



Stellenbosch

UNIVERSITY
IYUNIVESITHI
UNIVERSITEIT

SCIENCE

EYENZULULWAZI NGEZENDALO

NATUURWETENSKAPPE

BDE 324 Angiosperm diversity and evolution

Short description of the module

The aims of this module are firstly to introduce students to the origin, diversity and phylogenetic relationships among the angiosperms. As sub-theme those disciplines and their specific traits that are of phylogenetic importance in the reconstruction of angiosperm evolution will be considered in more detail. These include molecular traits, palynology, morphology, anatomy, embryology and karyology. Finally, chemical diversity among angiosperms will be explored.

BDE 324 Angiospermdiversiteit en -evolusie

Kort beskrywing van die module

Die doelwitte van hierdie kursus is eersens om studente bekend te stel aan die oorsprong, diversiteit en filogenetiese verwantskappe tussen die angiosperme. As subtema sal die dissiplines wat filogeneties belangrik is in die rekonstruksie angiosperm evolusie, en hulle spesifieke in meer detail bespreek word. Hierdie kenmerke sluit molekulêre kenmerke, palinologie, morfologie, anatomie, embriologie en kariologie in. Laastens sal die chemiese diversiteit binne die angiosperme bespreek word.

Module summary

Name	BDE324
Duration	1st semester
Academic commitment*	16 credits = 160 notional hours 6 contact hours 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 modules: - any two of the following three modules: • Biology 124,144,154

**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 324
Duur	1 ^{ste} semester
Akademiese verbintenis*	16 krediete = 120 veronderstelde ure 6 kontakure per week
Geskeduleerde leergeleenthede	3 lesings per week 1 prakties per week
Assesseringsopsie	Opsie 4
Taalopsie	Opsie 3
Modus van aanbieding	In persoon
Nowereistes / Voorvereistes / Slaagvoorvereistes**	Slaagvoorvereiste modules: - enige twee van die volgende drie modules: • Biologie 124 144 154

**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 course you should:

- have a good overview of the main evolutionary developments in the angiosperms
- have a sound knowledge of the traits from diverse disciplines that are significant in reconstructing relationships among angiosperms
- be able to interpret and describe the morphological diversity within the angiosperms, at least at the family level
- be able to think and communicate laterally and critically about the angiosperms

Uitkomst

Na voltooiing van hierdie kursus behoort jy:

- 'n goeie oorsig oor die hoof evolusionêre ontwikkelings binne die angiosperme te hê
- 'n sterk basiese kennis te hê van die kenmerke van diverse disciplines wat belangrik is in die rekonstruksie van verwantskappe binne die angiosperme of
- In staat te wees om morfologiese diversiteit binne die angiosperme te interpreter en beskryf, ten minste op die familie-vlak
- In staat wees om lateral en krities te kan dink en kommunikeer oor die angiosperme

Scheduled learning opportunities

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

Lectures

All lectures will be presented as live Powerpoint presentations, and these slides (non-narrated) will be made available on SunLearn for study purposes.

Practicals

All practicals are compulsory, and there will be a practical examination based on the Angiosperm diversity practical series. Please bring a dissecting kit to these practicals (available at Neelsie Stelkor Pharmacy), as we will be dissecting flowers.

Geskeduleerde leergeleentede

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

Lesings

Alle lesings sal as in persoon Powerpoint voordragte aangebied word, en hierdie notas (sonder stemopnames) sal op SunLearn beskikbaar gestel word vir studie doeleindes.

Praktika

Alle praktika is verpligtend, en daar sal 'n praktiese eksamen wees gebaseer op die Angiosperm diversiteit praktiese reeks. Bring asseblief 'n dissekteerstel na hierdie praktika (verkrygbaar by Neelsie Stelkor Apteek), aangesien ons blomme gaan dissekteer.

Study material

Plant Systematics: a phylogenetic approach. Judd, WS, Cambell, CS, Kellogg, EA, Stevens, PF. and Donoghue, MJ. 2002. Plant Systematics. Additional research papers will be provided 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

Plant Systematics: a phylogenetic approach. Judd, WS, Cambell, CS, Kellogg, EA, Stevens, PF. en Donoghue, MJ. 2002. Plant Systematics. Addisionele navorsingsartikels sal op SunLearn beskikbaar gestel word.

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

Prof. L.L. Dreyer (LLD) - course coordinator; ld@sun.ac.za
 Prof. A.G. Ellis (AGE) - agellis@sun.ac.za
 Ms Zaynab Shaik (ZS) - zshaik@sun.ac.za
 Prof. N. Makunga (NPM) - makunga@sun.ac.za

Course assistant

Mrs. Janette Hutton (JH) - janette@sun.ac.za

Dosente

Prof. L.L. Dreyer (LLD) - kursuskoördineerder; ld@sun.ac.za
 Prof. A.G. Ellis (AGE) - agellis@sun.ac.za
 Me. Zaynab Shaik (ZS) - zshaik@sun.ac.za
 Prof. N. Makunga (NPM) - makunga@sun.ac.za

Kursus assistent

Mev. Janette Hutton (JH) - janette@sun.ac.za

Assessment

The dates for all centrally scheduled assessments are published on [My.SUN](#).

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
Assignment	Species assignment	1	25%	03 May 2024 13h00	All tests and assignments must be written and handed in to pass the module, AND an average mark of 50% must be obtained.
A1 assessment	Semester test on work covered in lectures by ZS and AGE	2	25%	19 March 2024	
Practical test	Practical test based on work covered in the Angiosperm diversity practical series	3	25%	30 April 2024	
A2 assessment	Test based on work covered in lectures by LLD and NPM	4	25%	20 May 2024 14h00	

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

Calculation of final marks

Assignment	25%
A1 Class test:	25%
Practical Test	25%
A2 exam test	25%

Final mark	100%

Assesserings

Die datums van alle sentraal geskeduleerde assesserings word op [My.SUN](#) gepubliseer.

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

Metode van assessering	Beskrywing	#	Punte toegeken	Datums	Kriteria
Werkopdrag	Spesie werkopdrag	1	25%	03 Mei 2024 13h00	Alle toetse en werksopdragte moet geskryf en ingehandig word om hierdie module te slaag, EN 'n gemiddelde punt van 50% moet behaal word
A1 assessering	Semestertoets oor werk behandel in lesings deur ZS en AGE		25%	19 Maart 2024	
Praktiese toets	Praktiese toets gebaseer op werk wat tydens die Angiosperm diversiteit praktiese reeks bespreek sal word.	3	25%	30 April 2024	
A2 assessering	Toets gebaseer op werk wat deur LLD en NPM behandel	4	25%	20 Mei 2024 14h00	

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

Berekening van finale punte

Werkopdrag	25%
A1 Klastoets:	25%
Praktiese toets	25%
A2 eksamentoets	25%

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.

In the event of missing a test or important deadline, a valid, original medical certificate must be handed to Mrs. Janette Hutton within 5 days after the test of the assignment hand-in date. A replacement oral test will be scheduled within one week (7 days) after the original test date. It is the responsibility of the student to establish the time and place of this oral. No postponement will be granted for the hand in of assignments or practical reports, and a penalty of 5% per day will be subtracted from all such assignments.

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 'n toets of belangrike sperdatum mis, moet 'n geldige, oorspronklike mediese sertifikaat aan Mev. Janette Hutton gegee word binne 5 dae na die toets of die werksopdrag inhandigingsdatum. 'n Vervangings mondelinge toets sal geskeduleer word binne een week (7dae) na die oorspronklike toetsdatum. Dit is die verantwoordelikheid van die student om vas te stel waar en wanneer die mondeling sal plaasvind. Geen uitstel sal verleen word vir die inhandiging van werksopdragte of praktiese verslae nie, en 'n straf van 5% per dag sal afgetrek word van al sulke werksopdragte.

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: ld@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** vir alle akademiese verwante kommunikasie te gebruik: ld@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.

Akademiese Wangedrag

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

Die [US Plagiaatbeleid](#) definieer plagiaat as: "Die gebruik van ander se idees of materiaal [insluitend KI generatiewe instrumente, soos ChatGPT of Bing] sonder [toepaslike] erkenning, of die hergebruik van 'n persoon se eie voorheen geëvalueerde werk of gepubliseerde materiaal sonder erkenning (selfplagiaat)." Sodanige erkenning sal insluit die verwysing na die bron van voorheen uitgedrukte idees of gepubliseerde materiaal, of die erkenning van die bydrae van bv. die KI-instrument, soos gestipuleer vir 'n spesifieke assessering of opdrag.

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 times:

- Monday (08h10 – 09h00)
- Wednesdays (09h10 – 10h00)
- Thursdays (12h10 – 13h00)

Venue: Natural Science Building, Room 3004.

Week	Date	Lecturer	Theme
1	12/2	ZS	Angiosperm origin and classification
1	14/2	ZS	Angiosperm origin and classification
1	15/2	ZS	Angiosperm origin and classification
2	19/2	ZS	Molecular systematics
2	21/2	ZS	Molecular systematics
2	22/2	ZS	Molecular systematics
3	26/2	ZS	Angiosperm diversification
3	28/2	ZS	Angiosperm diversification
3	29/2	ZS	Angiosperm diversification
4	04/3	AGE	Angiosperm diversification
4	06/3	AGE	Angiosperm diversification
4	07/3	AGE	Angiosperm diversification
5	11/3	AGE	Angiosperm reproductive innovations
5	13/3	AGE	Angiosperm reproductive innovations
5	14/3	AGE	Angiosperm reproductive innovations
6	18/3	AGE	Angiosperm reproductive innovations

6	20/3	AGE	Angiosperm reproductive innovations
	21/3		PUBLIC HOLIDAY
7	25/3	AGE	Angiosperm reproductive innovations
7	27/3	LLD	Introduction to systematics
7	28/3	LLD	Introduction to systematics
University Recess 02.04 – 05.04			
8	08/4	LLD	Palynology
8	10/4	LLD	Palynology
8	11/4	LLD	Palynology
9	15/4	LLD	Vegetative morphology
9	17/4	LLD	Vegetative morphology
9	18/4	LLD	Reproductive morphology
10	22/4	LLD	Reproductive morphology
10	24/4	LLD	Karyology
10	25/4	LLD	Karyology
11	29/04	LLD	Anatomy
11	01/5		PUBLIC HOLIDAY
11	02/5	LLD	Anatomy
12	06/5	NPM	Chemical diversity
12	08/5	NPM	Chemical diversity
12	09/5	NPM	Chemical diversity
13	13/5	NPM	Chemical diversity
13	15/5	NPM	Chemical diversity
13	16/5	NPM	Chemical diversity

Practical programme: The course includes 13 practical sessions, and attendance of all of these practicals is COMPULSORY. Official practical sessions are on Tuesday afternoons (14h10-17h00) in the Natural Science building (laboratory 2025). The practical sessions will comprise of the following:

Week	Date	Lecturer	Theme
1	13/2	LLD	Introduction
2	20/2	LLD	Botanical drawing
3	27/2	LLD	Angio 1
4	05/3	LLD	Angio 2
5	12/3	AGE	Angio 3
6	19/3	AGE	Angio 4
7	26/3	ZS	Angio 5
8	09/4	LLD	Angio 6
9	16/4	LLD	Angio 7
10	23/4	ZS	Angio 8
11	30/4	LLD & ZS	Prac exam
12	07/5	NPM	Medicinal plants and chemical diversity
13	14/5	NPM	Exploitation of chemical diversity in industry

Lesingsprogram:

Lesingtye:

- Maandag (08h10 – 09h00)
- Woensdag (09h10 – 10h00)
- Donderdag (12h10 – 13h00)

Lokaal: Natuurwetenskappe gebou, Kamer 3004.

Week	Datum	Dosent	Tema
1	12/2	ZS	Angiosperm oorsprong en klassifikasie
1	14/2	ZS	Angiosperm oorsprong en klassifikasie
1	15/2	ZS	Angiosperm oorsprong en klassifikasie
2	19/2	ZS	Molekulêre sistematiek
2	21/2	ZS	Molekulêre sistematiek
2	22/2	ZS	Molekulêre sistematiek
3	26/2	ZS	Angiosperm diversifikasie
3	28/2	ZS	Angiosperm diversifikasie
3	29/2	ZS	Angiosperm diversifikasie
4	04/3	AGE	Angiosperm diversifikasie
4	06/3	AGE	Angiosperm diversifikasie
4	07/3	AGE	Angiosperm diversifikasie
5	11/3	AGE	Angiosperm reprodktiewe innovasies
5	13/3	AGE	Angiosperm reprodktiewe innovasies
5	14/3	AGE	Angiosperm reprodktiewe innovasies
6	18/3	AGE	Angiosperm reprodktiewe innovasies

6	20/3	AGE	Angiosperm reprodktiewe innovasies
	21/3		PUBLIEKEVAKANSIEDAG
7	25/3	LLD	Angiosperm reprodktiewe innovasies
7	27/3	LLD	Inleiding tot sistematiek
7	28/3	LLD	Inleiding tot sistematiek
Universiteitsvakansie 02/4 – 05/4			
8	08/4	LLD	Palynologie
8	10/4	LLD	Palynologie
8	11/4	LLD	Palynologie
9	15/4	LLD	Vegetatiewe morfologie
9	17/4	LLD	Vegetatiewe morfologie
9	18/4	LLD	Reprodktiewe morfologie
10	22/4	LLD	Reprodktiewe morfologie
10	24/4	LLD	Kariologie
10	25/4	LLD	Kariologie
11	29/4	NPM	Anatomie
	01/5		PUBLIEKEVAKANSIEDAG
11	02/5	NPM	Anatomie
12	06/5	NPM	Chemiese diversiteit
12	08/5	NPM	Chemiese diversiteit
12	09/5	NPM	Chemiese diversiteit
13	13/5	NPM	Chemiese diversiteit
13	15/5	NPM	Chemiese diversiteit
13	16/5	NPM	Chemiese diversiteit

Praktiese program: Die kursus sluit 13 praktiese sessies in, en bywoning van al hierdie praktika is VERPLIGTEND. Amptelike praktiese sessies is op Dinsdag middag (14h10-17h00) in die Natuurwetenskappe gebou (laboratorium 2025). Die praktiese sessies sal handel oor:

Week	Datum	Dosent	Tema
1	13/2	LLD	Inleiding
2	20/2	LLD	Botaniese tekening
3	27/02	LLD	Angio 1
4	05/3	LLD	Angio 2
5	12/3	LLD	Angio 3
6	19/3	LLD	Angio 4
7	26/3	ZS	Angio 5
8	09/4	LLD	Angio 6
9	16/4	LLD	Angio 7
10	23/4	ZS	Angio 8
11	30/4	LLD & ZS	Praktiese eksamen
12	07/5	NPM	Medisinale plante en chemiese diversiteit
13	14/5	NPM	Benutting van chemiese diversiteit in die industrie