

Department of



Conservation Ecology & Entomology

Guide for Undergraduate Students

2018

Department of Conservation Ecology &
Entomology
Stellenbosch University
Private Bag X1 • MATIELAND 7602
Tel/Fax: (021) 808 3304



TABLE OF CONTENTS

1. Whom to see, useful web pages, contacting staff and students	4
2. Departmental mission statement	
3. Programme descriptions	4
4. Module descriptions	5
Nematology 344	5
Insect pest management 314	6
Insect conservation ecology 464	7
Insect diversity 418	8
Applied insect ecology 454	9
Conserving nature 212	9
Conservation censusing 244	11
Biome ecology 314	12
Introduction to conservation management 344	12
Nature conservation management 414	13
Conservation plan 448	14
Conservation case studies and wildlife management 424	15
5. Getting started	17
Academic entry requirements	17
Application	17
Information for foreign students	17
Registration	18
Student identification card	18
6. Getting to know the department & future options	18
Getting on to the ConsEnt list	18
Annual research day	18
Attending departmental seminars and meetings	18
7. Things you should know	18
Improving your writing skills	18
SU writing laboratory	21
Code of conduct for language in the classroom	21
Improving your statistical skills	23
Plagiarism	24
8. General information	25
Photocopying	25
Computer user areas	25
General messages related to undergraduate students	25
Vehicles	25
Using departmental facilities	25
Storerooms	25
9. Occupational health and safety	25
University safety policy	25
Personal safety and security	25
Departmental safety	26
Building security	26
Protective clothing and equipment	26

Material safety data sheets (MSDS).....	27
Laboratory safety.....	27
Safe waste disposal.....	28
Appendix 1: Staff contact details.....	29
Appendix 2: Conservation Ecology course details (2012).....	30
Appendix 2: Rules for the use of US fleet vehicles.....	31
Appendix 3: Departmental facilities and assigned staff.....	32

EDIT PAGE NUMBERS!

1. Who's who?

			Tel. Ext.	Room
Chair of Department	Prof. Karen Esler	kje@sun.ac.za	4005	3011
Deputy Chair of Department	Prof. John Terblanche	jst@sun.ac.za	9225	2034
Undergraduate coordinator	Dr Alison Leslie	aleslie@sun.ac.za	2487	3016b
Postgraduate coordinator	Dr James Pryke	jpryke@sun.ac.za	9222	3047
Research coordinator	Dr John Terblanche	jst@sun.ac.za	4774	2034
Departmental Secretaries	Ms Monean Wenn	mwenn@sun.ac.za	3304	3010
	Ms Colleen Louw	collouw@sun.ac.za	4775	2007
Departmental Safety Officers	Ms Celeste Mockey	cmockey@sun.ac.za	4529	3004
Student Councilor	Mr Riaan Keown	riaank@sun.ac.za	4779	2040
	Dr Alison Leslie	aleslie@sun.ac.za	2487	3016b

Useful web pages for prospective students

Departmental home pages: <http://www.sun.ac.za/english/faculty/agri/conservation-ecology>

Centre for student communities:

http://www0.sun.ac.za/ssq/index.php?option=com_content&view=article&id=24:test&catid=90&Itemid=1070&lang=en

Information on application procedure: <http://www.sun.ac.za/english/maties/Pages/default.aspx>

Research groups

There are a number of research groups within the department. For more information on these groups and their research interests please see the departmental web site.

Contacting other staff and students

A list of staff and students can be found at the respective departmental web pages. These will have e-mail addresses and phone numbers or alternatively see Appendix 1 of this guide. To find other University staff members, use the online search function: <http://qids.sun.ac.za>

2. Department of Conservation Ecology & Entomology: vision and mission

Our vision: To be a world centre of excellence for teaching, research and technology transfer in the field of conservation of natural resources.

Our mission: To undertake teaching, research and technology transfer in ecology, conservation and management of utilized landscapes and their surrounds. This involves seven thrusts :

- Conservation Planning and Management in Agricultural Landscapes
- Restoration Ecology and Landscape Ecology
- Conservation of Symbioses
- Vertebrate Conservation
- Invertebrate Conservation
- Area-wide Pest Management on Tree Crops
- Applied Physiological Ecology

3. The Conservation Ecology Teaching Programme

Note that this programme is fully managed from within the Department of Conservation Ecology & Entomology; Entomology modules not included in this programme (listed under item 4), are presented as part of the Crop Production Systems programme.

Programme motivation: Conservation ecologists are many things. Some work with non-governmental organizations to encourage farmers or miners to run their businesses in a more sustainable manner, others repair damage, some assess potential impacts of land use, others predict outcomes of climate change or alien invasion. Some work with economists to develop total environmental accounting whereas others measure plant or animal population health and model sustainable off take. Some will be involved in policy development, others in conservation planning. All are concerned with mitigating the effects of people on the environment, promoting sustainable use of the world's resources, and limiting extinctions. Some will have people-orientated careers, and others plant or animal orientated. All need an excellent understanding of ecological processes, economics, and human behavior. However, conservation ecologists are generally not wildlife biologists, vets, environmental lawyers or taxonomists. For this reason, a range of modules are presented that essentially provide our undergraduate students with an essential “tool-kit” on basic and applied knowledge to address a career in Conservation Ecology.

Graduate profile: Our vision is that graduates of the Conservation Ecology Programme will:

Contribute to the sustainable management of agricultural landscapes at all spatial scales (global, continental, national, local). They will have the skills to be professionally mobile. They will be aware of issues in the “real world” and be able to inform policy & management at the multiple scales. They will possess a strong professional tool-kit (academically sound knowledge and skills) that enables them to:

- Be technologically and analytically proficient
- Be socially embedded and interactive
- Be broad-minded, critical & innovative thinkers
- Be able to transfer theory into practice
- Be facilitators of positive change in research and management
- Be able to think globally, but act locally;
- Be transdisciplinary, holistic / systems thinkers
- Be able to network & able to work in teams
- Be socially and culturally sensitive & responsive
- Be decision makers towards positive action for a better, environmentally aware world

- Be flexible and creative

Our graduates will have well developed generic skills (reading, writing, quantitative skills); they will be inspired, confident, and articulate.

Course content: The undergraduate course lasts four years. The first year follows the Programme in Biological Sciences in the Faculty of Science, taking modules in biology, chemistry, geo-environmental science, computer skills and mathematics. From the second year onwards, the programme continues in the Faculty of AgriSciences, studying subjects dealing with conservation ecology, biodiversity and applied sciences, such as microbiology, GIS and computer skills. The third year continues with conservation ecology, biodiversity and ecology, and courses in biometry, industrial psychology, environmental sociology, soil science and genetics. In the fourth year, skills gained in the first three years are integrated to focus on the big and burning issues in conservation with an in depth look into the principles of wildlife management. Courses can be chosen based on several areas of interest. In addition to all of this, in all four years of the programme, there are hands-on practicals throughout the year. In the fourth year, there is a choice either to develop a comprehensive conservation plan for a game farm, game reserve or nature area or to conduct a research project on a pre-determined conservation issue.

Language

All the Conservation Ecology courses are presented in English, as this is the only university level, undergraduate course in Conservation Ecology available in South Africa and is widely sought after by foreign students. Following the language policy of the University, tests, exams and assignments may however be submitted in Afrikaans. Note that some of the modules presented outside the department may be presented in Afrikaans.

Costs of study:

Consult the Stellenbosch University Fee Booklet for the most up to date fees breakdown.

Bursaries:

At the undergraduate level, due to a large demand, few bursaries are available for undergraduate study. The situation however changes at the postgraduate level where many more funding opportunities are available. For information on bursaries administered by the University, visit the website of the Centre for Prospective Students:

(<http://www.maties.com/portal/page/portal/Maties/English/Centre%20for%20Prospective%20Student>) or visit the website for Bursaries and Loans (http://web-apps.sun.ac.za/beurse/Ebeursframes_all.html). You could also consult the printed bursary booklet for 2011.

Employment possibilities:

This unique programme equips you to work at solving the world's conservation challenges. You'll have a choice of careers in environmental impact assessment and monitoring (terrestrial and freshwater), restoration ecology, game farm management, ecotourism, community-based natural resource management and environment-oriented, sustainable production in agriculture and forestry (including organic plant management) and in conservation biology research. Should you wish to be placed on a distribution list for news of conservation-related jobs please contact [Prof Karen Esler](#). This service is available to students past and present.

University of Technology or University?

This is the only university level, undergraduate course in Conservation Ecology in the country. Some Universities of Technology do however offer diploma courses in game management and other conservation related fields.

For further enquiries and details please contact the Department of Conservation Ecology & Entomology:

Telephone: (021) 808 3304 (Mrs Monean Wenn) or (021) 808 4005 (Prof Karen Esler)

Fax: (021) 808 4807; e-mail: mwenn@sun.ac.za or kje@sun.ac.za

Website: <http://www.sun.ac.za/english/faculty/agri/conservation-ecology>

4. Module descriptions

The following modules are presented by the ConsEnt department, some of which are specified modules for the Conservation Ecology Programme, others of which are service courses for other teaching programmes within the faculty of Agrisciences. For a full list of modules and programmes presented within the Faculty of AgriSciences, please refer to the University Calendar

(<http://sun025.sun.ac.za/portal/page/portal/Maties/English/Undergraduate%20Prospectus/Agrisciences>).

Also see Appendix 2 for a programme description of the Conservation Ecology course.

43850 NEMATOLOGY MODULE

344	16	Nematology	3L,3P	A
An introduction to nematology, which include morphology, anatomy, classification, biology, identification, control of plant parasitic nematodes of economic importance to agriculture and the control of insects with entomopathogenic nematodes.				

Module co-coordinator and lecturer: Dr. A.P. Malan; Room 2038, JS Marais Building; Tel: 021-808-2821 (Lectures will be in Afrikaans with PowerPoint overheads in English. Notes will be available in Afrikaans and English.)

Aims: This module give an introduction to nematology which include plant and insect parasitic nematodes. The module is introduced with the development of nematology as an independent scientific field. Emphasis is place on the morphological characteristics of diagnostic value as it forms the basis of the taxonomic classification system used for nematodes. The general reproduction and biology of nematodes are discussed. Control of plant parasitic nematodes and the control of insects with the use of entomopathogenic nematodes are covered. Focus is placed on the biology, identification and control of plant parasitic genera of economic importance to agriculture. The lectures are combined with 13 practical session in which extraction techniques, symptomatology and live specimens of nematodes are being studied by stereo and light microscopy. At the end of the module the student should be familiar with the theoretical as well as having a practical knowledge of plant parasitic nematodes and biological control of insects by using nematodes.

Objectives: After completion of the module the student should:

- Be aware of the important role of nematodes in agriculture
- Be able to detect and identify nematodes of economic importance to agriculture
- Preventing and reducing nematode number to non-damaging levels
- The use of insect nematodes as biological control agents against insects

Recommended reading:

Nickle, W.R., 1991. Manual of agricultural Nematology. Marcel Dekker, New York.

Gaugler, R., 2002. Entomopathogenic Nematology. CABI Publishing

Assessment: The class mark will be determined by the mean or the four class tests, an assignment on a specific nematode and the practical examination. A class mark of 45% must be obtained to write the three hour examination of 100 marks at the end of the semester. The final mark is determined by the ratio 40:60 of the class mark and the examination mark.

Lecture and practical programme: The module consists of 44 lectures, on Monday (11:00-11:50), Wednesday (10:00-10:50) and Friday (8:00-8:30) in room 2002 in the JS Marais building. Notes and PowerPoint presentations will be available on WebCT. There will be 13 practicals on Thursday at 14:00 in room 2025 (museum).

34576 ENTOMOLOGY MODULES

314	16	Insect Pest Management	3L,3P	T
Origin and types of insect pests; analysis of an insect problem; methods of control: Biological control, lures, sterilants, juvenile hormones, resistant plants, agrotechnical methods, legislative measures and chemical control; properties and testing of pesticides; pest management. Biology and control of key pests. <i>Subject to continuous assessment.</i>				

Course co-coordinator: Dr J. Terblanche; Room 2034, JS Marais building; Tel: 021-808-4774.

Lecturers: Dr J. Terblanche, Dr P. Addison, Dr F. Roets; Dr R. Veldtman

Aims: ENT 314 introduces students to the principles of integrated pest management (IPM) which includes monitoring insect populations and various types of management methods used to control/suppress pest populations. The focus is on environmentally-friendly methods, which are practical to apply and enhance biological control. The aim is to teach students how to combine the various IPM tools to achieve sustainable pest control, with chemical control as a last option. Emphasis is placed on crops grown in the Western Cape, but the course covers all deciduous fruits, citrus as well as grain crops (e.g. wheat, maize and sorghum). The module involves reading a fair number of scientific and semi-scientific publications relating to specific pests on the various crop types, and using the relevant findings to write assignments. The list of publications is reviewed each year to give the students the latest and most relevant information. The practicals familiarize students with damage symptoms of the main crop pests on the University's experimental farm.

Objectives: The objective of the course is to make students familiar with pest management tactics that are used to keep pest populations in check in modern agriculture. Evaluation is by means of three class tests, three assignments (these will be combined to give the class mark) and an exam. The exam (three hours) will consist of a prepared question, given below, and a test question on the last chapter of the notes (Chemical Control).

Recommended reading: A reference list is provided for each assignment. Books, as well as journal articles not available in the library, will be placed on reserve. Journal articles in the library will have to be located by the students.

Assessment: Each class test will count for 100 marks. The assignments will cover the principles of pest management on specific crops in South Africa. They will also count for 100 marks. The pattern of allocation of marks will be similar to that for the tests, except that there will be more emphasis on information from the reference lists which are handed out with the assignment. One lecture per week (Friday 08:00 – 08:50) will not be used as a formal lecture period. The time can be used for preparing the assignments.

The class mark will be made up of the tests and assignments, each contributing 50 %. In the exam 100 marks will be allocated to the prepared question and 100 to the question on the last chapter of the notes (Chemical Control). The final mark will be determined as explained in the Year Book (in the ratio 40 to 60 for the class mark and exam mark respectively).

Lecture and practical programme: Lectures are held on Mondays (11:00-11:50), Wednesdays (10:00-0:50) and Fridays (08:00-08:50) and are presented in Room 2002, JS Marais Building. Practicals are scheduled on Thursdays (14h00–17h00).

464	16	Insect Conservation Ecology	3L,3P	E
Insects as successful organisms; ethics underpinning their conservation; insects and the conservation of ecosystem processes; threats to insects; management for insect diversity conservation; restoration of insect diversity; conventions and social issues in insect diversity conservation.				

Course coordinator & lecturer: Prof. M.J. Samways; Room 2002, JS Marais building; Tel: 021-808-3728

Aims: This course aims to provide a comprehensive synthesis of the rapidly developing and important field of insect conservation biology. Insects are by far the most speciose animal group on Earth, yet barely known. They play important roles in terrestrial ecological processes and in maintaining the world as we know it. They therefore present particular conservation challenges, especially as a quarter may well go extinct over the next few decades. This course first addresses the ethical foundation of insect conservation, and asks why we should concern ourselves with conservation of a butterfly, beetle or bug. The success of insects and their diversity, which have survived the comings and goings of glaciers, is now facing a more formidable obstacle: the massive impact of humans. After addressing threats, from invasive plants to global climate change, the course then explores ways in which insects and their habitats are prioritized, mapped, monitored and conserved. Both landscape and species approaches are considered. Restoration and the role of conventions and social issues are also covered. On completion of the course, students should have a thorough grounding in insect conservation biology and how to undertake management to conserve insects and other biodiversity.

Objectives: On completion of this module you should:

- Appreciate the diversity and importance of insects to terrestrial ecosystems
- Be able to integrate discussions of insect conservation biology with other facets of biodiversity conservation
- Be able to make decisions regarding practical conservation management of insects

Prescribed Reading: Samways, M.J. 2005. Insect Diversity Conservation. Cambridge University Press, Cambridge.

A comprehensive list of books and other readings will be given for both supplementing the lectures and to provide background for the practical project.

Assessment: Your Final Assessment Mark is based on the following: Test 1 (10%), Test 2 (10%), Practical Project write-up (40%), Exam (40%).

Lecture and practical programme: This course consists of 42 lectures which are held on Mondays (09:00-09:50), Wednesdays (12:00-12:50), and Thursdays (08:00-08:50). Practical time is normally Friday afternoon but as the practical component is either a landscape planning and restoration project OR a research project (your choice), in reality you undertake the practical component at your time of choosing. Lectures take place in the Department of Conservation Ecology and Entomology, J.S. Marais Building, Victoria Street, (Room 2030).

418	32	Insect Diversity	6L,6P	T
Introduction to the Arthropoda and its classes. Nomenclature of insects. Generalised morphology, physiology and anatomy of insects. Growth and metamorphosis of insects. Insect physiology. Diversity and classification of the Hexapoda (Protura, Collembola, Diplura and Insecta) with emphasis on ecologically and economically important groups. <i>Subject to continuous assessment.</i>				

Course co-coordinator: Dr P. Addison; Room 2031, JS Marais building; Tel: 021-808-4671

Lecturers: Dr P. Addison, Dr J. Terblanche, Dr S. Matthee, Dr F Roets, Dr R Veldtman.

Aims: This module serves as an introduction to the Arthropoda and its classes, with emphasis placed on the classification, more important morphological, biological and classificatory properties of the Hexapoda. In order to place the diversity of these classes in an appropriate context, aspects of their functional morphology, including their generalized morphology and anatomy, growth and metamorphosis, will be discussed. We focus primarily on the diversity and classification of the Hexapoda (Protura, Collembola, Diplura and Insecta) with emphasis on ecologically and economically important groups. Practical sessions will be integrated with lectures and will incorporate hexapod morphological analyses and classification techniques. On completion of the module, students should have a good understanding of hexapod diversity its importance in the fields of conservation ecology and applied entomology.

Objectives: On completion of this module you should:

- Have a thorough insight into the more important aspects dealing with the morphology, biology and classification of the Hexapoda
- Be able to classify hexapod species of ecological or economic importance to family level

Recommended Reading: Gullan, P.J. & Cranston, P.S. 2005 and 2009. The Insects: An outline of entomology, Blackwell publishing. Scholtz, Clarke S. & Holm, E. Insects of Southern Africa. Butterworths, Durban (practicals) (out of print, but available in the library) and Picker, M., Griffiths, C. & Weaving, A. 2004. Field guide to insects of South Africa. Struik, Cape Town

Assessment: Rules and regulations dealing with pass marks, as set out in the University's Calendar, are applicable. Three theory tests will be taken after a completion of a number of goals. Study material for tests is cumulative, in other words the second and third test will cover all previous work dealt with. The theoretical evaluation is taken as an average of three and counts 50% towards your class mark. The practical component of this module is as important as the theoretical part of your training. Three practical tasks, consisting of an insect collection, practical identification test and poster will form half your class mark in the ratio of 25:15:10 respectively. To obtain admission to the examinations for this module, your average mark for theory and practical, in other words your class mark, has to be at least 40%. See the rules in the Calendar in regard to pass and examination requirements.

Lecture and practical programme: This course consists of 6 periods per week that are held on Mondays (9:00-9:50 and 11:00-11:50), Wednesdays (10:00-10:50 and 12:00-12:50), Thursdays (8:00-8:50) and Fridays (8:00-9:50) in Room 2020 in the JS Marais Building. Specific details of topics covered during these sessions are available on web-CT. Practical sessions will be held on Thursdays (14:00-17:00) and Fridays (14:00-17:00).

454	16	Applied Insect Ecology	3L,3P	E
Economically important insects; their biology and population dynamics; application of integrated pest management (IPM) tactics on selected crops; ecosystem services. Practicals: Visits to appropriate institutions; pest-risk determination of invasive or outbreak species. <i>Subject to continuous assessment.</i>				

Course co-ordinator: Dr R. Veldtman, Room 2012, JS Marais building;

Lecturers: Dr. R. Veldtman, Dr P. Addison, Dr S. Johnson, Mr M. Addison, Dr J. Terblanche

Aims: In this module, various techniques for managing abundant species in fruit crops and other agro-ecosystems will be dealt with. These agro-ecosystems include deciduous fruit and citrus, veld and forestry and other associated habitats.

During the lectures, the background ecological principles and management methods of selected species will be discussed within a particular agro-ecosystem. During the practicals, students will become familiarized with the identification of various species discussed and learn about specific methods that can be applied in practice to manage abundant species. These practicals will be lab-based practicals or tutorials. The remaining practicals will consist of various visits to institutes/facilities of interest to applied researchers. All practical sessions are compulsory and if you are not able to attend, a doctors' note will be required.

Objectives: To familiarize students with applying various management tactics in combination with ecological principles to effectively manage both detrimental and beneficial economically important insect species within the agro-ecosystem. The module is partly based on self-study, as the weekly lectures consist of an introduction and discussion lecture to be followed up by additional reading in the form of recent and/or important research articles.

Recommended Reading: A reference list is provided to supplement each lecture. Journal articles in the library will have to be located by the students, if they are not electronically available

Assessment: There will be four assessments, consisting of three written assignments and one final test, to be written in the exam time period. One of the assessments will be in the form of a research project in which a report on a specified subject will have to be researched and written. This module is thus subject to continuous assessment. The class mark will be the average of the three assignments (each out of 100) as well a final assessment (out of 200). The final assessment will consist of a practical question (identification of abundant species and/or their damage symptoms or based on material covered in tutorials, out of 100) and a written question (taken from the assignments, out of 100).

Lecture and practical programme: One lecture (Mondays) will be used for a formal introductory lecture, while the other (Wednesdays) will be used for discussing the prescribed literature for each assignment. Once per month, the Friday lecture will be used, in which students are required to attend the IPM meeting with industry researchers, technical advisors and post-graduate students. The other Friday lectures can be used to work on the assignments. The IPM meeting takes place in room 2002 in the JS Marais building, while lectures take place in room 2025.

55638 CONSERVATION ECOLOGY MODULES:

212	8	Conserving Nature	2L,1P	E
What is biodiversity; a brief history of biodiversity; the importance of biodiversity; how many species are there; global patterns in biodiversity; human impacts and species extinctions; maintaining biodiversity, conventions, sustainable use and approaches to conservation. Subject to continuous assessment. Prerequisite Pass: Biology 144				

Course coordinator: Dr S.M. Jacobs; Room 3036, JS Marais building; Tel: 021-808-4441

Lecturers: Dr. Shayne Jacobs/Various Guest Lecturers

Aims: This course introduces you to biodiversity and conservation ecology. Many of the subjects introduced will be covered in detail in subsequent courses in the third and fourth year, hence our coverage in this course is of an introductory nature. We focus on the major concepts such as spatial and temporal patterns in biodiversity, the value of biodiversity, threats on biodiversity and maintenance of biodiversity. The philosophy of the course is to illustrate the theoretical knowledge obtained in lessons with case studies, local and international examples and examples of actual research projects. The lessons (2 per week) take the form of formal lectures and discussions, while the practical sessions can take the form of field excursions, tutorials (individual and group work) and video sessions. A writing course is designed to improve technical reading and writing, which will form an integral part of this and future courses in Conservation Ecology, as well as of a future career.

Outcomes: On completion of this course you should:

- Have a good understanding of the concept of biodiversity and the role of conservation ecology in biodiversity protection
- Grasp the major spatial and temporal patterns of biodiversity, have some insight into the threats facing biodiversity and be conversant in the major approaches to conservation of biodiversity
- Be able to communicate your knowledge on biodiversity clearly and succinctly in written and verbal format

Recommended Reading:

Committee on Noneconomic and Economic Value of Biodiversity, National Research Council. 1999. Perspectives on Biodiversity: Valuing Its Role in an Ever-changing World. National Academy Press, Washington, DC. Available FREE on the web at: <http://www.nap.edu/catalog/9589.html>

Gaston KJ and Spicer JI 1998. Biodiversity: An Introduction. Blackwell Science, Oxford

Primack RP. 2000. A primer for conservation biology. Sinauer Associates Publishers. Massachusetts.

Wilson EO. 1988. Biodiversity. National Academy Press, Washington DC. Available FREE on the web at: <http://www.nap.edu/catalog/989.html>

A selection of research papers will be also provided.

The assessment for this course is continuous. Your final assessment mark is obtained by combining the mark of five assessments, four of which will take place during the semester. The first assignment will take place within the first five weeks of the first quarter and will take the form of a written essay on a subject that will be announced, and will count 15% towards the final mark. The second assignment will take the form of a test, and will count 20% towards the final mark. The third assignment will count 20% towards the final mark and will consist of a group presentation. The fourth assignment (20% of final mark), will take the form of a written assignment/pamphlet/poster. Lastly, an integrative test, contributing 25% to the final mark, will take place on the date and time assigned for BWE212 during the June exams.

This course embraces new and innovative teaching, and we will use and combination of blogs, Web-CT, community interaction and other techniques to allow for deep learning and allow practical application of knowledge gained in the class.

Lecture program: This course consists of 42 lectures that are held on Mondays (8.00-8.50), Wednesdays (9.00-9.50) and Thursdays (12.00-12.50) in Room 3028 in the JS Marais Building (Department of Conservation Ecology and Entomology, 3rd Floor).

244	16	Conservation Censusing	3L,3P	E
Monitoring and survey techniques for major plant and animal taxa; plant/animal/habitat relationships; indices of species richness and diversity; indices of community similarity and differences. Including an introduction to social censusing. <i>Subject to continuous assessment.</i> Prerequisite Pass: Conservation Ecology 212				

Module-coordinator: Dr S. Matthee; Room 2011, JS Marais building; Tel: 021-808-4777

Lecturers: Dr Sonja Matthee, Dr Alison Leslie, Dr Andrew Knight

Aims: The management and conservation of species (especially endangered and threatened species) and the assessment of their associated ecosystems can only be achieved if reliable data are available. Knowledge of numbers and distribution of species is vital to the implementation of strategies for protection and management. To implement effective conservation measures two basic sets of information are needed: 1) information on the composition and distribution of species diversity, and 2) information on how this diversity is affected by environmental change. Three important skills are required to gather this information. These are the ability to 1) know the biology and identify the species you are working with, 2) plan and execute a sampling programme that will yield appropriate and reliable information, and 3) extract relevant information from the data you have gathered. This course aims to equip the learner with the fundamental skills necessary to conduct a biodiversity census, as well as to train them in the use of some of the tools employed to document and quantify biodiversity.

Objectives: On completion of this module you should:

- Have an understanding of the basic sampling and censusing techniques that are applicable to the different systems
- Have an understanding of the principals and statistical techniques required to effectively plan, execute and interpret a ecological census or survey
- Be capable of writing a short scientific report

Recommended Reading: A comprehensive list of books and scientific articles will be given to supplement the lectures.

Assessment: The assessment type of the course is continuous assessment. A final mark will be obtained by combining the marks scored in 3 assignments and two term tests. The assignments will be written as scientific reports and will contribute 50% towards the final mark. The two term test will make up the remaining 50%.

Lecture and practical programme: Lectures are held on Mondays (8:00-8:50), Wednesdays (9:00-9:50) and Thursdays (12:00–12:50) in Room 3028 in the JS Marais Building. Practicals will take place on Tuesday afternoons (14:00-16:50).

314	16	Biome Ecology	3L,3P	E
Introduction to biomes; ecology of tropical and afro-montane forests, woodlands, savannas, treeless vegetation types; wetlands; animal diversity/habitat interactions; patterns of endemism; biological invasion and its management. <i>Subject to continuous assessment.</i> Prerequisite Pass: Conservation Ecology 244				

Module co-coordinator: Prof. K.J. Esler; Room 3011, JS Marais building; Tel: 021-808-4005

Lecturers: Prof. Karen Esler, Dr Shayne Jacobs, Dr Andrew Knight, Prof Belinda Reyers

Aims: To familiarize students with terminology and approaches in biome ecology and ecosystem services. To provide both a global and a regional perspective of biomes; how they are defined and what key ecological drivers influence their structure and function, and the ecosystem services they provide. To provide information on southern African biomes and habitats, with a focus on conservation management. The course provides a strong biological basis for future conservation topics.

Objectives: On completion of this module you should:

- Have an understanding of key ecological principles and management issues in the main global and southern African biomes and major habitats (e.g. wetlands)
- An understanding of ecosystem services, their current status and future trends both globally and in South Africa
- Develop familiarity with common plant and animal taxa in the major southern African biomes
- Read, understand, interpret scientific papers on the topic and to communicate the salient points to others using a variety of communication tools (writing, speaking, poster making)
- Be capable of writing a short scientific report

Recommended Reading: A comprehensive list of books and other readings will be given to supplement the lectures

Lecture programme: Lectures are held on Mondays (12:00-11:50), Wednesdays (8:00-8:50) and Fridays (09:00-09:50) and are presented in Room 3028, JS Marais Building (or alternative if classes too large). Practicals are scheduled on Tuesdays (10h00 – 13h00)

Assessment: To enhance generic skills of students, evaluation takes a variety of different forms, from writing popular articles to compiling web-sites, scientific reports and posters. In order to boost student's knowledge of a range of taxa in southern African biomes, students are required to compile a "species portfolio".

344	16	Introduction to Conservation Management	3L,3P	E
History of humans and their environment; history and philosophy of conservation; environmental ethics; participatory methods in conservation research; cultural conservation; government and community influences on conservation; environmental legislation; conservation management challenges; land-use and hydrology; fire ecology and management; ecotourism and recreation; management plans and research. <i>Subject to continuous assessment</i> Prerequisite Pass: Conservation Ecology 314				

Course coordinator: Ms Rhoda Malgas; Room 3029, JS Marais building; Tel: 021-808-3299

Lecturers: Ms Rhoda Malgas, Dr Shayne Jacobs, Dr. Andrew Knight, Invited speakers

Aims: This course introduces conservation students to the theory and practice of Conservation Management. It starts with the manner in which humans perceive and value the non-human world and further presents how this influences the sustainability of natural resources. It is presented that differences in perceptions and values result in conflicts among natural resources users, especially between state and rural communities. Partnerships between these two stakeholders are considered a win-win conflict management strategy. Real world examples of these partnerships featuring protected area management and ecotourism are highlighted using a case study approach. The effects of land use on hydrology are considered, taking into account the relevant legal frameworks and the prevailing water shortage realities in South Africa. The application of fire in conservation and its management are also considered. Finally, students are introduced to the procedures for developing management plans to prepare them for the management plan project that they should produce in the fourth year. These themes are covered in 42 lectures and 14 practicals. Students should have a good knowledge of the manner in which humans shape the natural environment and be able to develop a sound management plan for a protected area upon the completion of the course.

Objectives: on completion of this module you should

- contextualise the perceptions and values of different stakeholders within the theoretical framework of environmental ethics;
- understand principles of community based natural resource management, and the nature of these forms of conservation;
- be able to understand the rationale for government intervention and the mechanisms for doing so;
- be able to influence the outcomes of natural resources management policies and legislation;
- know that dialogue and partnerships among stakeholders are crucial to sustainable management of natural resources; and
- be able to develop a sound management plan for a protected area.

Recommended Reading: Perman, R., Ma, Y., McGilray, J. & Common, M. 2003. Natural Resource and Environmental Economics. 3rd ed. Pearson Education Limited, Essex.

Assessment: The Final Assessment Mark is obtained by combining the marks scored in three assignments (15% each), practicals (20%), an interactive discussion platform (10%) and the integrative test (25%). Students pass BEW 344 when they score 50 and above. To gain access to the final test, students will have to respond to 80% of all interactive discussions based on classroom discussions and activities. Students are encouraged to attend classes, follow the

lectures and participate in discussions to illuminate their understanding of the slides placed on the webCT.

Lecture programme: This course consists of 42 lectures which are held on Mondays (11:00-11:50), Wednesdays (10:00-10:50) and Fridays (08:00-08:50). Lectures are presented in Room 3028, JS Marais Building.

414	16	Nature Conservation Management	3L,3P	E
Conservation in utilised landscapes; conservation planning; disturbance ecology; grazing; harvesting; ecological monitoring; restoration ecology; current issues in biodiversity and resource conservation, for example: invasive species, climate change, genetically modified organisms, pollution. <i>Subject to continuous assessment.</i> Prerequisite Pass: Conservation Ecology 344				

Course coordinator: Dr Francois Roets; Room 2013, JS Marais building; Tel: 021-808-2635

Lecturers:, Dr Francois Roets, Prof K.J. Esler, Dr S. Matthee (field trip to Robben Island, Ms. Rhoda Malgas, Dr. Sonja Matthee, Dr. Francois Roets; Prof K Esler, Dr Andrew Knight)

Aims: Wise use of natural resources in utilised landscapes has been the motto of Conservation Ecology as utilised landscapes exceed unutilised landscapes that serve as biodiversity conservation areas. Disturbance and restoration ecology is an intrinsic part of utilised landscape use and management. Lectures and debate on disturbance and restoration of biological systems as well as the practicals expose students to the challenges that development poses to conservation and the skills needed to harmonise the two. Lectures, a field trip, and group discussions on current biodiversity conservation issues featuring invasive species, climate change, pollution control, genetically modified organisms, management using disturbances such as grazing, fire and floods, and approaches to restoration of damaged ecosystems. All seek to empower students with knowledge and skills needed to manage natural resources in utilised landscapes. Students are equipped to resolve conflicts between development and conservation as they come to recognise that progress in one need not be at the expense of the other. Thus, the module helps students to develop conservation conflict resolution and management skills. It sets Conservation Ecology programme graduates on a better practical-oriented foundation.

Objectives: On completion of the course students will:

- Understand and appreciate the complexities of current conservation issues from theoretical and management perspectives
- Be familiar with global and national conservation agendas, and the conservation policy frameworks and networks that are in place.
- Be able to compile critical, written syntheses of primary scientific literature and its relevance to conservation management

Recommended Reading: Current papers in the primary literature are used as a basis for discussion (3 per week) and are updated annually.

Assessment: Three essays, class participation and one practical report (20% each). Includes essays, data-based reports and posters, and verbal presentations evaluated by peers.

Lecture programme: Lectures are held on Mondays (12:00-11:50), Wednesdays (8:00-8:50) and Fridays (09:00-09:50) and are presented in Room 3028, JS Marais Building. Practical are

scheduled on Tuesdays (10h00–13h00). A compulsory field trip during the term break is included in the lecture programme.

448	32	Conservation plan / Research project	3L,3P	E
Preparation of a comprehensive management plan for an area, community or species, based on fieldwork conducted during the university vacations. <i>Assessment: Management Plan (October)</i> Prerequisite: Conservation Ecology 314 or 344 Corequisite: Conservation Ecology 414				

Module coordinator: Dr Andrew Knight; Room 3001A, JS Marais building; Tel: 021-808 4532

Aims: This module aim to:

- Equip students to apply their theoretical knowledge to solve practical problems encountered in the field of conservation ecology. The various disciplines such as: Environmental education, Research, Ecotourism, Rehabilitation and restoration, Pollution control, Systems management, Species conservation, Wildlife utilization, Environmental economics, Impact assessment and Product certification (Green labeling) form the basis for these conservation plans
- Introduce students to the practical implementation of a research project, analyzing the data and publication of the results in a standard scientific journal

Objectives: On completion of this module you should:

- Be able to independently plan and implement a research project and prepare the results for publication,
- Be able to independently plan and execute a management programme for various environmental issues,
- Be able to find important planning aids such as maps, aerial photographs, deeds, laws and ordinances etc.
- Be able to solve problems in a structured way,
- Be able to present both verbally and written results in a logical and clear fashion,
- Have made a scientific contribution to the chosen discipline.

Recommended reading: Depends on the chosen field of study

Assessment: Assessment is based on the final management plan or journal article presented by the end of October, after both internal and external moderation

Lecture and practical programme: Lectures & practicals will be scheduled on an ad-hoc basis, but lecturers are available by appointment for assistance and discussions

Students interested in a research project can consult the following staff members:

Prof Karen Esler: Arid zone ecology; invasive alien plants; riparian repair; restoration general; plant ecology general

Dr Shayne Jacobs: Ecosystems ecology; Riparian ecology; Disturbance (Fire, Herbivory) and restoration

Dr Andrew Knight: Conservation planning, research and implementation

Dr Alison Leslie: Wildlife management; aquatic management; EIA

Ms Rhoda Malgas: People and plants

Dr Sonja Matthee: Disease ecology; conservation parasitology

Dr Francois Roets: Insect, plant, fungi interactions
 Prof Michael Samways: Insect conservation & ecology
 Dr John Terblanche: Insect form and function

424	16	Conservation Case Studies and Wildlife Management	3L,3P	E
Decision-making in the face of uncertainty: managing for current climate change; the planning and execution of conservation-based research; wildlife management; sustainable harvesting models and population viability analysis; priority area selection and design; management of alien invasives/WFW/Wetlands; case studies in conservation research. <i>Subject to continuous assessment.</i>				

Course coordinator: Dr A.J. Leslie; Room 3016B, JS Marais building; Tel: 021-808-2487

Lecturers: Dr Alison Leslie and Ms Rhoda Malgas

Aims: This module covers a diverse range of current conservation topics from climate change and sustainable harvesting through transfrontier parks and wildlife management. The aim of this course is to adequately equip you, as future managers, of our environment.

We focus primarily on understanding the possible consequences of climate change for conservation. For example: What types of actions could be undertaken to help mitigate this problem? A current area of conservation concern is that of “sustainable harvesting” – referring to the sustainability of harvesting in both the marine and terrestrial environments. We need to understand the methods that can be used to accommodate harvesting into conservation and resource management plans. We look at a number of case studies in order to gain a better understanding as to the marine extinction crisis and we discuss causes/effects/consequences of extinction vulnerability in various marine populations.

In the second term of the semester we move on to wildlife management, starting with “what is wildlife management” and more specifically how it relates to conservation. As conservationists it is essential that we develop an understanding of morphological and physiological adaptations of animals to their environment. We focus specifically on foraging behaviour as it forms a vital link between the animal and the vegetation. It is essential to understand something about foraging behaviour before important management decisions are made. We look into why certain populations are found where they are, what limits the distribution of wildlife and we discuss distribution and dispersal, as these and others factors affect the rate of spread of a species reintroduced into an area or one recovering from a catastrophic decline. You will gain a sound understanding of the benefits of population modeling as a wildlife management tool. After covering conservation in theory, we discuss the control of wildlife populations. Here we review actual extinctions or near extinctions to see what the most common causes are of extinction in practice. As managers, we need to detect such problems at an early stage and we need to know how to treat a population that is in danger of extinction? We then move on to discuss the importance and functions of transfrontier conservation areas and their potential for application in Africa.

In the lectures we employ a variety of teaching methods, from formal lecturing to discussion groups, debates and seminars. Parallel (and integrated with) the lectures are a series of 6

practical sessions. These incorporate a number of field trips and site visits, and also lab/lecture hall based discussions and debates.

Recommended reading: Numerous text book references will be provided by the various lecturers as well as a selection of research papers. A recommended, although not compulsory, textbook for the second semester Wildlife Management section is: "Game Ranch Management" by J. Du P. Bothma (5th Edition), Van Schaik Publishers.

Assessment: Your Final Assessment Mark is obtained by combining the mark of 5 specific assignments, each linked to a particular section of the module. An assignment can be in the form of an essay, a scientific paper, a poster, a test or an oral presentation. Assignment topics will be made available on Web-CT as the term progresses.

Lecture program: This course consists of 42 lectures that are held on Tuesdays (9.00-9.50), Wednesdays (11.00-11.50) and Fridays (12.00-12.50) in Room 3028 on the 3rd floor of the JS Marais building. Exact dates & details will be available on Web-CT in the first week of the course.

5. Getting started

Academic entry requirements

In order to join the Conservation Ecology programme in the Department of Conservation Ecology and Entomology at the Stellenbosch University, there are a few general requirements, please consult the latest year book for admissions criteria.

* Remember, to be accepted into the Faculty of Agri-Sciences at the University of Stellenbosch you will also have to write an access test. For more details see the application section below.

Application

Detailed information on the application procedure can be found at the following web link:

<http://sun025.sun.ac.za/portal/page/portal/Maties/English>

Any other enquiries can be directed to:

Admissions and Accommodation

Tel: +27 21 808-4515

Fax: +27 21 808-4499

<http://sun025.sun.ac.za/portal/page/portal/Maties/English/Contact%20information>

Information for foreign students

Foreign students seeking admission to SU should contact the International Office of the University of Stellenbosch on <http://www0.sun.ac.za/international/> OR use the **Postal Address:** International Office, Stellenbosch University, Private Bag X1, 7602 Matieland, South Africa; **Tel:** +(2721) 808 4628; **Fax:** +(2721) 808 3799; **E-mail:** interoff@sun.ac.za The International Office handles foreign students' applications and provides them with useful information and assistance regarding Study Permits/Visa, Insurance, Families Accompanying the Student, Accommodation, Arrival and Transfer from the Cape Town International Airport, Language Policy of SU, Academic Programs and Financial Considerations that foreign students have to make once they are admitted to SU. The letter that is sent to confirm an applicant's admission to SU also brings to the attention of the successful candidate these matters that concern foreign students most.

- Please note, that apart from the academic requirements for admission to degree programs, international students have to provide official documentary evidence of their competence in English. The University accepts results from IELTS and TOEFL. Check with the International office for the minimum requirements

In addition to the above all international students are required to take an English proficiency test at the University prior to registration as a student. The International Office will assist international students who are not adequately proficient in English to obtain access to English courses so as to provide a thorough grounding for postgraduate study programs.

Registration

A candidate cannot commence his/her studies until he/she is registered as a student of the University. Details regarding the registration procedure will be sent to the postal address indicated on your application form.

Student identification card

Student identification cards are issued upon first registration and can be obtained from the Cashiers' desk in the Administration A building.

6. Getting to know the department & future options

Getting on the ConsEnt list

General information and announcements relating to the department are distributed via the ConsEnt mailing list. To subscribe to this mailing list send an email to the mailing list manager (mwenn@sun.ac.za).

Annual research day

At the end of the first semester/start of the second, the Department holds a research day consisting of short, student seminars on their research project. The research day is intended to provide a conference-style atmosphere where students receive helpful, constructive feedback and criticism from colleagues in the Department. All postdocs, PhD students in their 2nd and 3rd years and MSc students in their 2nd years will have an opportunity to present. Attendance is also open to undergraduate students and you are encouraged to make use of this opportunity to familiarize yourself with research done within the department.

Attending departmental seminars and meetings

Two important skills of the research scientist are presentation of information in a clear and concise manner and the capacity to critically debate the scientific literature. Therefore students are encouraged to attend the various seminars offered during the year. Information on the seminars can be found at <http://www.sun.ac.za/consecol/seminars.html>. Notification of other seminars of interest will be sent via the ConsEnt distribution list. Further information is also available on the Daily Bulletin of the University.

7. Things you should know

Improving your writing skills

Learning to communicate clearly is an important part of your undergraduate training. People will only understand and react to what you communicate to them. Your writing should therefore be explicit and direct. This does not preclude annotation of your written work with good illustrations or graphs to emphasize a point and improve your communication. After all "a picture says a thousand words".

One way to improve your writing skills is to practice reducing your Fog Index (see below). What is yours?

The fog index

The 'Fog Index' has been used successfully to rate 'readability'. It calculates the amount of fog, obscurity or heaviness in one's writing. A high Fog Index indicates bad writing. The rule is simply

to use short words and short sentences. Churchill said 'I like short, strong words'. He did not say 'My preference is for an abbreviated expressive vocabulary'.

The Index gives an idea of the number of years education needed to read a passage easily.

Fog Index = (average sentence length + % of words with 3 or more syllables) x 0,4.

It is best calculated from a series of 100-word samples chosen at random. Here is the key. Churchill at his best wrote to a six; the index of the Bible is about eight. A good business letter (or seminar) may run to 12, but an index exceeding 13 is dangerous. Many management or test books run at 24. Government notices and legal jargon may approach or exceed 30.

If your Fog Index is excessive, you are handicapping your communication. Your work may be ignored or even misunderstood.

Some examples of obscure writing are given below:

- a) Farmer's Weekly 1980:07:16. Example cited by Symonde Fiske of 'tommy-rot' or 'gobbledygook': 'Priority-wise, wilderness ethics are of profound importance at this particular moment in time. When one considers the social interaction between natural functions and biotic and abiotic elements as well as the vulnerability of ecological stress situations, the manipulation of the natural ecosystem can do much to prove the intrinsic importance of a holistic approach to our intangible assets'.
(Fog Index 20,4)
- b) CBE Style Manual (1976): 'One might well be censured for so tenaciously propounding this hypothesis in view of the weight of evidence to the contrary'. The writer could have said 'I was wrong'.
- c) Legal document: 'All transactions effected pursuant to this instrument shall be effected for the account and risk and in the name of the undersigned; and the undersigned hereby agrees to indemnify and hold you harmless from, and to pay you promptly on demand, any and all losses arising there from or any debit balance due thereon'.
(Fog Index 24,8)

In plain English, 'You will be responsible for anything you owe on your account'.

Brown vs Smith

Test yourself on the following two versions of the same information written in different styles:

Brown's version

In the first experiment of the series using mice it was discovered that total removal of the adrenal glands affects reduction of aggressiveness and that aggressiveness in adrenalectomised mice is restorable to the level of intact mice by treatment with corticosterone. These results point to the indispensability of the adrenals for the full expression of aggression. Nevertheless, since adrenalectomy is followed by an increase in the release of adrenocorticotrophic hormone (ACTH), and since ACTH has been reported (p. Brain, 1972) to decrease the aggressiveness of intact mice, it is possible that the effects of adrenalectomy on aggressiveness are a function of the concurrent increased levels of ACTH. However, high levels of ACTH, in addition to causing increases in glucocorticoids (which possibly accounts for the depression of aggression in intact mice by ACTH), also result in decreased androgen levels. In view of the fact that animals with

low androgen levels are characterized by decreased aggressiveness, the possibility *exists* that adrenalectomy, rather than affecting aggression directly, *has the effect of reducing aggressiveness by producing an ACTH-mediated condition of decreased androgen levels*'.

Smith's version

'The first experiment in our series with mice showed that total removal of the adrenal glands reduced aggressiveness. Moreover, when treated with corticosterone, *mice* that had their adrenals taken out became as aggressive as intact animals again. These findings suggest that the adrenals are necessary for animals to show full aggressiveness.

But removal of the adrenals raises the levels of adrenocorticotrophic hormone (ACTH), and P. Brain found that ACTH lowers the aggressiveness of intact mice. Thus the reduction of aggressiveness after this operation might be due to the higher levels of ACTH which accompany it.

However; high levels of ACTH have two effects. First, the levels of glucocorticoids rise, which might account for P. Brain's results. Second, the levels of androgen fall. Since animals with low levels of androgen are less aggressive, it is possible that removal of the adrenals reduces aggressiveness only indirectly: By raising *the levels of ACTH it causes androgen levels to drop*'.

Which version do you prefer and why?

Analysis

Statistics

	Brown	Smith
No. of words	179	155
No. of sentences	5	9
Sentence length	15-20 words	6-14 words
Fog Index	17,2	9,6

Long words

Brown writes...characterized by decreased aggressiveness...whereas Smith
Writes...less aggressive...

Complicated structures

Brown writes...aggressiveness...is restorable...by treatment (a passive construction see 2.2.3).

Smith writes: when treated...mice...became as aggressive (direct, active construction).

Excess and complicate verbiage

Compare last clause (italicized) in the two versions.

Superfluous phrases

Brown writes 'It is possible that...' and 'In view of the fact that...'.

Smith reduces these to 'might be...' and 'Since...'.

Impersonal writing

Brown never uses *me* or *I* - uses *it* (3rd person). He is careful to avoid any identification of the experiment as his.

Smith is less coy e.g. 'The first experiment in *our* series...showed...'

Paragraphing

Brown puts all his information in one paragraph, whereas Smith distinguishes three points in three paragraphs.

SU writing laboratory: Free consultation services

The Writing Laboratory, a unit of the Language Centre, provides a **free** consultation service to students to improve their writing skills. Consultations are approximately an hour long during which students can discuss their writing assignments with trained consultants, helping writers to think strategically about the writing task and process and to find solutions to writing problems. For more information please contact the Writing Laboratory directly, contact details on their website:

<http://www.sun.ac.za/taalsentrum>

Code of conduct for language in the classroom

This Code of Conduct has been drawn up in order to provide practical guidelines for understanding and implementing the Language Policy and Plan of the US, which was accepted by the University Council in 2002. The Council regards it as important that the Language Policy and Plan of the US should be implemented with integrity.

The Code is offered as an aid for dealing constructively with possible difficulties or uncertainties.

The core principle governing the day-to-day use of language on the campus is that all staff, students and clients of the University are responsible for language matters and may have the expectation that disputes will be approached and dealt with in a spirit of co-operation in which workable solutions are sought.

A distinction is drawn in the Code of Conduct between the responsibilities and expectations of staff and of students.

Complaints on language matters of an academic nature will be dealt with in accordance with standard procedures.

The Language Policy and Plan sets the minimum language requirements for students studying at the University of Stellenbosch (Language plan 2002:5): *As a general rule, students taking an A module or a T module require an academic language proficiency in both Afrikaans and English for effective study at the undergraduate level. A higher level of academic language proficiency is required for postgraduate study.*

Lecturers, especially with regard to their obligations to set and assess assignments, tests and question papers in English and Afrikaans, will be expected within a reasonable time from their appointment to develop sufficient receptive skills (listening and reading) in Afrikaans and English to be able to follow discussions in class, to set assignments and examination question papers in both languages and to be able to understand students' answers in both languages. They should also be capable of judging the equivalence of translations and of fairly assessing answers in Afrikaans and English.

Lecturers' responsibilities:

Lecturers bear the responsibility of:

- Implementing the language specifications of the module being taught in accordance with the requirements of the Language Plan (see especially paragraph 3 of the Language Plan).
- Revising and adjusting the language specifications where necessary and according to the circumstances (new text books, other lecturers).
- Informing students briefly at the beginning of the teaching of the module, orally and in the module framework, of the choices and alternatives for which the language specifications make provision.
- Ensuring that questions in assignments, tests and examinations have exactly the same content in English and Afrikaans.
- Developing sufficient language proficiency to be able to mark assignments, tests and examinations in Afrikaans and English, or making other satisfactory arrangements that it takes place.
- Ensuring that, in accordance with the guidelines for the T option (see 3.3.1.2 of the Language plan), students' language proficiency is sufficiently developed, and the necessary measures are in place to ensure subject-specific language proficiency in Afrikaans and English.
- Striving at all times to act courteously and accommodatingly in situations involving language use (e.g. when questions are asked in English in a class where the language specification for the module is A).

Lecturers' expectations:

Lecturers can expect students to:

- Take note of the characteristics of the language specification applicable to the specification laid down for the module. (See paragraph 3, Language Plan).
- Inform the lecturer of their needs with regard to academic language skills
- Respect the spirit of the Language Policy and plan, especially with regard to the development of skills in a language which is not their language of choice, by deliberately paying attention to it, taking part actively in class and working on their knowledge of subject terminology and subject discourse in both languages. This expectation applies especially to the T specification for modules.

Students' responsibilities:

Students bear the responsibility of:

- Ascertaining the language options for each module and noting especially the consequences; e.g. that translations will not be available in some instances.
- Being honest and open-hearted about their language skills and taking the responsibility for early and appropriate action if they should experience difficulties.
- Deliberately developing the receptive skills (listening and reading) in the language not of choice for learning and teaching by active participation in class.
- Buying and using the prescribed material (especially text books) to improve their language skills in the subject.

- Being courteous and accommodating, and acting accordingly, in situations where language use is at issue, e.g. with regard to the difficulties of the minority group in the class.
- Accepting that one or a few students, because of inadequacies in his/her/their language proficiency, may not exercise or try to exercise a right of veto with regard to the use of Afrikaans or English in the class situation.

Students' expectations:

Students can expect that:

- Help with language skills development will be provided should their academic language proficiency in Afrikaans and/ or English be inadequate.
- They can ask questions and conduct discussions in Afrikaans or English (unless the other languages are required, as in language modules), taking into account their own and the lecturer's language proficiency.
- Afrikaans and English versions of assignments and question papers will be available and will have the same content.
- There will be a sensitivity for language difficulties, so that language errors made under examination conditions will be assessed with discretion.

For the full Language Policy and Plan, see <http://www.sun.ac.za/university/taal/taalbeleid2004.doc>

Improving your statistical skills

Improving your statistical skills will require more than the formal statistical training that you receive. Statistics is something that you never stop learning. Because statistics is a tool, the only way to improve your skill is to apply what you have learnt to real problems, and build your knowledge over time. It is your responsibility to do so. A positive attitude towards statistics is the best place to start. Thereafter, always have some useful texts handy (buying at least one is a very good investment) and keep practicing. The statistical software available to everyone on campus is *Statistica*. This is a fairly user friendly and very powerful software package with which you will be able to run most of the statistical tests that you will need.

Statistics books that will be useful to you throughout your career in science

Legendre L, Legendre P (1998) Numerical ecology. Elsevier, Amsterdam (*this is not a standard statistical book, but deals with some statistics and other analyses used in ecology*)

Quinn GP, Keough MJ (2002) Experimental Design and Data Analysis for Biologists. Cambridge University Press, Cambridge (*very good introduction and up to date on modern techniques*)

Sokal RR & Rohlf FJ (1995) Biometry, 3rd edn. WH Freeman, San Fransisco. (*good for parametric statistics and background theory*)

Zar JH (1984) Biostatistical analysis, 2nd edn. Prentice-Hall, New Jersey (*good for non-parametric statistics*)

Good introductory texts

McKillup, S. 2005. Statistics Explained: An Introductory Guide for Life Scientists. Cambridge University Press, Cambridge.

Quinn GP, Keough MJ (2002) Experimental Design and Data Analysis for Biologists. Cambridge University Press, Cambridge

Plagiarism

What is plagiarism?

Stellenbosch University regards plagiarism as “the theft or use of the ideas, written material and intellectual or artistic products of others that are passed off as one’s own”¹. This includes taking material without acknowledgement from:

- "articles, books, dissertations, theses, newspapers, magazines, notes, course material, co-students' projects, e-mail messages, data, computer code, everything on the Internet, etc. (*written text*);
- books, fine art, graphics, photographs, etc. (*visual text*);
- websites, video productions, films, CDs, design projects, etc. (*multimedia products*);
- compositions, lyrics, CDs, music or sound bites on the Internet, etc. (*music*);
- speeches, audio recordings, lectures, interviews, etc (*spoken text*)²

What is the University Policy on Plagiarism?

All cases of plagiarism constitute a serious offence and may have dire consequences for the offender. It could lead to criminal or civil action or suspension from the University¹. SU has put in place an interim policy to deal with cases of plagiarism until a more permanent policy can be formulated. This policy can be accessed at:

http://www.sun.ac.za/library/eng/help/IG_Programme/Plagiarism/Plagiaat%20Senaat%20Mrt%2006%20_Eng_.pdf

What happens if you get caught?

First time offenders will be asked to appear before a departmental committee comprised of Prof Michael Samways, Prof Karen Esler and Dr Shayne Jacobs. Repeat offenders will be referred to the Central Disciplinary Committee³. **Penalties** that may arise from committing plagiarism may include¹:

- suspension or expulsion from the University;
- forfeiture of a degree or diploma;
- forfeiture of a class mark or other forms of credit that have been attained thus far

In addition, details of the offence and penalty, together with the student’s name, can be made public on notice boards on campus.

What you can do to prevent plagiarism⁴

To prevent plagiarism, you are required to give credit whenever you use:

- “another person’s idea, opinion, or theory;
- any facts, statistics, graphs, drawings—any pieces of information—that are not common knowledge;
- quotations of another person’s actual spoken or written words; or
- paraphrase of another person’s spoken or written words”

¹ University of Stellenbosch. 2006. Interim approach to dealing with plagiarism. Available at: http://www.sun.ac.za/library/eng/help/IG_Programme/Plagiarism/Plagiaat%20Senaat%20Mrt%2006%20_Eng_.pdf [accessed on 1 August 2006]

² University of Pretoria, <http://upetd.up.ac.za/authors/create/plagiarism/definition.htm> [accessed on 1 August 2006]

³ Guide for Post Graduate Students. 2006. Department of Conservation Ecology and Entomology, University of Stellenbosch

⁴ Indiana University, <http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml>. [accessed on 1 August 2006]

8. General information

Photocopying

Photocopying facilities are available in the JS Gericke library or at the Copy shop in the Neelsie student centre. Photocopy credits are automatically debited to your student account at the beginning of each year. The photocopier in Room 3010 is only for official administrative use.

Computer user areas

Computer access for undergraduate students in the Science and AgriSciences Faculties is provided at NARGA. Please be aware of the general rules (www.sun.ac.za/narga) governing computer use in these areas.

General messages related to undergraduate students

There are notice boards throughout the department on which you will find details of scholarships, job opportunities and general information. Further information is available through access on the web and via the ConsEnt distribution list.

Vehicles

Vehicles for official research use can be booked through the technical staff or Monean Heynes. However, bookings need to be approved by your project supervisor. All drivers need to be in possession of a driver's license that has been valid for longer than a year. Also be aware of the general rules for use of US fleet vehicles (Appendix 3).

Using departmental facilities

Our departmental facilities and the various support staff responsible for it, are listed in Appendix 4. Facilities can only be used with prior arrangements. Please follow the necessary instructions when using facilities, and report any damage to facilities and equipment to the person responsible as soon as possible.

Storerooms

The keys to the storerooms can be obtained from the technical staff members or the secretaries. An inventory of the equipment is displayed on the back of the door. Please make sure in advance that the equipment you will need are available for that specific time period (make the necessary bookings if need be). Please be sure to sign out the equipment with the person responsible for the room and to report any defects/damage to equipment when returning it.

9. Occupational health and safety

University safety policy

The University recognizes its obligations to take all reasonable precautions to protect the safety of its employees, students and visitors while they are on campus. The University's Safety Officer is responsible for the initiation and co-ordination of safety programs relating to all official University activities. The department's Safety Officers are Celeste Mockey and Adam Johnson. All potentially dangerous situations should be reported promptly to the safety officers.

Personal safety and security

The safety of people using the campus is the primary interest of Risk and Protection Services (Tel: 808 2330). Reports of assault or harassment on campus should be made to the USBD Office (62 Merriman Avenue).

Departmental safety

Please familiarize yourself with the locations of fire alarms, fire-extinguishers and emergency exits as sign-posted throughout the building. In the event of a fire alarm, obey directions from the safety officers and move to the closest unobstructed emergency exit. Keys to emergency exit doors are located behind glass (red box) next to the doors, should you be forced to make use of locked exit doors. Extinguish the fire, **only** if you know how, by using the correct type of extinguisher. When fighting a fire be sure to stay between an unobstructed exit and the fire itself.

First Aiders

There are several trained First Aiders in the department:

Monean Wenn (Room 3010, Ext. 3304)
Adam Johnson (Room 2040, Ext. 4779)
Celeste Mockey (Room, Ext 4529)
Shayne Jacobs (Room 3106A, Ext 4441)
Pia Addison (Room 2031, Ext. 4671)

Responsibility of first person at scene of emergency

This could be any person on campus. The person has the initial responsibility for dealing with the emergency, having total control of the situation until a more appropriate authority arrives. It is the action of this person that will determine the extent of injury and damage which will result from any emergency. Therefore, it is suggested that the first person on the scene carry out the following procedure, preferably in the order given:

Communicate: Dial **808 2330** give as much detail as possible / Alert departmental safety officer
Contain: Isolate the emergency
Control: Render appropriate assistance

Building security

Building security is very important as there has been a recent spate of thefts from buildings on campus. It is your responsibility to ensure that doors are locked, and remain locked, after hours. Challenge unfamiliar individuals who are acting suspiciously. A polite offer to show them to their destination should be sufficient in most cases. Do not leave valuable personal effects unattended.

Protective clothing and equipment

University regulation requires that:

Every member of the University shall wear laboratory coats and such other protective clothing or equipment as required by law when handling:

- corrosive, toxic or harmful chemicals;
- live or dead animals;
- microbiological preparations including bacteria, fungi, viruses and body fluids; or such other material considered to be harmful to life or clothing.

1. Every member of the University shall wear closed shoes and may not be unshod or wear sandals or thongs when working in laboratories or in those areas where harmful chemicals are in use or there is risk of injury.
2. Members of the University working in workshops or laboratories or other areas of the University using tools or substances which can cause eye injuries shall at all times wear protective safety spectacles.

Material safety data sheets (MSDS)

Before using any chemical substance the user should obtain and study the relevant material data safety sheet. Material Safety Data Sheets should be requested when ordering a new material and a copy kept in an orange folder in the laboratory workplace. MSDS's are also available from suppliers' web sites. You must use the MSDS to fill out a Risk Assessment for the procedure you are undertaking.

Students and staff must be aware of the hazards connected with the substances, equipment and techniques with which they are working and take the necessary precautions in their work. Protective clothing and equipment is available in the departmental and should be used where and when necessary. The Lab Managers should be notified of any deficiencies in this area.

Laboratory safety

- Food or drink must not be consumed in laboratories.
- Closed shoes must be worn at all times in all University laboratories.
- Protective clothing and protective equipment must be used when and where appropriate (eg. safety goggles, gloves, lab coats)
- Students must not commence experiments without their supervisor's approval.
- Technical staff and students may not work alone after hours without their supervisor's approval.
- Broken glass must not be deposited in rubbish bins (approach the support staff in this regard).
- Scalpel blades and hypodermic needles must not be deposited in rubbish bins; but should be disposed of in designated containers (ask your lab supervisor).
- Users must adopt the correct procedure for disposal of all waste materials.
- All members of the department should know the location of the nearest fire alarm, fire hose, fire extinguishers and spill kit.
- Tubing must not be removed from gooseneck taps. Where an eyewash station is not readily available this is the best method of dealing with eye injury - rinse gently under running water. All users must read the labels on chemicals before using them; know their hazards and rigorously adhere to the proper handling procedures. (Check MSDS).
- All gas cylinders in laboratories and workshops must be secured by a strap or chain.
- The volume of dangerous substances in all laboratories must be kept to the minimum necessary for the experiments in progress at any time.
- All members of the department must keep their laboratory areas clean and tidy, and the floor areas clear.
- Spills must be cleaned up promptly.
- Doorways and escape routes must be kept clear at all times.
- All members of the department must promptly report all accidents and fill out report of OHS (ask the Safety Officers).
- Equipment malfunctions must be reported to the technical staff promptly, eg most drain blockages, water leaks, electrical faults etc.

Safe waste disposal

Waste materials must be disposed of safely and in accordance with regulations. If uncertain as to the correct method of disposal, advice should be sought from lab supervisors or the Safety Officers. Most waste materials can be divided into the following categories and disposed of as described below:

- Harmless dry waste like food and paper scraps can simply be left in rubbish bins and waste paper recycle bins for disposal by the cleaning staff. Particulate materials such as sand should be wrapped.
- Hard dangerous waste such as broken glass, hypodermic needles, scalpel blades etc. must be deposited in the hard waste containers provided in the laboratories. On no account may these items be placed in normal rubbish bins.
- Dilute aqueous waste may be poured down laboratory sinks. Strong acids and alkalis should be greatly diluted and neutralised before disposal in this fashion. Dilution should be carried out slowly and by adding the substance to water not the other way around. Do not pour solvents down sinks.

Solvent waste (non radioactive) should be accumulated in bottles for collection by WasteTech. It should be collected in separate containers as follows:

- Water soluble solvents e.g. alcohol
- Chlorinated hydrocarbons e.g. Carbon tetrachloride.
- Highly flammable solvents e.g. ethers
- Acetone
- Mixed classes; e.g. Methanol/Chloroform solvent system.

All bottles should be appropriately labelled and a note should be made on them whenever benzene is present. Full bottles of waste solvent should not be retained in laboratories and the lab manager should be notified so that alternative arrangements can be made. Biological waste such as animal remains must be incinerated according to the following procedure: The material, as dry as possible, must be labelled, securely wrapped in small parcels and taped up. The parcel which must be labeled, should be deposited in the designated waste containers (ask the lab manager). Do not dispose of sand or other noncombustible material by this route.

Appendix 1: Teaching & Technical Staff contact details

Name	Room	E-mail	Extension
Addison, M F (Mr)	2020	mfa@sun.ac.za	
Addison, P (Dr)	2031	pia@sun.ac.za	4671
Esler, K (Prof)	3011	kje@sun.ac.za	4005
Isaacks, M (Mrs)	2040	mcup@sun.ac.za	4779
Jacobs, S (Dr)	3016A	sjacobs@sun.ac.za	4441
Keown, R (Mr)	2040	riaank@sun.ac.za	4779
Johnson, S (Dr)	3052	sjohnson@sun.ac.za	2694
Stokwe, N (Dr)	3001A	nfs@sun.ac.za	4532
Leslie, A (Dr)	3016B	aleslie@sun.ac.za	2487
Louw, C (Mrs)	2007	collouw@sun.ac.za	4775
Malan, A P (Dr)	2038	apm@sun.ac.za	2821
Malgas, R (Ms)	3029	rmalgas@sun.ac.za	3299
Matthee, S (Prof)	2011	smatthee@sun.ac.za	4777
Mockey, C (Ms)		cmockey@sun.ac.za	
Pryke, J (Dr)	2011	jpryke@sun.ac.za	9222
Pringle, K L (Dr)	2039	klp@sun.ac.za	4776
Reyers, B (Prof) – Extraordinary Prof	CSIR	breyers@csir.co.za	
Roets, F (Dr)	2013	fr@sun.ac.za	2635
Samways, M J (Prof)	2010	Samways@sun.ac.za	3728
Terblanche, J (Dr)	2034	jst@sun.ac.za	9225
Veldtman, R (Dr)	2012	veldtman@sun.ac.za	
Jacobs, M (Ms)	3010	mwenn@sun.ac.za	3304

Emergency numbers

Risk and Protection Services 24h Emergency	808 2330
Ambulance	10177 or 883 3444
Fire Brigade	808 8888
Police	10111
Stellenbosch Hospital	887 0310
Electricity	808 8440
Water	808 8343
Poison Information Centre	931 6129

Other useful numbers

IT help line	808 4367
US switch board	*9
US maintenance services	808 4666
Vehicle fleet	808 4466
Student fees	808 4519
Postgrad bursary office	2907/2908

Appendix 2: Outline of BSc Conservation Ecology programme courses (2012)

CONSERVATION ECOLOGY

More information is available on the following web site:

<http://consent.sun.ac.za/> (Department of Conservation Ecology and Entomology)

Bachelor's Programme (BSc) in Conservation Ecology

First Year (132 credits)

Compulsory Modules

Biology	124(16), 144(16), 154(16)
Chemistry	114(16), 154(16)
Computer Skills	171(4)
Geo Environmental Science	124(16), 154(16)
Mathematics (Bio)	124(16)

Second Year (141 credits)

Compulsory Modules

Biodiversity and Ecology	212(16), 264(16), 214(16), 224(16), 254(16)
Computer Skills	272(5)
Conservation Ecology	212(8), 244(16)
Geography and Environmental Studies	214(16)
Microbiology	244(16)

Third Year (136 - 140 credits)

Compulsory Modules

Biometry	212(8), 242(8)
Biodiversity and Ecology	324(16), 334(16), 364(16)
Conservation Ecology	314(16), 344(16)
Industrial Psychology (Special)	354(12)

Choose two of the four modules (as possible within the timetable).

Genetics	214(16) and/or
Soil Science	214(16) and/or
Zoology	315(16) and/or
Sociology	334(12)

Note: in 2012, third year students must follow the 2011 Calender, as follows:

Biometry	212(8), 242(8)
Biodiversity and Ecology	344(16), 354(16)
Conservation Ecology	314(16), 344(16)
Industrial Psychology (Special)	354(12)
Zoology	334(16)

Choose two of the four modules (as possible within the timetable).

Genetics	214(16) and/or
Soil Science	214(16) and/or
Zoology	315(16) and/or
Sociology	334(12)

Fourth Year (136 credits)

Compulsory Modules

Agricultural Economics	262(8)
Agronomy	424(16)
Conservation Ecology	414(16), 424(16), 448(32)
Entomology	464(16), 418(32) or 454(16) and
Soil Science	314(16)

Note: in 2012, 4th year students must follow the 2010 Calender, as follows:

Agricultural Economics	262(8)
------------------------	--------

Agronomy	424(16)
Conservation Ecology	414(16), 424(16), 448(32)
Entomology	464(16), 418(32) or
Geography and Environmental Studies	214(16) and
Soil Science	314(16)

Appendix 3: Rules for the use of US fleet vehicles

THE UNIVERSITY OF STELLENBOSCH RULES FOR THE USE OF FLEET VEHICLES

Office hours: Monday – Friday (08:00-16:30)

1. Fleet vehicles shall be used only for approved trips by staff members and students of the University of Stellenbosch and by authorised, official visitors to the University. No person shall use any such vehicle in his/her private capacity.
2. Fleet vehicles shall be driven and used carefully and responsibly in accordance with the rules and norms laid down by law. Drivers contravening any laws shall be held personally responsible for any fines imposed.
3. Drivers of vehicles shall see to it that Fleet vehicles are parked in the University Vehicle Park after use. When a Fleet vehicle is returned after hours, the vehicle shall still be parked in the Vehicle Park. Only in exceptional cases may a vehicle be parked outside the Vehicle Park for the night, provided that permission to that effect is obtained from Risk and Protection Services, should the Vehicle Park officials no longer be available to grant such permission themselves. Such permission shall be granted on the distinct condition that the Fleet vehicle shall be locked up in a garage or other safe and secure area for the night.
4. It is compulsory to lock both the Fleet vehicle and the safety lock on the gear lever before leaving the Fleet vehicle unattended. In certain instances the additional use of a steering lock shall be compulsory.
5. There shall be no smoking either in Fleet vehicles or in the Vehicle Park and no pets shall be transported in Fleet vehicles.
6. The driver of the Fleet vehicle shall hold a driver's licence which has been valid for not less than one year and shall, on demand, be able to produce such valid driver's licence.
7. The driver of the Fleet vehicle shall complete the trip ticket in full.
8. Before using the Fleet vehicle, the driver shall ensure that the vehicle has a jack, a spanner, a spare wheel, a petrol card (in the key-holder) and the instruction sheet "Dos and Don'ts in Case of an Accident" (in the cubby-hole).
9. The driver shall see to it that the Fleet vehicle has enough fuel for the trip. When taking additional fuel, the driver shall see to it that the tank is filled to capacity ("filled up") and shall pay for the fuel by using the Fleet vehicle's own petrol card. The payment slip shall be returned together with the key and the trip ticket.
10. The Fleet vehicle's fuel tank shall be at least half full when the vehicle is returned to the US Vehicle Fleet.
11. The Fleet vehicle's petrol card shall not be offered for payment at a toll gate or a parking area.
12. The Fleet vehicle shall be kept clean and tidy.
13. Booked times shall be adhered to strictly and bookings shall be cancelled 24 hours prior to the time booked.
14. Any damage to the Fleet vehicle sustained during the period of use shall be reported to the US Vehicle Fleet within 12 (twelve) hours of the incident.
15. **The Fleet vehicle user / his/her Division / Department / Society / Club / House Committee shall be liable for any damage to the vehicle sustained during the period of use to a maximum amount of R2 500, being the insurance excess fee, which amount shall be debited from the user's relevant cost centre.**
16. In the event of any failure to comply with the rules stated above, the following additional fine(s) shall be imposed on the Fleet vehicle user / his/her Division / Department / Society / Club / House Committee. In accepting the key to the Fleet vehicle, the Fleet vehicle user in so doing explicitly gives permission for the relevant fine(s) to be recovered on demand from his/her salary, student account or cost centre, as the case may be.
 - 16.1 The full cost of repairs for damage resulting from any unauthorised, malicious, or wilful act of the driver.
 - 16.2 The full cost of repairs where damage to the Fleet vehicle was not reported to the US Vehicle Fleet within 12 (twelve) hours of the time of the incident, and where a Fleet vehicle was stolen and the driver had failed to lock the vehicle as stipulated in paragraph 3 and 4 above.
 - 16.3 When the Fleet vehicle is returned more than 30 (thirty) minutes late without permission.....R80,00 (eighty rand)
 - 16.4 When the Fleet vehicle is returned with less than half a tank of fuel.....R50,00 (fifty rand)
 - 16.5 When a booked vehicle is no longer required, and cancellation didn't take place 24 hours prior to collectingR40,00 (forty rand)
 - 16.6 When the inside of the Fleet vehicle is left dirty and/or untidy.....R40,00 (forty rand)
 - 16.7 When the vehicle's doors and/or gear-lever lock were/was not locked/taken without permission.....R100,00 (hundred rand)

THEFT: Immediately phone 021-808 4611 or USBD 021-808 4891 or 0860 60 11 37 (after hours) and then phone S.A.P.D

Appendix 4: Departmental facilities and assigned staff

Facility	Room number	Contact person	Tel. no. (extension)
Lecture/Seminar Room	3028	Monean Wenn	3304
Computer Lab	3003	Celeste Mockey	4529
Plant Ecology Lab	3012		
-80°C Freezers	3015		
General Lab	3018		
Chemical Store	3019		
Store Room	3021		
Map Room	3029		
Seed Room	3030		
Store Room	3031		
GIS Computer Lab	3033		
General Lab	3038		
Postgrad Lab	2003	Riaan Keown	4779
Postgrad Lab	2004		
Computer Room	2005		
Cold Room	2019		
Cold Room	3045		
Postgrad Lab	2021		
Postgrad Lab	2022		
Postgrad Lab	2027		
Chemical Store	2036		
Cold Room & Freezer Room	3025 & 3026		
Incubation Room	3023		
Incubation Room	3024		
Incubation Room	3027		
Postgrad Lab	3041		
Postgrad Lab	3051		
Postgrad Lab	3053		
Glassware Room	2037	Marlene Isaacks	4779
Nematology Lab	2042	Dr Antoinette Malan	2821
Museum	2025	Dr Pia Addison	4671
D.N.A. Lab	2045	Dr Antoinette Malan	2821