

BDE 345 Invasion Biology

Second semester 2022

16 credits

Course co-ordinator: Prof. Tammy Robinson

Lecturers:

Prof. Tammy Robinson (TBR)
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Dr Nicole Martin (NM)
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Dr Sabrina Kumschick (SK)
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Dr Nicola van Wilgen (NVW)
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Course Assistant:

Mrs Janette Hutton
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Pre-requisites:

Any four of the following modules: BDE 212, 214, 224, 244, 254, 264

Aims:

This course aims to introduce students to invasion biology. It covers a variety of topics concerned with alien species including the processes governing their success, the impacts they have and the management of invasions.

On completion of this module you should be familiar with the following concepts:

- What are invaders and why should we care about them?
- Terminology used in invasion ecology
- Pathways and vectors of alien species
- Propagule pressure
- The genetics of invasions
- Spatial and temporal trends in invasions
- Disturbance and invasions
- Dispersal and spread
- Establishment success
- Ecological processes and the spread of invasive species
- Impacts of alien species
- Risk assessment in an invasion context
- Management approaches

Textbook:

Van Wilgen et al (2020) Biological invasions in South Africa. See link to free online version on SUNLearn.

Lockwood et al (2013) Invasion ecology. Blackwell Publishing, Oxford. This book is **NOT required** but you **may find it helpful**.

Scientific literature: Published papers are an important resource in this course. These will be posted on a SunLearn.

This module will be offered on campus with no simultaneous live streaming

Course structure: Lectures will be held on Mondays (09h00 – 09h50), Wednesday (12h00 – 12h50) and Thursday (08h00 – 08h50) in the JC Smuts A201

Term 3				Term 4			
Week	Time	Topic	Lecturer	Week	Time	Topic	Lecturer
18 - 22 Jul	Mon 09:00	Introduction	TBR	12 - 16 Sep	Mon 09:00	Invasions in the marine environment	TBR
	Wed 12:00	Invasion Science - History, terminology, concepts			Wed 12:00	Guest lecture: Dr Luke Potgieter	
	Thurs 08:00	Understanding dispersal			Thurs 08:00	The status of marine invasion science in SA	
25 - 29 Jul	Mon 09:00	Vectors & pathways	TBR	19 - 23 Sep	Mon 09:00	Invasions in protected areas	TBR
	Wed 12:00	Propagule pressure & population growth I			Wed 12:00	Genetic applications in an invasion context	
	Thurs 08:00	Propagule pressure & population growth I			Thurs 08:00	Crypticity in invasions	
1 - 5 Aug	Mon 09:00	Geographic patterns	NM	26 - 30 Sep	Mon 09:00	The need for an interdisciplinary approach	TBR
	Wed 12:00	Major hypotheses in invasion ecology I			Wed 12:00	Guest lecture: DFFE	
	Thurs 08:00	Major hypotheses in invasion ecology II			Thurs 08:00	Integrating research & management	
8 - 12 Aug	Mon 09:00	Disturbance	NM	3 - 7 Oct	Mon 09:00	Prevention, early detection & eradication (SK)	SK/ NVW
	Wed 12:00	Resistance I			Wed 12:00	The alien species management toolbox (NVW)	
	Thurs 08:00	Resistance II			Thurs 08:00	Large scale alien clearing programmes (NVW)	
15 - 19 Aug	Mon 09:00	Facilitation	NM	10 - 14 Oct	Mon 09:00	Risk analysis (SK)	SK/ NVW
	Wed 12:00	Climate change & Invasions I			Wed 12:00	Interactions between climate change & management (NVW)	
	Thurs 08:00	Climate change & Invasions II			Thurs 08:00	Impact Assessment (SK)	
22 - 26 Aug	Mon 09:00	Types of impacts	TBR	17 - 21 Oct	Mon 09:00	Conflicts of interest in managing alien invasive species (SK)	SK/ NVW
	Wed 12:00	Measuring impacts			Wed 12:00	Management of aliens in TMNP (NVW)	
	Thurs 08:00	Impacts case study			Thurs 08:00	Self-study	
29 Aug - 2 Sep	Mon 09:00	Species traits & Invasiveness	TBR				
	Wed 12:00	Guest lecture: Dr Emily McCulloch-Jones					
	Thurs 08:00	Self-study					
University Recess: 5 – 9 Sep							

Practical programme:

The practical component of this course will take the form of various assignments that will be submitted online. Pracs are scheduled for Friday afternoons 14h00-17h00 in room 1030 of the Natural Sciences Building.

Date	Time	Topic	Venue	Lecturer
22 Jul	14h00	Introduction to the management report	1030	TBR
29 Jul	14h00	No formal prac. Work on management report	N/A	
5 Aug	14h00	No formal prac. Work on management report	N/A	
12 Aug	14h00	No formal prac. Work on management report	N/A	
19 Aug	14h00	No formal prac. Work on management report	N/A	
26 Aug	14h00	Class Test	1030	TBR
02 Sep	14h00	No formal prac. Submit management report by 17h00	N/A	
Vac				
16 Sep	14h00	No formal prac.	N/A	
23 Sep	14h00	Management report presentations Session 1	1030	TBR
30 Sep	14h00	Management report presentations Session 2	1030	TBR
7 Oct	14h00	No formal prac. Submit field trip report by 17h00	N/A	
14 Oct	14h00	No formal prac.	N/A	
21 Oct	14h00	Q&A session re final test	1030	TBR

Assessments:

This course is a flexible assessment module. The final mark will be calculated as follows:

Class test:	25%
Field trip report:	15%
Management report:	20%
Textbook box:	5%
Final Test:	<u>35%</u>
	100%

Note: To pass this course you require a subminimum of 45% average for the tests and a final mark of at least 50%. **No exceptions will be made.**

Important dates:

Date	Deliverable	Venue / Submission platform
10 Aug	Textbook box	SunLearn
26 Aug	Class test (during prac)	1030
02 Sept	Management report	SunLearn by 17h00
17 Sept	Field trip	False Bay
23 Sept	Management report presentations Session 1	1030
30 Sept	Management report presentations Session 2	1030
7 Oct	Field trip report	SunLearn
8 Nov	Final test	TBC

Important information:

Use of university emails and SUNLearn Settings:

All communication for this course will be posted via SUNLearn or directly to your official university email address. You will need to use a link sent to this email address to access the online meetings via Teams. If you routinely use another email address, please be sure to auto-forward your university email to that address. Please note that we will routinely be communicating through SUNLearn. Should you choose to alter your settings so that you don't get messages as soon as they are sent, you may miss urgent messages.

Missing tests and deadlines:

In instances where a test or deadline is missed a valid doctor's certificate is required within one week of the test or hand-in date. The certificate must be emailed to Mrs Hutton (email: janette@sun.ac.za). We reserve the right to request a hardcopy of the certificate. Failure to submit a note will result in a mark of zero. Should you be required to self-quarantine please let the lecturer know asap. This enables us to provide the support that you need to keep on top of your studies.

Late submissions:

Assignments received after the deadline will lose 5% per day and will not be marked if submitted later than seven days.

Submission deadlines:

All assessments have been carefully scheduled to avoid clashes with other third year BDE courses. As such no deadlines will be moved.

Subminimum:

To pass this course you require a subminimum of 45% average for the tests and a final mark of at least 50%.

Language implementation for this module:

The Department of Botany and Zoology recognises English as the international academic language and a medium through which science can be communicated. It is thus our endeavour to ensure that each and every one of our students are proficient in communicating through the medium of English. We will, however, accommodate our Afrikaans students to the best of our ability.

The following language option will be implemented in this BDE module: Lectures will be offered in English only

The materials for learning will be made available as follows:

- All compulsory reading material will be provided in English. Compulsory reading material (excluding published material) will also be provided in Afrikaans unless it is not reasonably practicable to do so.
- Module frameworks/study guides will be available in Afrikaans and English.
- Question papers for tests, examinations and other summative assessments will be available in Afrikaans and English. Students may answer all assessments and submit all written work in either Afrikaans or English.