking/gaslesings is verpligtend en mag nie sonder verskoning gemis word nie. In gevalle waar 'n toets of sperdatum gemis word, word 'n geldige oorspronklike doktersertifikaat binne vyf werksdae na die toets/ sperdatum vereis. In spesiale omstandighede (bv. deelname aan provinsiale of nasionale sportbyeenkomste) word 'n brief van die sportliggaam vereis. In hierdie gevalle is die toekenning van toestemming om toetse of sperdatums mis te loop na goedgeskiedenis van die kursuskoördineerder en is dit nie outomaties nie. Indien u nie geskeduleerde lesings, praktiese of enige van die sperdatums kan maak nie, moet u Prof Theresa Wossler vooraf kontak om alternatiewe reëlins te tref.

Dokumentasie moet by me Shula Johnson ingehandig word. 'n Siekte toets ('n mondeling) sal normaalweg een week (vyf werksdae) na die oorspronklike toetsdatum gehou word. Dit is die student se verantwoordelikheid om die tyd en plek van hierdie toets te bepaal. Geen tyduitbreidings sal toegelaat word om praktiese verslae in te handig nie en verslae wat laat ingehandig word, sal nie gemerk word nie (of 'n punteboete sal toegepas word).

<p>Communication</p> <p>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.</p> <p>For communication with individual students, lecturers, support staff and peer-to-peer facilitators will only use students' official SUN email addresses.</p> <p>Students are also requested to use their official SUN email addresses for all academic related communication to: shulaj@sun.ac.za</p>	<p>Kommunikasie</p> <p>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.</p> <p>Vir kommunikasie met individuele studente, sal dosente, steunpersoneel en eweknie-fasiliteerders slegs studente se amptelike SUN-e-posadresse gebruik.</p> <p>Studente word ook versoek om hul amptelike SUN-e-posadresse vir alle akademiese verwante kommunikasie te gebruik: shulaj@sun.ac.za</p>
<p>Addressing challenges</p> <p>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.</p>	<p>Hantering van uitdagings</p> <p>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.</p>
<p>Academic Misconduct</p> <p>Academic misconduct includes plagiarism, collusion, cheating and fabrication as stipulated in the Disciplinary code for students of Stellenbosch University.</p> <p>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.</p>	<p>Akademiese Wangedrag</p> <p>Akademiese wangedrag sluit plagiaat samespanning, bedrog en versinsel in, soos bepaal in die Dissiplinêre kode vir studente van die Universiteit Stellenbosch.</p> <p>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.</p>

Lecture programme:

The lectures and accompanying material for each week will be available by 08h00 on the Monday morning.

Week (on SUNLearn)	Theme/Topic	Dates	Lecturer
1	Introduction where evolution and ecology meet; Phenotypic plasticity: climate change and breeding times; The comparative method in evolutionary ecology	24-28 July	MM
2	The comparative method in evolutionary ecology; Spatial memory; Social learning	31 July-4 Aug	MM
3	Social learning; Competing for resources	7-11 Aug	MM
4	Sexual selection, sperm competition and sexual conflict; Parental care and family conflicts	14-18 Aug	MM
5	Plant mating systems	21-25 Aug	FB
6	Species Interactions	28 Aug-1 Sept	FB
RECESS			

7	Species Interactions	18-22 Sept	FB
8	Species Interactions and Coevolution	25-29 Sept	FB
9	Eusociality continuum and evolution of helping / cooperative breeding	2-6 Okt	TW
10	Theories for the evolution of true sociality	9-13 Okt	TW
11	Reproductive Skew theory	16-20 Okt	TW
12	Reproductive conflict	23-27 Okt	TW

Lesingsprogram:

Die lesings en meegaande materiaal vir elke week sal die Maandagoggend teen 08h00 beskikbaar wees

Week (op SUNLearn)	Tema / Onderwerp	Datums	Dosent
1	Inleiding waar evolusie en ekologie ontmoet; Fenotipiese plastisiteit: klimaatsverandering en teeltye; Die vergelykende metode in evolusionêre ekologie	24-28 July	MM
2	Die vergelykende metode in evolusionêre	31 July-4 Aug	MM

	ekologie; Ruimtelike geheue; Sosiale leer		
3	Sosiale leer; Kompeteer vir hulpbronne	7-11 Aug	MM
4	Seksuele seleksie, spermkompetisie en seksuele konflik; Ouersorg en familie konflikte	14-18 Aug	MM
5	Plant paring stelsels	21-25 Aug	FB
6	Spesies Interaksies	28 Aug-1 Sept	FB
RESES			
7	Spesies Interaksies	18-22 Sept	FB
8	Spesie interaksies & Ko-evolusie	25-29 Sept	FB
9	Eussosialiteitskontinuum en evolusie van hulp / koöperatiewe teling	2-6 Okt	TW
10	Teorieë vir die evolusie van ware sosialisme	9-13 Okt	TW
11	Reproduktiewe Skewe teorie	16-20 Okt	TW
12	Voortplantingskonflik	23-27 Okt	TW

Practicals:

Practicals are scheduled for Thursdays, Lab 2025, Natural Science Building: 14H00-17H00.

Weeks	Date / Time	Subject	Lecturer
1	Thursday 27 July	Phenotypic plasticity: climate change and breeding times	MM
2	Thursday 3 Aug	Spatial memory	MM
3	Thursday 10 Aug	Competing for resources	MM
4	Thursday 17 Aug	Parental care and family conflicts	MM
5	Thursday 24 Aug	Test 1	MM
6	Thursday 31 Aug	R introduction and Data collection	FB
RECESS			
8	21 Sept	Data entry and Processing	FB
9	Thursday 28 Sept	Test 2	FB
10	Thursday 5 Oct	Introduce project	TW
11	Thursday 12 Oct	Data Collection	TW
12	Thursday 19 Oct	Data Collection	TW
13	Thursday 26 Oct	Famelab presentations	TW

Praktiese:

Praktiese is geskeduleer vir Donderdae, Lab 2025, Natuurwetenskap gebou:
14H00-17H00

Cali	Datum / Tyd	Onderwerp	Dosent
1	Donderdag 27 Julie	Fenotipiese plastisiteit: klimaatsverandering en teeltye	MM
2	Donderdag 3 Aug	Ruimtelike geheue	MM
3	Donderdag 10 Aug	Kompeteer vir hulpbronne	MM
4	Donderdag 17 Aug	Ouersorg en familie konflikte	MM
5	Donderdag 24 Aug	Toets 1	MM
6	Donderdag 31 Aug	Inleiding tot R en Data versameling	FB
RESES			
8	Donderdag 21 Sept	Invoering van data en prossseseering	FB
9	Donderdag 28 Sept	Toets 2	FB
10	Donderdag 5 Okt	Voorstel van projek	TW
11	Donderdag 12 Okt	Data Insameling	TW
12	Donderdag 19 Nov	Data Insameling	TW
13	Donderdag 26 Okt	Famelab Aanbiedings	TW