

Department of Conservation Ecology & Entomology

Guide for Undergraduate Students

2021

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



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1. Who's who?

			Tel. Ext.	Room
Chair of Department	Prof. Francois Roets	fr@sun.ac.za	2635	3048
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	Prof James Pryke	jpryke@sun.ac.za	9222	3047
Research coordinator	Prof. John Terblanche	jst@sun.ac.za	4774	2034
Departmental Secretaries	Ms Monean Jacobs Ms Colleen Louw	mwenn@sun.ac.za collouw@sun.ac.za	3304 4775	3010 2007
Departmental Safety Officer	Mr Riaan Keown	riaank@sun.ac.za	4779	2040
Student Councillor	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://www.sun.ac.za/english/learning-teaching/student-affairs/csc>

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://gids.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 behaviour. 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 utilized landscapes at all spatial scales (global, continental, national and 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 is run across multiple faculties including the Faculty of AgriSciences, studying subjects dealing with conservation ecology, biodiversity and applied sciences, such as geographical information technology and computer skills. The third year continues with conservation ecology, biodiversity and ecology, and courses in biometry, forest science, soil science and agricultural economics. 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. In the third and fourth year some 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 also an opportunity to conduct a research project on a pre-determined conservation issue.

Language

All the Conservation Ecology courses are presented in English, as this is a Conservation Ecology degree programme available in South Africa that 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 both Afrikaans and English.

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>).

Employment possibilities:

This unique programme equips you to work at solving the world's conservation challenges. You will 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 or added to the Conservation Ecology facebook page (post-graduation) 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 a sought after undergraduate course in Conservation Ecology. 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 Jacobs) or (021) 808 2635 (Prof Francois Roets)

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 2021 Faculty Yearbook.

<http://www.sun.ac.za/english/Documents/Yearbooks/Current/2021-AgriSciences.pdf>

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 includes plant and insect parasitic nematodes. Morphological characteristics of diagnostic value, reproduction and biology in general. Agricultural control of plant parasitic nematodes and the control of insects by using insect parasitic nematodes. Identification and biology of specific plant parasitic and insect nematode genera of economic importance. Extraction techniques and identification of life specimens by means of light microscopy. <i>Subject to flexible assessment</i>				

Module co-coordinator: Dr. Noma Stokwe; Room 2044, JS Marais Building; Tel: 021-808-2546 (Notes will be available in Afrikaans and English.)

Lecturers: Dr. Noma Stokwe. Prof. A.P. Malan

Aims: This module gives 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; integrated pest management. Biology and control of key South African pests.				
<i>Subject to flexible assessment</i>				

Course co-coordinator: Prof John Terblanche. Room 2034, JS Marais building; Tel: 021-808-9225.

Lecturer: Dr Minette Karsten

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 familiarise students 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
Topics in this course include: 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, insect response to global change and social issues in insect diversity conservation. These topics are presented in the field of insect conservation, with a special interest in conservation agriculture, but all these principles are applicable across the entire conservation field. <i>Subject to flexible assessment</i>				

Course coordinator & lecturer: Prof James Pryke; Room 3047, JS Marais building; Tel: 021-808-9222

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. Importantly, this is also a capstone course for biodiversity conservation in general.

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 (20%), Test 2 (20%), Practical Project write-up (30%), Exam (30%).

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 2002).

418	32	Insect Diversity	6L,6P	E
<p>Introduction to the Arthropoda and its classes; nomenclature of insects, generalised morphology, physiology and anatomy of insects; growth and metamorphosis of insects; diversity and classification of the Hexapoda (Protura, Collembola, Diplura and Insecta) with emphasis on ecologically and economically important groups.</p> <p><i>Subject to flexible assessment</i></p>				

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

Lecturers: Prof P. Addison, Prof J. Terblanche, Prof S. Matthee, Prof Francois Roets

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 SunLearn platform. Practical sessions will be held on Thursdays (14:00-17:00) and Fridays (14:00-17:00).

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. <i>Subject to flexible assessment.</i>				

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

Lecturers: Prof Shayne Jacobs, Ms Rhoda Malgas and 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 occasional field excursions, tutorials(individual and group work) and video sessions. Assignments emphasizing scientific writing formsan integral part of the course, and aims to improve technical reading and writing, which will form an important 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:

Sodhi, N.S. and Ehrlich, P.R. eds., 2010. *Conservation biology for all*. Oxford University Press.
FREE TEXTBOOK

http://tuxchi.iztacala.unam.mx/disweb/demo_ecologia/pdfs/libros/conbio.pdf

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 flexible. Your final assessment mark is obtained by combining the mark of several assessments, most of which will take place during the semester. The first assignment will take place within the first four weeks of the first quarter and will be followed by a written essay on a subject that will be announced. Other assignments could take the form of tests, group assignment involving poster presentations, blog posts and practical reports. Lastly, an integrative test, contributing a large percentage 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, SunLearn platform, 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
Planning and conducting monitoring and biodiversity surveys for major plant and animal taxa, including indices for river system health and ecological integrity; social censusing and its importance in conservation; develop experience in indices of species richness and diversity; introduction to community composition and differences. Exposure to taxonomic identification of insect orders and small mammal species.				
<i>Subject to flexible assessment.</i>				
<i>Prerequisite Pass: Conservation Ecology 212</i>				

Module-coordinator: Prof S. Matthee; Room 3016a, JS Marais building; Tel: 021-808-4777

Lecturers: Prof Sonja Matthee, Dr Alison Leslie and a guest lecturer

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 provided to supplement the lectures.

Assessment: The assessment type of the course is flexible assessment. A final mark will be obtained by combining the marks scored in two assignments and two term tests. The assignments will be written as scientific reports and will contribute 50% towards the final mark. The two term tests will make up the remaining 50%. Short class tests are also conducted on a regular basis.

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 and ecosystem services; key drivers; social-ecological systems of dynamics and biome-level management issues; ecology of tropical and afro-montane forests, woodlands, savannahs, treeless vegetation types; wetlands; patterns of diversity and endemism. <i>Subject to flexible assessment.</i>				

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

Lecturers: Prof. Karen Esler, Dr Shayne Jacobs, Prof Francois Roets and guest lecturer.

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 basis for future conservation topics.

Objectives: On completion of this module you should:

- Have an improved ecological knowledge of South African biomes, habitats and species
- Develop an understanding of biomes in a social-ecological context
- Gain knowledge of ecosystem services across biome types
- Ability to access and organize biodiversity-related information in a clear and meaningful way
- 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 and to construct an infographic

Recommended Reading: A comprehensive list of books and other readings will be provided 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	Conservation in Social-Ecological Systems	3L,3P	E
<p>344 (12) Conservation in Social-Ecological Systems (3L, 3P)</p> <p>The relationship between society and the natural environment; history, values and philosophy of conservation; environmental and research ethics; government, societal and business influences on conservation; environmental legislation; environmental impact assessment (EIA); challenges in community based natural resource management; human environmental stressors; the meaning of “the environment” and “nature” to people of various cultural and social backgrounds; conservation management for ecotourism and recreation; social-ecological systems and resilience theory.</p> <p><i>Subject to flexible assessment</i> <i>Prerequisite Pass: Conservation Ecology 314</i></p>				

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

Lecturers: Ms Rhoda Malgas and various guest lecturers.

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	Contemporary Conservation	3L,3P	E
<p>414 (16) Contemporary conservation (3L, 3P)</p> <p>Contemporary conservation issues in utilised landscapes; conservation planning; disturbance ecology; grazing; harvesting; ecological monitoring; restoration ecology; current issues in biodiversity and resource conservation, for example: invasive species, ecosystem health and emerging diseases, climate change, genetically modified organisms, pollution. There is a compulsory field trip during the Easter vacation.</p> <p><i>Subject to flexible assessment.</i></p>				

Course coordinator: Prof Francois Roets; Room 3048, JS Marais building; Tel: 021-808-2635

Lecturers: Prof Francois Roets, Prof K.J. Esler, Prof J. Pryke, Prof S. Matthee (compulsory field trip during the first term break (excluding Easter weekend), enquires: Prof. Francois Roets.

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: Practical assignments: 65% of total mark, Field Trip Assignment, 10% of total mark, Integrative Test: 25% of total mark.

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 2020, JS Marais Building. Practicals are scheduled on Tuesdays (10h00–13h00). A compulsory field trip during the term break is included in the lecture programme.

448	32	Research project	3L,3P	E
<p>Students develop and undertake a research project with supervision from a staff member with appropriate expertise. Project ideas can be co-developed between the student, course coordinator and conservation agencies, such as CapeNature, South African National Parks, private reserves and conservation non-government organisations (NGOs). Research projects could be for government or private reserves, or be species or community specific, e.g. a species recovery plan for a threatened species or ecosystem. Research projects can be on any topic related to nature conservation generally and agreed on between the student, supervisor and the programme co-ordinator.</p> <p><i>Assessment: Report / mini-thesis (due October)</i></p> <p><i>Prerequisite module: Conservation Ecology 314 or 344</i></p> <p><i>Corequisite module: Conservation Ecology 414</i></p> <p><i>Home department: Conservation Ecology and Entomology</i></p>				

Module coordinator: Prof James Pryke, Room 3047, JS Marais building; Tel: 021-808 9222

Aims: The BWE 448 project is a 4th year conservation course, run through the Department of Conservation Ecology and Entomology, Stellenbosch University, which is structured as a project. The project has to be on a conservation topic, and would need to take the form of a management plan or a research project.

The aim of this course is to introduce students to real world projects and situations. We actively encourage students to interact with conservation professionals (both within and outside

Stellenbosch University). The project will teach students how to manage a project, interact with other conservation professionals and gain elementary research or management skills. This project also provides students with an opportunity to see which aspects of conservation they enjoy and help them to plot career paths. We encourage students to do projects that have impact on real world conservation.

Objectives: The research projects can cover a broad scope of possible conservation research topics. Research projects need to have a strong conservation dimension and can be on an ecological, social or economic topic. Project aims and structure need to be negotiated between the student and appropriate supervisor with relevant expertise. These projects need to be written as a scientific paper. This means that students should follow the structure and styling of a relevant journal. Furthermore, the language and analyses in the project need to be scientific and appropriate for the topic. The ultimate goal of these projects is to be able to submit them as a paper for publication.

Recommended reading: Discuss with supervisor.

Assessment: The assessment for this course is broken down into 4 assignments: 1) Written proposals (10% of final mark); Presentation (10%); Draft for supervisor (10%); Final report (70%)

Lecture and practical programme: This course is 32 credits, which means that students are expected to work approximately 12 hours a week on the project. There are no lectures for this course. Students are expected to do at least 3 weeks of fieldwork, in projects where this is not possible this time is expected to be made up with extra lab work or data analyses. Students have to have a supervisor to guide them through the project.

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

Pia Addison: Integrated Pest Management (IPM), taxonomy of pests and their natural enemies, Ecology of pests and their natural enemies

Karen Esler: Restoration Ecology, Invasion Biology, Wetland and Riparian ecology, Seed and seed bank ecology

René Gaigher: Arthropod conservation ecology, Biodiversity in production landscapes, Arthropod natural enemies, Invasive arthropod management

Shayne Jacobs: Water Resources in Natural and Modified Ecosystems, Drought Resistance of Native and Invasive Plants, Invasive species impacts, Rangeland Ecology (Degradation and Restoration of Semi-arid & Arid Rangelands), Restoration Ecology (Riparian, Mining Restoration) Sustainable Agriculture (Water Optimization for Food and Nutritional Security)

Alison Leslie: Wildlife management, Large mammal, ecology, physiology, behaviour; Human-wildlife conflict

Rhoda Malgas: Local Ecological Knowledge (LEK) and production practice for commercially important honeybush species amongst small-scale land-users, Climate change response and commercial resource base of commercially important plant species

Sonja Matthee: Small mammal diversity and ecology, Fragmentation and effect on small mammals, Nesting behaviour of African penguins, Host-parasite relationships. Parasite ecology

James Pryke: Landscape ecology, Biodiversity in agriculture, Agroecology, Biodiversity patterns across fragmented landscapes, Insect conservation, Urban ecology, Community ecology

Francois Roets: Insect-plant-microorganism interactions, Arthropod biodiversity, Dung beetle ecology and diversity, Diseases and herbivores of native trees, Oxalis (clover) ecology and diversity

Molecular ecology, population genetics and phylogenetics

Michael Samways: Dragonfly behaviour, Insect conservation, Agro-biodiversity, Freshwater ecology, Conservation of rare and threatened species.

Noma Stokwe: Nematology and insect pest management.

Antionette Malan: Nematology and insect pest management.

John Terblanche: Terrestrial animals and their environmental adaptations, including phenotypic plasticity, Respiratory metabolism and gas exchange patterns, insect respiratory chemoreception and physiological responses to oxygen and temperature.

424	16	Wildlife Management in a changing environment	3L,3P	E
Decision-making in the face of uncertainty; sustainable harvesting in both terrestrial and marine environments and wildlife management. The wildlife management (WM) section incorporates the principles of WM, habitat and game assessment, grazing management, sustainable utilisation, game capture and translocation, wildlife diseases, nutritional ecology and contraception methods; human-wildlife conflict/coexistence issues, and planning and executing conservation-based research. Case studies in conservation research are also discussed. <i>Subject to flexible 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 and guest speakers.

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

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. This often necessitates an understanding of the ecological, social and economic drivers that lead people to make decisions about harvesting practices. More and more demands are being made on conservationists to engage with local communities and land- users in the management of natural capital. You will be introduced to techniques and tools to facilitate participatory decision-making of wild natural plant resources with local land-users and others partners. Some attention will be given to the “how” of community engagement as well as field work and ecological data collection. We will examine a few case studies of wild plant species, and consider the conservation-oriented opportunities in the marketing of some South African wild harvested products. Policies on sustainable harvesting will be debated as help or hindrance, and will be considered when we will talk about our role as researchers in contributing to the field of sustainable harvesting. On the subject of marine harvesting, 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.

We continue the module by gaining an understanding as to the science of 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. 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. Later in the semester we delve into the sustainable use of wildlife and the role of biltong and commercial hunters in wildlife management.

And much more....

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 14 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 Wildlife Management section is: "Game Ranch Management" by J. Du P. Bothma (6th Edition), Van Schaik Publishers.

Assessment: Your Final Assessment Mark is obtained by combining the mark of 5-6 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, an opinion piece, a test or an oral presentation. Assignment topics will be made available on the SunLearn platform 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 the SunLearn platform 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 Agrisciences 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://www.sun.ac.za/english/maties>

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 www.sun.ac.za/english/SUinternational 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:** <http://www.sun.ac.za/english/SUinternational/contact-us/meet-the-team> 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, (usually the month of May) 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 their work either in the form of an oral presentation or via a poster. 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. Notification of seminars of interest will be sent via the ConsEnt distribution list. Please contact Ms Monean Jacobs (mwenn@sun.ac.za) to add your email to the seminar notification 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 your fog index?

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>

http://www0.sun.ac.za/languagecentre/?page_id=240

Code of conduct for language in the classroom

The 2017 SU language policy refers: <http://www.sun.ac.za/english/about-us/language>

In the Department of Conservation Ecology & Entomology, all of our modules are presented in English, however students have the option of responding to questions, both oral and written, in Afrikaans. Bearing in mind that modules followed in other faculties may be presented in Afrikaans (together with English slides), however the same applies. In accordance with the faculty guidelines, all students are given the option of a translation service at the start of each module.

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 *R-studio* and *Statistica*. These are fairly user friendly and very powerful software packages with which you will be able to run most of the statistical tests that you will need. The University library also offers a range of excellent statistical books/journals.

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*);

¹ University of Stellenbosch. 2016. Interim approach to dealing with plagiarism. Available at:

https://sunrecords.sun.ac.za/controlled/C4%20Policies%20and%20Regulations/SU%20Plagiarism%20Policy_2016.pdf

- 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*)

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 University. 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:

https://sunrecords.sun.ac.za/controlled/C4%20Policies%20and%20Regulations/SU%20Plagiarism%20Policy_2016.pdf

What happens if you get caught?

First time offenders will be asked to appear before a departmental committee. Repeat offenders will be referred to the Central Disciplinary Committee. **Penalties** that may arise from committing plagiarism may include:

- 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 plagiarism

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"

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 Jacobs. However, bookings need to be approved by your project supervisor as a payment is required. 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 Officer Riaan Keown (021 808 4779 & Room 2006 JS Marais Building). All potentially dangerous situations should be reported promptly to the safety officer.

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 Jacobs (Room 3010, Ext. 3304)

Riaan Keown (Room 2040, Ext. 4779)

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 labelled, should be deposited in the designated waste containers (ask the lab manager). Do not dispose of sand or other non-combustible 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 (Prof)	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 (Prof)	3016A	sjacobs@sun.ac.za	4441
Keown, R (Mr)	2040	riaank@sun.ac.za	4779
Johnson, S (Dr)	3052	sjohnson@sun.ac.za	2694
Karsten, M (Dr)	2022	minnettem@sun.ac.za	
Leslie, A (Dr)	3016B	aleslie@sun.ac.za	2487
Louw, C (Mrs)	2007	collouw@sun.ac.za	4775
Malan, A P (Prof)	2038	apm@sun.ac.za	2821
Malgas, R (Ms)	3029	rmalgas@sun.ac.za	3299
Matthee, S (Prof)	3016a	smatthee@sun.ac.za	4777
Pryke, J (Prof)	3047	jpryke@sun.ac.za	9222
Roets, F (Prof)	3048	fr@sun.ac.za	2635
Samways, M J (Prof)	2010	Samways@sun.ac.za	3728
Terblanche, J (Prof)	2034	jst@sun.ac.za	9225
Stokwe, N (Dr)	3001A	nfs@sun.ac.za	4532
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 (125 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)
Geographical Information Technology	214(16)

Third Year (128 credits)

Compulsory Modules

Biometry	212(8), 242(8)
Biodiversity and Ecology	324(16), 334(16)
Conservation Ecology	314(16), 344(16)
Agricultural Economics	262(8)
Forest Science	212(8)

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

Genetics	214(16)
Soil Science	214(16)
Biodiversity and Ecology	315(16)
Biodiversity and Ecology	345(16)
Biodiversity and Ecology	364(16)
Geographical Information Technology	241(16)

Fourth Year (128 or 136 credits)

Compulsory Modules

Agronomy	424(16)
Conservation Ecology	414(16), 424(16), 448(32)
Entomology	464(16)

Choose module(s) to the value of 32 credits from the modules below that fit into your class, test and examination timetables.

Nematology	344(16)
Entomology	418(32)
Geography and Environmental Studies	214(16)
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 Jacobs	3304
Computer Lab	3003	Riaan Keown	4779
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	Prof Antoinette Malan	2821
Museum	2025	Prof Pia Addison	4671
D.N.A. Lab	2045	Prof Antoinette Malan	2821