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Van Hoven, W., MSc DSc(Potchefstroom) PrSciNat(Environ) ..... Associate Professor
Van Niekerk, W.A., MSc(Agric) PhD(Pretoria)
PrSciNat(Anim) SAAPAS SASAS ..... Associate Professor
Hassen, A., MSc(Agric)(Tanz) PhD(Pretoria) ..... Senior Lecturer
Meyer, J.A., MSc(Agric) PhD(Pretoria) SAAPAS SASAS ..... Senior Lecturer
Strydom, P.E., MSc(Agric)(Pretoria) PhD(Free State) ..... Senior Lecturer
Van Marle-Köster, E., BSc(Agric)(Pretoria) BSc(Agric)(Hons)
MSc(Agric)(Free State) PhD(Pretoria) Dipl. Development
Studies(Unisa) PrSciNat(Anim) SAAPAS SASAS ..... Senior Lecturer
Coertze, R., BSc(Agric)(Hons)(Pretoria) ..... Lecturer
Jansen van Rensburg, C., MSc(Agric) PhD(Pretoria) SASAS ..... Lecturer
Somers, M.J., MSc(Wildlife Management)(Pretoria)
PhD(Stellenbosch) ..... Lecturer
Van Essen, L. D., MSc(Pretoria) PrSciNat(Environ) ..... Lecturer
Visser, C., BSc(Agric) BSc(Agric)(Hons) MSc(Agric)(Pretoria)
SASAS PrSciNat(Anim) ..... Lecturer
Basson, A., BSc(Agric)(Pretoria) ..... Junior Lecturer

Department of Consumer Science
De Klerk, H.M., MSc(Home Econ) PhD(Pretoria) ..... Associate Professor (Head)

Erasmus, A.C., BSc(Home Econ) BSc(Home Econ)(Hons)
M(HomeEcon) PhD(Pretoria) ..... Associate Professor
Du Rand, G.E., B Home Econ Ed B Home Econ(Hons)(Stellenbosch)
MSc(Home Econ) PhD(Pretoria) ..... Senior Lecturer
Donoghue, S., B Home Econ(Hons) M(Home Econ)(Pretoria)
PhD(Pretoria) ..... Lecturer
Jacobs, B.M., Dipl in Tertiary Education(Pretoria)
B Home Econ(Hons) MConsSc(Pretoria) .....Lecturer
Pienaar, J.M.M., B ConsSc MConsSc(Pretoria).....Lecturer
Retief, A., BSc Home Econ(Hons) M(Home Econ)
PhD(Pretoria) ..... Lecturer
Sonnenberg, N., BHomeEcon BHome Econ(Hons)
MConsSc(Pretoria) ..... .Lecturer
Strydom, M., B Home Econ(Pretoria) BSc(Hons)
Home Econ(Potchefstroom) M ConsSc(Pretoria) ..... Lecturer
Van der Spuy, H.H., BSc(Hons)(Dietetics)(Stellenbosch)
M ConsSc(Pretoria) ..... Lecturer
Viljoen, A.T., Dipl Hosp Dietetics(Free State) MDietetics(Pretoria) ... Lecturer
Tselepis T.J., B Home Econ M ConsSc(Pretoria) ..... Junior Lecturer
Visagie, M., B ConsSc(Cloth Mgt)(Stellenbosch)..... Junior Lecturer

Department of Food Science
Minnaar, A., BSc(Agric)(Hons) PhD(Pretoria) ..... Professor (Head)
Taylor, J.R.N., BSc(Hons)(CNAA) Post-Grad.Cert.Ed.(Nottingham)
PhD(Trent) DSc(Pretoria) ..... Professor
Buys, E.M., BSc(Hons)(Potchefstroom) MSc(Pretoria)
PhD(Witwatersrand).....Associate Professor
De Kock, H.L., BSc(Home Ec)(Hons) MSc(Agric) PhD(Pretoria) .....Senior Lecturer
Duodu, K.G., BSc(Ghana) MInstAgrar PhD(Pretoria) ..... Senior Lecturer
Emmambux, M.N., BSc(Hons)(Mauritius) MSc PhD(Pretoria) ..... Lecturer

Postgraduate School of Agriculture and Rural Development
Machethe, C.L., BSc(Agric)(Hons)(Fort Hare)
MSc(Agric)(University of the North) M.S. PhD(Michigan
State) ..... Professor / Director

South African Institute for Agricultural Extension
Düvel, G.H., Dip Agric(Cedara) BSc(Agric) MInstAgrar
DInstAgrar(Pretoria) PrSciNat..... Director

School of Mathematical Sciences
Lubuma, J.M-S., MSc PhD(Louvain, Belgium) ..... Professor (Chairperson)

Department of Statistics
Crowther, N.A.S., BSc(Hons)(Free State) MSc(Port Elizabeth)
DSc(Free State) ..... Professor (Head)
Stoker, D.J., MSc(Potchefstroom) MSc(Stellenbosch)
Dr(Math et Phys)(Amsterdam) ..... Honorary Professor
Steyn, H.S., BSc MSc(Free State) PhD(Edin) DSc(Pretoria)..... Extraordinary Professor
Smit, C.F., MSc DSc(Pretoria) ..... Professor

Van Zyl, G.J.J., BCom(Hons)(Stellenbosch) Dip Stat(Oxon) PhD(North Carolina)..... Professor, Acting ..... Director
Bekker, A., MSc(Johannesburg) PhD(Unisa)..... Senior Lecturer
Debusho, L.K., MSc(Addis Ababa) PhD(KwaZulu-Natal)..... Senior Lecturer
Fletcher, L., MSc PhD(Unisa)..... Senior Lecturer
Kanfer, F.H.J., MSc PhD(Potchefstroom) ..... Senior Lecturer
Kasonga, R.A., MSc PhD(Canada)..... Senior Lecturer
Louw, E.M., MSc PhD(Pretoria) ..... Senior Lecturer
Millard, S.M., MCom(Pretoria)..... Senior Lecturer
Swanepoel, A., MSc(Port Elizabeth) ..... Senior Lecturer
Basson, E.M., BSc BSc(Hons) MSc(Pretoria)..... Lecturer
Bodenstein, L.E., BCom(Hons) MCom(Pretoria)..... Lecturer
Crafford, G., BSc(Hons) MSc PhD(Pretoria) ..... Lecturer
Corbett, A.D., BCom BSc(Hons)(Pretoria) ..... Lecturer
De Villiers, G.M., BSc(Hons) MSc(Pretoria)..... Lecturer
Ehlers, R., BSc(Hons) MSc(Pretoria)..... Lecturer
Human, S. W., BSc(Hons) MSc(Pretoria) ..... Lecturer
Pauw, J., BSc(Hons)(Pretoria) MSc(Unisa) ..... Lecturer
Strydom, H.F., BSc(Hons)(Pretoria) MSc(Unisa) HED(Pretoria) ..... Lecturer
Van Staden, P.J., BCom(Hons) MCom(Pretoria)..... Lecturer
Adamski, K., BSc(Hons)(Pretoria)..... Junior Lecturer
Coetsee, J., BCom(Hons)(Pretoria) ..... Junior Lecturer

Department of Insurance and Actuarial Science

Ströh, A., MSc PhD(Pretoria) ..... Professor (Acting Head)
Du Plessis, H.L.M., BSc(Witwatersrand) FIA FASSA ..... Associate Professor
Jansen van Rensburg, H., BSc(Hons)(Pretoria) ..... Junior Lecturer
Sauer, J.J.C., BCom(Hons)(Pretoria) FIA FASSA ..... Senior Lecturer
Venter, M., BSc(Hons)(RAU) BCom(Hons)(Cape Town) FFA FASSA..... Senior Lecturer

Department of Mathematics and Applied Mathematics

Lubuma, J.M-S., MSc PhD(Louvain, Belgium) ..... Professor (Head)
Delbaen, F.E., PhD(Free Univ Brussels) ..... Extraordinary Professor
Diestel, J., BS(Dayton) PhD(Cath Univ of America) ..... Extraordinary Professor
Rajagopal, K.R., PhD(Minnesota) ..... Extraordinary Professor
Sauer, N., MSc(Pretoria) PhD(Unisa) ..... Extraordinary Professor
Janse van Rensburg, N.F., BSc(Pretoria) BSc(Hons)(Unisa) MSc DSc(Pretoria) HED ..... Emeritus Professor
Rosinger, E.E., MSc Dr Sc(Bucharest) ..... Emeritus Professor
Schoeman, M.J., MSc(Pretoria) Dr Sc T Wet(Delft) M.Akad.SA..... Emeritus Professor
Engelbrecht, J.C., MSc(Pretoria) DSc(Potchefstroom) ..... Professor
Pretorius, L.M., MSc DSc(Pretoria) ..... Professor
Sango, M., MSc(Donetsk State Univ, Ukraine) PhD(Univ of Valenciennes, France) ..... Professor
Ströh, A., MSc PhD(Pretoria) ..... Professor
Swart, J., BSc(Hons) MSc(Potchefstroom) DrPhil(Zürich)..... Professor
Anguelov, R., MSc(Sofia) PhD(Unisa) ..... Associate Professor
Harding, A.F., MSc DSc(Pretoria) HNED..... Associate Professor
Maré, E., MSc(Witwatersrand) PhD(Free State)..... Associate Professor

Shatalov, M.Y., MSc(Moscow Lomonosov State Univ)
PhD(Russian Academy of Science) ..... Extraordinary Lecturer
Duvenhage, R. de V., MSc PhD(Pretoria) ..... Senior Lecturer
Jordaan, K.H., BSc(Hons)(Witwatersrand) MSc(Pretoria)
PhD(Witwatersrand) HED ..... Senior Lecturer
Le Roux, C., MSc(Cape Town) PhD(Pretoria) ..... Senior Lecturer
Möller, M.P., BSc(Hons)(Comp. Science) BSc(Hons)(Maths)
MSc(Pretoria) ..... Senior Lecturer
Mureithi, E.W., MSc(Kenyatta Univ)
PhD(Univ of New South Wales) ..... Senior Lecturer
Mutangadura, S.A., BSc(Hons) PhD(London) ..... Senior Lecturer
Ntumba, P.P., MSc PhD(Cape Town)
LPA(Institut Pedagogique Kinshasa) ..... Senior Lecturer
Beyers, F.J.C., BSc(Hons) MSc(Pretoria) ..... Lecturer
Dinga, Y.V., BSc HED(Fort Hare) BSc(Hons)(Rhodes)
MSc(Western Cape) ..... Lecturer
Djoko Kamdem, J., BSc(Hons) MSc(Cameroon)
PhD(Cape Town) ..... Lecturer
Kama, P., BSc(Hons) MSc(Fort Hare) ..... Lecturer
Kufakunesu, R., BSc(Hons) MSc(Zimbabwe) ..... Lecturer
Labuschagne, A., BSc(Hons) MSc(Potchefstroom)
PhD(Pretoria) DTE ..... Lecturer
Maepa, S.M., BSc(Hons)(University of the North) MSc(Lancaster)
PhD(Pretoria) STD(Setotolwane College of Educ.) ..... Lecturer
Mostert, L., BSc(Hons) MSc(Potchefstroom) ..... Lecturer
Van Zyl, A.J., BSc(Hons) MSc(Pretoria) ..... Lecturer
Verwey, A., BSc(Hons) MSc(Pretoria) ..... Lecturer
Yani, B.M., BSc(Vista) BSc(Hons)(Pretoria) ..... Junior Lecturer

BSc Four-year Programme
Smith, U.L., BSc MSc CCE(Utrecht) ..... Director
Naudé, K., BA BA(Hons)(Pretoria) MPhil(Stellenbosch) ..... Lecturer

Student Administration
Beresford, M.E., Mrs ..... Head: Student Administration
Kotze, S ..... Faculty Manager

GENERAL INFORMATION

Admission
Any person who wishes to register at the University for the first time, or after an interruption of studies, should apply or reapply for admission. Application for admission to all undergraduate programmes closes on 30 September.

Selection
A selection procedure takes place prior to admission to the following degree programmes in the Faculty of Natural and Agricultural Sciences:

(a) **All undergraduate programmes**

Note: BSc: Veterinary Biology:
A first-round selection process for the degree BSc: Veterinary Biology will take place at the end of the second year of study provided a candidate had passed all the prescribed modules. Students not selected at the end of the second year will be able to continue in their third year with any one of a number of different degree options including a three-year BSc degree with options in either Animal Science, Plant Science, Biotechnology, Entomology, Genetics, Microbiology, Zoology, or alternatively a four-year BSc(Agric) in Animal Science. It may, however, it may be necessary to register for additional outstanding prescribed modules.
A final selection of candidates who will be admitted to the BVSc programme will be made at the end of the third year in terms of General Regulations G.1.3, G.1.4 and G.62, based on academic merit, an interview and according to available capacity. Students not selected at the end of the third year of study or who do not wish to continue with the BVSc degree, will be able to apply for admission to continue with an honours degree in Anatomy, Physiology or an honours degree in one of the Biological or Agricultural Sciences programmes after completion of a number of specified additional third-year modules in that discipline.

(b) **Postgraduate programmes:**
BSc(Hons): Chemistry: Applications close on 30 November.
BSc(Hons): Mathematical Statistics: Admissions test compulsory for admission.
BSc(Hons): Wildlife Management: Applications close on 8 September.
MSc(Agric): Animal Science (all specialisations): Applications close on 30 October.
MInstAgrar: Animal Production Management: Applications close on 30 October.

Statement of symbols
When registering at this University for the first time, a candidate has to submit a record of symbols obtained for each subject in the Grade 12 examination.

National Senior Certificate
All undergraduate candidates who enrol at the University of Pretoria for the first time, must show their original National Senior Certificate at the Student Administration of their faculty before the end of the first semester.

Medium of instruction
In conducting its business, the University uses two official languages, namely Afrikaans and English. In formal education, the medium of instruction is either Afrikaans or English, or both of these languages, provided that there is a demand and that it is academically and economically justifiable. However, it remains the student's responsibility to ascertain

on an annual basis in which language a module and any further level of that module is presented. In respect of administrative and other services, a student has the right to choose whether the University should communicate with him or her in Afrikaans or English.

Bursaries and loans
Particulars of bursaries and loans are available on request.
Visit the website: www.up.ac.za/fao

Accommodation
Applications for accommodation in university residences for a particular year should be submitted as from March 1 of the preceding year. Applications will be considered as long as vacancies exist, and prospective students are advised to apply well in advance.
Please note that admission to the University does not automatically mean that lodging will also be available.

Welcoming day and academic orientation week
Details of the welcoming day to which all parents are cordially invited, and the subsequent academic orientation week during which all new first-year students **must** be present, are obtainable from the Dean of Students, University of Pretoria, Pretoria, 0002.

Prescribed books
Lists of prescribed books are not available. The appropriate lecturers will supply information regarding prescribed books to students at the commencement of lectures.

Amendment of regulations and fees
The University retains the right to amend the regulations and to change module fees without prior notification.
Please note: The fees advertised and thus levied in respect of a module or study programme presentation represents a combination of the costs associated with the formal services rendered (for example lectures, practicals, access to laboratories, consumables used in laboratories, etc) as well as associated indirect overheads such as the provision of library and recreation facilities, security and cleaning services, electricity and water supply, etc. Therefore the fees in respect of a module or study programme presentation cannot simply be reconciled with the visible services that are rendered in respect of such module or study programme.

NB: The University of Pretoria started phasing in a new system of education and learning during 2000, which meets the requirements set out in the SAQA guidelines (South African Qualifications Authority) and in the NQF (National Qualification Framework). This entails the implementation of training programmes that will be outcomes-based and market-orientated. This system was implemented in the Faculty during 2001.

Presentation of a module or a programme
The Faculty reserves the right not to offer a particular module or programme if there is insufficient resources to do so, or if an insufficient number of qualified students present themselves.

Definition of terms

Familiarise yourself with the following terms. They are used generally in all faculties.

academic year: the duration of the academic year which is determined by the University Council
core module: a compulsory module for a specific study programme or package
module code: consists of an equal number of capitals and digits, which indicate the name of the module, the year of study, the period of study and the level of the module
credits: a number of credits are allocated to each module. These represent the quantity of work and the extent of the module
curriculum: a series of modules grouped together from different subjects over a specified period of time and in a certain sequence according to the regulations
elective module: a module that forms part of a study programme and which may be chosen by the students on condition that sufficient module credits on a specific level is obtained, as is required for the qualification for which the student is registered
examination mark: the mark a student obtains for an examination in a module, including practical and clinical examinations where applicable. If necessary, the examination mark is finalised after ancillary examinations have been completed
extended study programme: a study programme for a degree or diploma which is completed according to the regulations over a longer period than the minimum duration of the particular degree or diploma
final mark: the mark calculated on the basis of the semester/year mark and the examination mark a student obtained in a particular module according to a formula which is determined from time to time in the regulations for each module with the proviso that should no semester/year mark be required in a module, the examination mark serves as the final mark
fundamental module: a module that is regarded as the academic basis of the learning activities in a specific programme or package
GS: a combined mark (semester/year mark plus examination mark) of at least 40% required for admission to a specific prescribed module
level of a module or **year level**: the academic level of a module which is indicated in the module code: this is an indication of the complexity of a module; the year level is indicated by the first digit of the module code (thus, PHY 131 is a module in Physics at level 1)
learning hours: This refers to the notional number of hours students should spend to master the learning content of a particular module or programme. The total number of learning hours for a module consists of the time needed for lectures, practicals, self-study and any other activity required by the training programme. Learning hours for modules are calculated on the basis of 40 working hours per week x 28 weeks = 1120 + 80 additional hours for evaluation = 1200. For undergraduate modules, the total number of learning hours per module are calculated using the formula number of credits (per module) x 10.
module: a defined part of a subject deemed to be an independent learning unit to which a module code is being allocated; a module is normally offered over seven weeks (quarter module).
registration: the process a candidate is required to complete to be admitted as a student of the University or for admission to a module
regulation for admission: a regulation drawn up by the Dean of a faculty regarding the admission of students to the faculty. It includes a provision regarding the selection process

semester module: a module that extends over one semester
semester/year mark: the mark a student obtains during the course of a semester or a year for tests, class-work, practical work or any other work in a particular module as approved by regulation
subject: a demarcated field of study of which one module or more may be chosen for a study programme
syllabus: the division of the study material for a specific module, according to the regulations
weighted average: the weighted average is composed of the marks for the various modules, weighted with the credits of each module as a fraction of the total number of credits for the semester or year
year module: a module that extends over one year (two semesters)

REGULATIONS AND CURRICULA

The rules for degrees, diplomas and certificates here published are subject to change and may be amended prior to the commencement of the academic year in 2009.

1. **Admission to undergraduate study**

1.1 **General**

(a) To register for a first bachelor's degree at the University, a candidate must, in addition to the required National Senior Certificate with admission for degree purposes, comply with the specific admission requirements for particular modules and fields of study as prescribed in the admission regulations and the faculty regulations.
(b) Candidates are advised to write the admissions test of the University of Pretoria.
(c) Applicants are notified in writing of provisional admission. Admission to the Faculty of Natural and Agricultural Sciences is based on the final grade 12 examination results. In the case of the BSc: Four Year Programme candidates may be considered for admission based on the final grade 12 examination results and the results of the compulsory admissions test.
(d) The following persons may also be considered for admission:
    (i) A candidate who is in possession of a certificate that is deemed by the University to be equivalent to the required National Senior Certificate with admission for degree purposes.
    (ii) A candidate who is a graduate from another tertiary institution or has been granted the status of a graduate of such an institution.
    (iii) A candidate who passes an entrance examination, as prescribed by the University from time to time.

    Abovementioned candidates are requested to contact the Student Administration at the faculty for more information regarding admission requirements.
    Note: A conditional exemption certificate does not grant admission to bachelor's study. However, in certain circumstances some of the faculties do accept a conditional exemption on the basis of mature age. Candidates are advised to contact the specific faculty administration in this regard.
(e) The Senate may limit the number of students allowed to register for a module, in which case the Dean concerned may, at his own discretion, select from the students who qualify for admission those who may be admitted.

(f) Subject to faculty regulations and the stipulations of General Regulations G.1.3 and G.62, a candidate will only be admitted to postgraduate bachelor's degree studies, if he or she is already in possession of a recognised bachelor's degree.

(g) **Admission requirements for the Faculty of Natural and Agricultural Sciences for candidates with a National Senior Certificate from 2009:**
To be able to gain access to the Faculty and specific programmes prospective students require the appropriate combinations of recognised NSC subjects as well as certain levels of achievement in the said subjects. In this regard the determination of an admission point score (APS) is explained and a summary of the specific requirements, i.e. the APS and the specific subjects required is provided.

Determination of an Admission Point Score (APS)
The calculation is simple and based on a candidate's achievement in six 20-credit recognised subjects by using the NSC ratings, that is the "1 to 7 scale of achievement". Thus, the highest APS that can be achieved is 42.

Life Orientation is excluded from the calculation determining the APS required for admission per faculty.

Rating code	Rating	Marks %
7	Outstanding achievement	80-100%
6	Meritorious achievement	70-79%
5	Substantial achievement	60-69%
4	Adequate achievement	50-59%
3	Moderate achievement	40-49%
2	Elementary achievement	30-39%
1	Not achieved	0-29%

Preliminary admission is based on the results obtained in the final Grade 11 examination. Final admission is based on Grade 12 results. Please note: The final Grade 12 results will be the determining factor with regard to admission.
Alternative admission channels:
Candidates with an APS lower than required, could be considered for admission to the faculty if they meet the additional assessment criteria specified by the faculty from time to time. Preference will, however, be given to students who comply with the regular admission requirements of the faculty.

Specific requirements for the Faculty of Natural and Agricultural Sciences from 2009
1. A valid National Senior Certificate with admission for degree purposes.
2. It is recommended that all applicants write the UP Admissions Test.
3. The following minimum subject and level requirements:

<table>
<tr><th rowspan="2">Degree</th><th rowspan="2">APS</th><th colspan="3">Group A</th><th colspan="2">Group B</th></tr>
<tr><th>Two Languages</th><th>Mathematics</th><th>Life Orientation</th><th>Physical Science</th><th>2 Other subjects</th></tr>
<tr><td rowspan="2">BSc Biological Sciences (All the degrees including Medical Science, Soil Science and Veterinary Biology)</td><td>30</td><td>Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4(50-59%).</td><td>4 (50-59%)</td><td>4 (50-59%) (Excluded when calculating the APS)</td><td>4 (50-59%)</td><td>Any two subjects</td></tr>
<tr><td colspan="6">There are only 72 places in the first year of BSc Medical Sciences. Students who apply for Medical Sciences as their first choice before 30 September wil be admitted until the places have been filled. Students who indicate it as their second choice will be placed on a waiting list and will be considered in January of the first year of study, if places become available.

Selection to the third year of BSc: Veterinary Biology takes place after completion of all the prescribed modules of the first two years of study and after the completed second year of study.

Students who do not comply with these entrance requirements and who wrote the admissions test may be considered for the BSc: Four Year programme.</td></tr>
<tr><td rowspan="2">BSc Physical Sciences (Geography, Geology, Environment and Engineering Geology, Meteorology, Environmental Science, Chemistry, Exploration Geophysics, Physics, Geoinformatics)</td><td>30</td><td>Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).</td><td>5 (60-69%)</td><td>4 (50-59%) (Excluded when calculating the APS)</td><td>4 (50-59%)</td><td>Any two subjects</td></tr>
<tr><td colspan="6">Students who do not comply with these entrance requirements and who wrote the admissions test may be considered for the BSc: Four-year programme.</td></tr>
</table>

Degree	APS	Group A			Group B
		Two Languages	Mathematics	Life Orientation	Three subjects
BConsumer Science	24	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	4 (50-59%)	4 (50-59%) (Excluded when calculating the APS)	Any 3 subjects
BConsumer Science (Ed)	24	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	4 (50-59%)	4 (50-59%) (Excluded when calculating the APS)	Any 3 subjects
BSc Mathematical Sciences (Applied Mathematics, Mathematics, Mathematical Statistics)	30	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	5 (60-69%)	4 (50-59%) (Excluded when calculating the APS)	Any 3 subjects
	Students who do not comply with these entrance requirements and who wrote the admissions test may be considered for the BSc: Four-year programme.				
BSc Mathematical Sciences (Actuarial and Financial Mathematics)	30	Comply with NSC minimum require-ments; ADDI-TIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	6 (70-79%)	4 (50-59%) (Excluded when calculating the APS)	Any 3 subjects
	Students who do not comply with the entrance requirements of the BSc: Actuarial and Financial Mathematics and who wrote the admissions test may be considered for the BSc: Mathematical Statistics or the BSc: Four-year programme.				

Degree	APS	Group A			Group B	
		Two Languages	**Mathematics**	**Life Orientation**	**Physical Science**	**2 Other subjects**
BSc(Agric)	30	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	4 (50-59%)	4 (50-59%) (Excluded when calculating the APS)	4 (50-59%)	Any two subjects
	Students who do not comply with these entrance requirements and who wrote the admissions test may be considered for the BSc: Four-year programme with a view to apply to transfer to BSc(Agric) programmes after successful completion of the first year of the first year of the BSc: Four-year programme.					
BSecEd(Sci)	30	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	5 (60-69%)	4 (50-59%) (Excluded when calculating the APS)	4 (50-59%)	Any two subjects
	Students who do not comply with these entrance requirements and who wrote the admissions test may be considered for the BSc: Four-year programme with a view to apply to transfer to BSecEd(Sci) programmes after successful completion of the first year of the first year of the BSc: Four-year programme.					
BSc Four-year Programme (Veterinary Biology) **Admissions test compulsory**	22	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	4 (50-59%) **or** 3 (40-49%) **provided a 4** symbol is obtained for Physical Science	4 (50-59%) (Excluded when calculating the APS)	4 (50-59%) **or** 3 (40-49%) **provided a 4** symbol is obtained for Mathematics	Any two subjects
BSc Four-year programme (Biological and Agricultural Sciences) **Admissions test compulsory**	22	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	4 (50-59%) **or** 3 (40-49%) **provided a 4** symbol is obtained for Physical Science	4 (50-59%) (Excluded when calculating the APS)	4 (50-59%) **or** 3 (40-49%) **provided a 4** symbol is obtained for Mathematics	Any two subjects

BSc Four-year programme (Physical Sciences) **Admissions test compulsory**	22	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	4 (50-59%) **or** 3 (40-49%) **provided a 4** symbol is obtained for Physical Science	4 (50-59%) (Excluded when calculating the APS)	4 (50-59%) **or** 3 (40-49%) **provided a 4** symbol is obtained for Mathematics	Any two subjects

Degree	**APS**	**Group A**		**Group B**	
		Two Languages	**Mathematics**	**Life Orientation**	**Three subjects**
BSc Four-year programme (Mathematical Sciences) **Admissions test compulsory**	22	Comply with NSC minimum requirements; ADDITIONALLY one of these languages must be Afrikaans OR English at level 4 (50-59%).	4 (50-59%)	4 (50-59%) (Excluded when calculating the APS)	Any three subjects

1.2 **Requirements for specific modules**

A candidate who:

(a) passed the Grade 12 examination in Mathematics with at least 60% will be admitted to the modules GLY 151, 152, 161 and 162 in Geology;

(b) passed the Grade 12 examination in Mathematics with at least 50%, will be admitted to WTW 134, WTW 115, WTW 152, WTW 161, and WTW 126 and 60% for WTW114 and WTW 158 in Mathematics, and to WST 111 in Mathematical Statistics (For the programme in Actuarial and Financial Mathematics, 70% in Mathematics is required)

(c) passed the Grade 12 examination in Mathematics as well as in Physical Science with at least 50%, will be admitted to Molecular and Cell Biology and a module in the subjects Zoology and Entomology, Genetics, Microbiology or Plant Science;

(d) passed the Grade 12 examination in Mathematics with at least 50%, or obtained at least 50% in STK 113 and 123 will be admitted to BME 120;

(e) passed the Grade 12 examination in Mathematics and Physical Science with at least 50%, will be admitted to the module CMY 117, 127 and 151 in Chemistry and PHY 131 and 171 in Physics;

(f) obtained at least 60% in Accounting on higher grade in the Grade 12 examination, may enroll immediately for INF 181, a module covering computer applications in accounting and offered for the duration of the first semester (14 weeks). All other students who have obtained at least 40% in FRK 111, must enroll for INF 181 in the second semester (14 weeks).

(g) obtained at least 50% for Mathematics obtains admission to the module COS 130;

(h) obtained at least 50% in Grade 12 Mathematics will be admitted to STK 110. Candidates who do not qualify for STK 110 must enrol for STK 113 and STK 123.

Please note:

(i) ……the Grade 12 examination… refers to the final National Senior Certificate examination.

(ii) A student who takes a module presented by another faculty must take note of the admission requirements of that module, subminimum required in examination papers, supplementary examinations, etc.

2. **Registration for a particular year of study**

At the beginning of an academic year, a student registers for all the modules he or she intends taking in that particular year (whether these be first-semester, second-semester or year modules). Changes to the chosen field of study may be made at the beginning of the second semester/third quarter with the Dean's approval. A student may also only register for modules that will fit in on the lecture, test and examination timetables. Should a student be prepared to attend one module after hours to avoid clashes on the timetables, the approval of the Dean is not required. (This will only be possible if the module in question is offered full-time and extramurally). A student is allowed to register for the next year of study only if at least the equivalent of four semester modules have been passed in a particular year of study.

2.1 **Extended Programmes:**

BSc: Four-year Programme: Mathematical Sciences (02130007)
BSc: Four-year Programme: Biological and Agricultural Sciences (02130008)
BSc: Four-year Programme: Veterinary Biology (02130009)
BSc: Four-year Programme: Physical Sciences (02130010)

(a) These programmes are followed by students who, as a result of exceptional circumstances, will benefit from an extended programme.

(b) Students who wish to follow one of the BSc Four-year Programmes will be subjected to an admissions test and will be considered for admission by the Admissions Committee.

(c) Applications for admission to the BSc Four-year Programme should be submitted before 30 September each year. Details are obtainable from the Student Administration at the Faculty of Natural and Agricultural Sciences.

(d) The rules and regulations applicable to the normal study programmes apply *mutatis mutandis* to the BSc Four-year Programmes, with exceptions as indicated in the regulations pertaining to the BSc Four-year Programmes.

(e) Students who are admitted to one of the BSc Four-year Programmes register for one specific Programme.

3. **Module credits for unregistered students**

There are students who attend lectures, write tests and examinations and in this manner earn "marks", but have either not registered for modules or even as students at all. These marks will not be communicated to any student before he/she has provided proof of registration. A student cannot obtain any credits in a specific academic year for a module "passed" in this manner during a previous academic year and for which he/she was not registered. This arrangement applies even where the student is prepared to pay the tuition fees.

4. **Examination admission and pass requirements**

Students who are registered for a module in this faculty are entitled to write the examination in that module. A final mark of at least 50% is required to pass the module.

4.1 **Subminima in examinations**

A subminimum of 40% is required in the examination in each module. The year or semester mark of a module is obtained through continuous assessment of a student's performance during the module. A student must satisfactorily complete the practical component of the module (if applicable). The method by which the year/semester mark will be obtained, is published in the study guide of the module.

4.2 **Examinations**

The examinations for first-semester modules and the first- and second-quarter modules take place in May/June, while all other examinations (second-semester modules, third- and fourth-quarter modules and year modules) take place in October/November.

The final mark for the module is a combination of the year or semester mark and the examination mark, with the proviso that a module can only be passed if a subminimum of 40% is obtained in the examination and the practical component (if applicable) of the module has been satisfactorily completed. A final mark of at least 50% is required to pass a module. The year or semester mark must fall within a range of 40%-60% and the examination mark must fall within a range of 40%-60% of the final mark. Deviations from this rule can be approved by the Dean. The formula that is used to determine the final mark will be specified in the study guide of the module.

4.3 **Ancillary examinations**

After completion of an examination and before the examination results are published, the examiners may decide to summon a student for an ancillary examination on particular aspects of the work in that module with a view to determining:

- whether a candidate who does not comply with the requirements to pass a module could achieve a final pass mark; or
- whether a candidate, who does not comply with the requirements for a pass with distinction, will be able to improve his or her final mark.

It is, therefore, possible that, depending on the importance a lecturer attaches to continuous evaluation, no supplementary examinations may be awarded in a certain module. If ancillary examinations are awarded in a module, the guidelines indicating the basis for such consideration, have to be published in the study guide of the module.

4.4 **Re-marking of examination papers (also consult Reg G.14)**

After an examination, departments give feedback to students about the framework that was used by the examiners during the examination. The way in which feedback is given, is determined by the departmental heads. Students may apply for re-marking of an examination paper after perusal and within 14 calendar days after commencement of lectures in the next semester. The prescribed fee has to be paid. The paper will then be re-marked by an examiner appointed by the head of the department.

4.5 **Supplementary examinations**

(a) Supplementary examinations in first-semester modules take place after the May/June examinations, while those in second-semester and year modules take place after the October/November examinations.

(b) To pass a supplementary examination, a student must obtain a minimum of 50%.

(c) The highest final percentage a student can obtain in a supplementary examination is 50%.

(d) Special supplementary examinations are not arranged for students who are unable to write the examinations at the times and venues scheduled for supplementary examinations. (Also consult Reg.G.12)

4.6 **Computer and information literacy** (CIL 111, CIL 121)
It is a requirement for all new first-year students to register for two modules in Computer and Information Literacy. Students may write an exemption test for CIL 111 (Computer Literacy) only.

4.7 **Academic literacy** (EOT 110 and EOT 120)
All new first-year students are required to write a language profiency test. Based on the results of the test, a student will be enrolled in language development modules that have to be passed before the degree will be awarded. All students who pass the Academic Literacy Test have to enrol for modules of equal value to make up the credits from the following: FIL 110, FIL 155 or other language modules: AFT 110, AFR 110, ENG 110, ENG 120, EOT 161, EOT 162, EOT 164, NDE 110, SEP 110, STW 110, ZUL 110, SCI 154, SCI 164 or MTL 181.

DEGREES AND DIPLOMAS CONFERRED/AWARDED IN THE FACULTY

The following degrees and diplomas are presented in the Faculty (minimum period of study is given in brackets):

(a) **Bachelor's degrees:**
- (i) Baccalaureus Scientiae – BSc (3 years)
- (ii) Baccalaureus Scientiae Agriculturae –– BSc(Agric) (4 years)
- (iii) Baccalaureus Secundae Educationis (Scientiae) – BSecEd(Sci) (4 years)
- (iv) Baccalaureus in Consumer Science – BConsSc (4 years)

(b) **Honours degrees: (1 year)**
- (i) Baccalaureus Scientiae Honores – BSc(Hons)
- (ii) Baccalaureus Institutionis Agrariae Honores – BInstAgrar(Hons)

(c) **Master's degrees: (minimum 1 year)**
- (i) Magister Scientiae – MSc
- (ii) Magister Scientiae Agriculturae – MSc(Agric)
- (iii) Magister Institutionis Agrariae – MInstAgrar
- (iv) Magister in Consumer Science – MConsSc

(d) **Doctoral degrees:**
- (i) Philosophiae Doctor – PhD (minimum 1 year)
- (ii) Doctor Scientiae – DSc

(e) **Diplomas:**
- (i) Advanced University Diploma in Extension and Rural Development – (1 year)

BACHELOR'S DEGREES

GENERAL INFORMATION FOR DEGREES IN THE FACULTY

General Regulations G.1 to G.15 are applicable to a bachelor's degree.

Sc.1 Duration

- **BSc**

The minimum duration of study is three years full-time study.

- **BSc(Agric), BConsSc, BSecEd(Sci), BSc: Food Science**

The minimum duration of study is four years full-time study.

Sc.3 Study programmes

The curricula are compiled from the study programmes in Sc. 7 or an alternative study programme as approved by the Dean.

Sc.4 Compilation of the curriculum

- **BSc**

A student must obtain at least 440 module credits to comply with the requirements for a BSc degree programme. At least 144 credits must be obtained at 300/400 level, or otherwise indicated by programme syllabi. The minimum module credits needed to comply with degree requirements is set out at the end of each study programme. A maximum of 176 credits will be recognised at 100 level. A student may, in consultation with the Dean, follow modules not indicated in BSc three-year study programmes to the equivalent of a maximum of 36 module credits. The credits allocated per quarter/semester/year to each elective module should be regarded as a guideline only and not as an instruction. It is, however, important that the total number of prescribed elective module credits are completed during the course of the study programme. The Dean may, on the recommendation of the head of department, approve deviations in this regard.
A student may not register for more than 110 module credits per semester, unless it is with the permission of the Dean.
Students who are already in possession of a bachelor's degree, will not receive credit for more than half the credits passed previously for that degree. No credits at the final year or 300- and 400 level will be approved.

- **BSc: Medical Science**

As from 2004 the BSc(MedSci) degree is presented in this Faculty.

NB: Due to the limited facilities, only 72 students can be admitted. Only candidates who have applied for admission by 30 September and who indicated this programme as a first choice, are provisionally admitted pending Gr.12 final results.

Promotion requirements:
A student will be promoted to the following year of study if less than 50 credits need to be carried over, unless the Dean on the recommendation of the head of department decides otherwise. A student who does not comply with the requirements for promotion to the following year of study, retains the credit for the modules already passed and may be admitted by the Dean, on recommendation of the head of department, to modules of the following year of study to a

maximum of 50 credits, provided that it will fit in with both the lecture and examination timetable.

- **BSc(Agric)**

The minimum toral of credits needed to comply with degree requirements is set out at the end of each study programme.
Students must register for elective modules in consultation with the head of department who must ensure that the modules do not clash on the set time table.
The Dean may, in exceptional cases and on recommendation of the head of department, approve deviations from the prescribed curriculum.
Promotion requirements:
A student will be promoted to the following year of study if less than 50 credits need to be carried over, unless the Dean on the recommendation of the head of department decides otherwise. A student who does not comply with the requirements for promotion to the following year of study, retains the credit for the modules already passed and may be admitted by the Dean, on recommendation of the head of department, to modules of the following year of study to a maximum of 50 credits, provided that it will fit in with both the lecture and examination timetable.

- **BConsSc**

Promotion requirements:
All the degrees in Consumer Science
A student who did not pass all the prescribed modules of a particular year of study, has to register for the outstanding modules first. With the approval of the head of the department, modules of the following year of study may be taken in advance only if no timetable clashes occur; all the requirements and prerequisites have been met and not more than a specified number of credits per semester are taken. The credits of the semester of which modules are repeated, are taken as a guideline for the calculation of the number of modules permitted.

a. A student registers for the second year when at least 80% of the first-year module credits have been passed.
b. A student registers for the third year when at least 85% of the module credits of the previous years have been passed.
c. A student registers for the fourth year when at least 95% of the module credits of the previous years have been passed.

- **BSecEd(Sci)**

See Sc.7.2

- **BSc: Four-year Programmes**

Four extended programmes are available: BSc: Four-year Programme: Mathematical Sciences (02130007), BSc: Four-year Programme: Biological and Agricultural Sciences (02130004), BSc: Four-year Programme: Veterinary Sciences (02130009) as well BSc: Four-year Programme: Physical Sciences (02130010).
Students who do not comply with the normal three-year BSc entrance requirements for study in the Faculty of Natural and Agricultural Sciences, may nevertheless be admitted to the Faculty by being placed on the BSc: Four-year Programme. Generally the BSc: Four-year Programme means that first study year in Mathematics, Physics and Chemistry is extended to take two years. Bridging modules in Biology and life skills are also available. After completing the BSc:

Four-year Programme successfully, students join the second year of the normal BSc programme to complete their degrees. The possibility of switching over to other faculties such as Engineering, Built Environment and Information Technology and Health Sciences, after one or two years in the Extended Programme, exists. This depends on selection rules and other conditions stipulated by the other faculties.

Applications for admission to the BSc: Four-year Programme must be submitted annually before 30 September. All students considered for the BSc: Four-year Programme must have written an admissions test. Information in this regard is available at the Client Services Centre. In addition all rules and regulations applicable to the normal study programmes, apply *mutatis mutandis* to the BSc: Four-year Programme, with exceptions stated in the regulations for the BSc: Four-year Programme. For instance, students placed in the BSc: Four-year Programme must have a National Senior Certificate with admission for degree purposes.

An admissions committee considers applications for the BSc: Four Year Programme annually. Regarding subject choices, admitted students are individually placed on the BSc: Four Year Programme according to their prospective field of study. Students may NOT change this placement without the permission of the Chairperson of the admissions committee.

Syllabus
The following available modules as indicated below, are prescribed modules for a BSc: Four-year Programme and the equivalence to the first-year modules of the normal BSc programme:
Prescribed: CMY133 Chemistry 133, CMY143 Chemistry 143 and CMY154 Chemistry 154: Equivalent module – a BSc First-semester prescribed module: CMY117.
Prescribed: PHY133 Physics 133, PHY143 Physics 143 and PHY153 Physics 153: Equivalent module – a BSc First-semester prescribed module: PHY131 or a section of the BSc year module Physics PHY 171.
(NB! PHY133, PHY143, PHY154 and FSK 126 must be passed to be credited for or exempted from PHY171 as a 32 credits module toward a BSc where the year module is prescribed).
Prescribed: WTW133 Mathematics 133, WTW143 Mathematics 143 and WTW153 Mathematics 153: Equivalent module – a BSc First-semester prescribed module: WTW114.
Prescribed: MLB133 Molecular and Cell Biology 133, MLB143 Molecular and Cell Biology, MLB153 Molecular and Cell Biology 153: Equivalent module – a BSc First-semester prescribed module: MLB111 Molecular and Cell Biology 111.

NB! Students may register for an extended module (PHY133, PHY143 and PHY153 module codes) only once.

Compulsory modules:
CIL111 and CIL121. Computer and information literacy modules, 4 + 4 credits.
LST 133 and LST 143. Academic literacy, 6 + 6 credits.

All new students must register for the academic literacy modules LST, except if they passed the compulsory academic literacy test, in which case they may select other modules from the list below to make up the 12 credits.

FIL 110, FIL 155 or other language modules: AFT 110, AFR 110, ENG 110, ENG 120, EOT 161, EOT 162, EOT 164, SEP 110, STW 110, ZUL 110, SCI 154, SCI 164 or MTL 181.

Promotion requirements

General

(a) Students whose academic progress is not acceptable can be suspended from further studies.

Specific relevant to BSc: Four-year Programmes:

(b) A student who is excluded from further studies in terms of the stipulations of the above-mentioned regulations, will be notified in writing by the Dean or Admissions Committee at the end of the relevant semester.

(c) A student who has been excluded from further studies may apply in writing to the Admissions Committee of the Faculty of Natural and Agricultural Sciences for re-admission.

(d) Should the student be re-admitted by the Admissions Committee, strict conditions will be set which the student must comply with in order to proceed with his/her studies.

(e) Should the student not be re-admitted to further studies by the Admissions Committee, he/she will be informed in writing.

(f) Students who are not re-admitted by the Admissions Committee have the right to appeal to the Senior Appeals Committee.

(g) Any decision taken by the Senior Appeals Committee is final.

Specific

(a) **BSc: Four-year Programme**: It is expected from students accepted into the BSc: Four-year Programme to finish a complete corresponding BSc first year within the two years of enrolment in the BSc: Four-year Programme. Students who do not show progress during the first semester of the first year will be referred to the Admissions Committee of the Faculty. Students registered for the first year of BSc: Four-year Programme are expected to pass all prescribed modules of the first year of the programme. Failing to achieve this will lead to reconsideration of their admission by the Admissions Committee. Re-admission will depend strongly on the student's ability to cope successfully with the science core modules.

Sc.5 Special examinations in the Faculty of Natural and Agricultural Sciences

A student who requires a maximum of two modules and not more than 36 credits outstanding to comply with all the requirements for the degree, may be admitted by the Dean, on the recommendation of the head of department, to special examinations in modules failed, provided that this will enable him or her to comply with all the degree requirements. A student who has obtained a final mark of less than 40% in any one of the relevant modules, or who has previously been admitted to a special examination, does not qualify for this concession.

Sc.6 Degree with distinction

- **BSc**

  A student obtains his or her degree with distinction if all prescribed modules at 300 level (or higher) are passed in one academic year with a weighted average of at least 75%, and obtain at least a subminimum of 65% in each of the relevant modules.

- **BSc(Food Management)**
  A student obtains his or her degree with distinction if a weighted average of at least 75% is obtained in the following modules:
  Marketing Management 781
  Foods 413, 423
  Food Service Management 410, 411
  Food Science and Technology 411

- **BSc(Agric)**
  The BSc(Agric) degree is conferred with distinction if a student obtains a weighted average of at least 75% in the modules of the major subjects in the third and the fourth year of study, with a weighted average of at least 65% in the other modules of the third and the fourth year of study.

- **BConsSc**
  A student obtains his or her degree with distinction if a weighted average of at least 75% is obtained in the following modules:

  (i) **Clothing:**
  Clothing Retail Management:
  A combination equivalent to six semester modules
  Marketing Management 311 and 321
  Clothing 410 and 420
  Clothing Production 321, 411
  Project: Clothing Textile Project 402
  Textiles 421

  (ii) **Food Management:**
  Food Retail Management:
  A combination equivalent to six semester modules:
  Marketing Management 311 and 321
  Food Service Management 410
  Foods 310, 354, 322, 413, 415, 423, 425, 426
  Hospitality Management:
  A combination equivalent to six semester modules
  Tourism Management 310
  Business Management 311
  Project Hospitality Management 410, 420
  Foods 322, 413, 414, 424
  Food Service Management 410

  (iii) **Interior Merchandise Management:**
  Interior Retail Management:
  A combination equivalent to six semester modules:
  Marketing Management 311 and 321
  Interior Planning 322, 410
  Interior Production 310
  Interior Merchandise 311
  Interior Project 481
  Consumer Facilitation 411

(iv) **Ed:**

Consumer Studies:

The degree is conferred with distinction on a student who obtains a weighted average of at least 75% in the following modules:
Subject Didactics: Consumer Studies 400
Professional Portfolio 400
Interior Merchandise 311
Interior Planning 320
Nutrition 321
Foods 322

Hospitality Studies:

The degree is conferred with distinction on a student who obtains a weighted average of at least 75% in the following modules:
Subject Didactics: Hospitality Studies 400
Professional Portfolio 400
and any other four of the following:
Food Service Management 321
Nutrition 311
Foods 322
Foods 414
Foods 424
Tourism Management 310

- **BSecEd(Sci)**
  See Sc.7.2

Sc.7 STUDY PROGRAMMES

The curriculum is composed of one of the following study programmes. The Dean may, on the recommendation of the programme manager, approve deviations in this regard.

Sc.7.1 GENERAL INFORMATION

(i) Study programmes in the Department of Geology: Students will be informed timeously of compulsory excursions that could take place during the vacations. The attendance of excursions for first-year students is compulsory, while excursions of longer duration are compulsory for senior students.

(ii) Where elective modules are not specified, these may be chosen from any modules appearing in the Syllabus.

(iii) **List of codes**

Dept = Department in which the modules is offered

Faculty of Natural and Agricultural Sciences

BCM = Department of Biochemistry
BOT = Department of Plant Science
CMY = Department of Chemistry
FLG = Department of Physiology
FSK = Department of Physics
GGY = Department of Geography, Geoinformatics and Meteorology
GLY = Department of Geology
GTS = Department of Genetics
LEK = Department of Agricultural Economics, Extension and Rural Development
MBY = Department of Microbiology and Plant Pathology
PGW = Department of Plant Production and Soil Science
SCE = Physics
SCI = Physics
VBR = Department of Consumer Science
VDW = Department of Food Science
VKU = Department of Animal and Wildlife Sciences
VWT = Department of Insurance and Actuarial Sciences
WST = Department of Mathematical Statistics
WTW = Department of Mathematics and Applied Mathematics
ZEN = Department of Zoology and Entomology

Faculty of Economic and Management Sciences

BDO = Department of Human Resource Management
BEM = Department of Marketing and Communication Management
EKN = Department of Economics
FRK = Department of Accounting and Financial Management
INF = Department of Informatics
OBS = Department of Business Management
TBE = Department of Tourism Management

Faculty of Humanities

EOT = Unit for Academic Literacy

VKK = Department of Visual Arts
MTL = Department of Ancient Languages
KGK = Department of Visual Arts
SLK = Department of Psychology
SOC = Department of Sociology

Faculty of Engineering, Built Enviroment and Information Technology

COS = Department of Computer Science

Faculty of Health Sciences

ANA = Department of Anatomy
FAR = Department of Pharmacology

Faculty of Veterinary Sciences

ANA = Department of Anatomy and Physiology
PAS = Department of Production Animal Studies

lpw/ppw: lectures per week/ practicals per week (e.g.: 3+1 = 3 lectures and 1 practical per week)
Quarter: The quarter in which the specific module is presented.
J1 = the whole year (year module: extends over two semesters)
S1 = the first semester (K1 + K2)
S2 = the second semester (K3 + K4)
K1 = first quarter
K2 = second quarter
K3 = third quarter
K4 = fourth quarter

Credits: Credit value of a module.

: Module must be taken before or together with the module for which it is a prerequisite.

TDH: Approval from the head of department is required to register for the module.

Par 1.2: Refers to the admission requirements for specific modules that appear at the beginning of this publication.

Field of study	Dept	Code
BSc Actuarial & Financial Mathematics	VWT	02133388

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
COS130	INTRODUCT._TO_PROGRAMMING_130 Prerequisite/s: [Par 1.2]	S1	4	1	16
EKN113	ECONOMICS_113 Prerequisite/s: [Par 1.2]	S1	3	0	15
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FBS110	FINANCIAL_MANAGEMENT_110 Prerequisite/s: [Par 1.2]	S1	3	0	10

WST111	MATHEMATICAL_STATISTICS_111 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			22/22	3/3	41.5/41.5

Students who passed Computer studies at grade 12-level, may be exempted from COS130.

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EKN123	ECONOMICS_123 Prerequisite/s: [EKN113 GS] and [Par 1.2]	S2	3	0	15
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
FBS120	FINANCIAL_MANAGEMENT_120 Prerequisite/s: [Par 1.2]	S2	3	0	10
WST121	MATHEMATICAL_STATISTICS_121 Prerequisite/s: [WST111 GS]	S2	4	1	16
WTW123	NUMERICAL_ANALYSIS_123 Prerequisite/s: [WTW114 GS]	S2	2	1	8
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37.5/37.5

Compulsory credits = (158) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
IAS211	ACTUARIAL_MATHEMATICS_211 Prerequisite/s: [WTW114 60%] and [WTW128 60%]	S1	2	1	12
INF214	INFORMATICS_214 Prerequisite/s: [CIL111] and [CIL121]	S1	3	2	14
WST211	MATHEMATICAL_STATISTICS_211 Prerequisite/s: [WST111] and [WST121] and [WTW114 GS] and [WTW126 GS] and [WTW128 GS]	S1	4	2	24
WTW211	LINEAR_ALGEBRA_211 Prerequisite/s: [WTW126]	S1	2	1	12
WTW218	CALCULUS_218 Prerequisite/s: [WTW114] and [WTW128]	S1	2	1	12
Totals for compulsory modules in the first/second terms			13/13	7/7	37/37

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
IAS221	ACTUARIAL_MATHEMATICS_221 Prerequisite/s: [IAS211 GS]	S2	2	1	12
WST221	MATHEMATICAL_STATISTICS_221 Prerequisite/s: [WST211 GS]	S2	4	2	24
WTW220	ANALYSIS_220 Prerequisite/s: [WTW114] and [WTW128]	S2	2	1	12
WTW221	LINEAR_ALGEBRA_221 Prerequisite/s: [WTW211]	S2	2	1	12
WTW286	DIFFERENTIAL_EQUATIONS_286 Prerequisite/s: [WTW114] and [WTW126] and [WTW128]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			12/12	6/6	36/36

Elective: IAS282.
Compulsory credits = (146) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
WST311	MULTIVARIATE_ANALYSIS_311 Prerequisite/s: [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]	S1	2	1	18
WTW310	ANALYSIS_310 Prerequisite/s: [WTW220]	S1	2	1	18
WTW354	FINANCIAL_ENGINEERING_354 Prerequisite/s: [WST211] and [WTW211] and [WTW218]	S1	2	1	18
Totals for compulsory modules in the first/second terms			6/6	3/3	27/27

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
WST321	TIME_SERIES_ANALYSIS_321 Prerequisite/s: [WST211] and [WST221] and [WST311 GS] and [WTW211 GS] and [WTW218 GS]	S2	2	1	18
WTW364	FINANCIAL_ENGINEERING_364 Prerequisite/s: [WST211] and [WTW126] and [WTW218] and [WTW286]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			4/4	2/2	18/18

Electives: IAS 361, IAS 382, WST312, WST322, WTW320, WTW382, WTW383, WTW386. All 72 elective credits must be on 3rd year level.
Compulsory credits = (90) Elective credits = (72)
A minimum of (466) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Animal Science	**VKU**	**03134002**

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3

BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
VDG250	NUTRITION_250 Prerequisite/s: [CMY127]	S1	3	0.5	12
VKU210	ANIMAL_SCIENCE_210 Prerequisite/s: [GTS161]	S1	1	0.5	6
Totals for compulsory modules in the first/second terms			16/16	4.5/4.5	42/42

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
VKU220	ANIMAL_SCIENCE_220 Prerequisite/s: [VKU210 GS] or [TDH]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			14/14	4/4	39/39

Compulsory credits = (162) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM355	IMMUNOBIOLOGY_355 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]	S1	1	0.5	9
DAN310	ANIMAL_ANATOMY_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
DFS311	ANIMAL_PHYSIOLOGY_311 Prerequisite/s: [DAF200]	S1	2	0	10
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
RPL310	REPRODUCTION_SCIENCE_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16
WDE310	PRINCIPLES_OF_VELD_MANAGE_310	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			16/16	3.5/3.5	43.5/43.5

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM363	XENO_BIOCHEMISTRY_363	K4	1	0	5
DFS320	GROWTH_PHYSIOLOGY_320 Prerequisite/s: [TDH]	S2	2	0.5	10
RPL320	REPRODUCTION_SCIENCE_320 Prerequisite/s: [RPL310]	S2	2	0.5	10
TLR320	ANIMAL_BREEDING_320 Prerequisite/s: [GTS261]	S2	2	0.5	10
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16
VKU361	ANIMAL_ECOLOGY_361 Prerequisite/s: [TDH]	S2	2	0	8
VKU362	ANIMAL_SCI._BIOTECHNOLOGY_362 Prerequisite/s: [GTS261]	S2	1	0	8
WDE320	PLANTED_PAST_&_FODDERCROPS_320 Prerequisite/s: [WDE310]	S2	2	0.5	14
Totals for compulsory modules in the third/fourth terms			14/15	2.5/2.5	38/43

Compulsory credits = (168) Elective credits = (0)
A minimum of (478) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Applied Mathematics	WTW	02133252

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
WST111	MATHEMATICAL_STATISTICS_111 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW115	DISCRETE_STRUCTURES_115 Prerequisite/s: [Par 1.2]	S1	2	1	8
WTW152	MATHEMATICAL_MODELLING_152 Prerequisite/s: [Par 1.2]	S1	2	1	8
Totals for compulsory modules in the first/second terms			16/16	4/4	29/29

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
WST121	MATHEMATICAL_STATISTICS_121 Prerequisite/s: [WST111 GS]	S2	4	1	16
WTW123	NUMERICAL_ANALYSIS_123 Prerequisite/s: [WTW114 GS]	S2	2	1	8
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
WTW162	DYNAMICAL_PROCESSES_162 Prerequisite/s: [WTW114 GS] and [WTW152 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			16/16	5/5	29/29

Compulsory credits = (116) Elective credits = (36)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
WTW211	LINEAR_ALGEBRA_211 Prerequisite/s: [WTW126]	S1	2	1	12
WTW218	CALCULUS_218 Prerequisite/s: [WTW114] and [WTW128]	S1	2	1	12
Totals for compulsory modules in the first/second terms			4/4	2/2	12/12

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
WTW220	ANALYSIS_220 Prerequisite/s: [WTW114] and [WTW128]	S2	2	1	12
WTW221	LINEAR_ALGEBRA_221 Prerequisite/s: [WTW211]	S2	2	1	12
WTW285	DISCRETE_STRUCTURES_285 Prerequisite/s: [WTW115]	S2	2	1	12
WTW286	DIFFERENTIAL_EQUATIONS_286 Prerequisite/s: [WTW114] and [WTW126] and [WTW128]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			8/8	4/4	24/24

Compulsory credits = (72) Elective credits = (72)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
WTW310	ANALYSIS_310 Prerequisite/s: [WTW220]	S1	2	1	18
WTW382	DYNAMICAL_SYSTEMS_382 Prerequisite/s: [WTW220] and [WTW286]	S1	2	1	18
WTW386	PARTIAL_DIFF_EQUATIONS_386 Prerequisite/s: [WTW218] and [WTW286]	S1	2	1	18
Totals for compulsory modules in the first/second terms			6/6	3/3	27/27

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
WTW383	NUMERICAL_ANALYSIS_383 Prerequisite/s: [WTW114] and [WTW128] and [WTW211]	S2	2	1	18
WTW387	CONTINUUM_MECHANICS_387 Prerequisite/s: [WTW218] and [WTW286]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			4/4	2/2	18/18

A minimum of 54 elective credits at 100 to 300 level can be chosen from any WTW and WST modules. The remainder of the electives at 100 to 300 level can be chosen from any other modules in the syllabi of this faculty.

Compulsory credits = (90) Elective credits = (54)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Biochemistry	BCM	03133001

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9

BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM271	BIOCHEMISTRY_PRACTICAL_271 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254] and [CMY283] and [CMY284]	J1	0	1	6
CMY282	PHYSICAL_CHEMISTRY_282 Prerequisite/s: [CMY117] and [CMY127]	S1	2	0.5	12
CMY284	ORGANIC_CHEMISTRY_284 Prerequisite/s: [CMY117] and [CMY127]	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			8/8	3/3	27/27

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM271	BIOCHEMISTRY_PRACTICAL_271 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254] and [CMY283] and [CMY284]	J1	0	1	6
CMY283	ANALYTICAL_CHEMISTRY_283 Prerequisite/s: [CMY117] and [CMY127]	S2	2	0.5	12
CMY285	INORGANIC_CHEMISTRY_285 Prerequisite/s: [CMY117] and [CMY127]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			8/8	3/3	27/27
Electives can be chosen from Genetics, Microbiology, Human Physiology, Plant Science or Zoology.					
Compulsory credits = (108) Elective credits = (48)					

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM351	BIOCHEMISTRY_OF_PROTEINS_351 Prerequisite/s: [BCM253 + BCM254]	K1	2	1	9
BCM352	PROTEOME_ANALYSIS_352 Prerequisite/s: [BCM253 + BCM254] and [BCM351 GS]	K2	2	1	9
BCM354	BIOCHEM._OF_NUCLEIC_ACIDS_354 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]	S1	1	0.5	9
BCM355	IMMUNOBIOLOGY_355 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM 64] and [BCM265 + BCM266] and [BCM253 + BCM254]	S1	1	0.5	9
Totals for compulsory modules in the first/second terms			4/4	2/2	18/18

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM362	NUTRITIONAL_BIOCHEMISTRY_362	K3	1	0	4
BCM363	XENO_BIOCHEMISTRY_363	K4	1	0	5
BCM364	BUILDING_THE_CELL_364	S2	1	0.5	9
BCM365	IMMUNOBIOCHEMISTRY_365 Prerequisite/s: [BCM355 GS]	S2	1	0.5	9
BCM366	ENZYMOLOGY_366	S2	1	1	9
Totals for compulsory modules in the third/fourth terms			4/4	2/2	17.5/18.5

Electives can be chosen from Chemistry, Genetics, Microbiology, Human Physiology, Plant Science or Zoology.

Compulsory credits = (72) Elective credits = (72)

A minimum of (448) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Biological Sciences	ADM	03130001

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16

PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Generic first-year modules in Biological Sciences: Students who are going to apply for the 20-30 MBChD, or the 2-3 BChD places, that become available in the second term, may enroll for FIL155, MGW112 and MTL181 instead of WTW134 under the condition that, should they not be selected and want to continue with BSc, WTW134 be taken in the second semester.

Compulsory credits = (148) Elective credits = (4)

Field of study	Dept	Code
BSc Biotechnology	GTS	03133052

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16

WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (4)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12

MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
Totals for compulsory modules in the first/second terms			10/10	3.5/3.5	30/30

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			10/10	3.5/3.5	30/30

Electives may be chosen from [ZEN 251 and ZEN 261] or [VKU 210, VKU 220 and VKU 222] or [GKD 250 and GKD 260] or DAF 200 or BME 210 or another module/s subject to TDH.
Compulsory credits = (120) Elective credits = (24)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM351	BIOCHEMISTRY_OF_PROTEINS_351 Prerequisite/s: [BCM253 + BCM254]	K1	2	1	9
BCM354	BIOCHEM._OF_NUCLEIC_ACIDS_354 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]	S1	1	0.5	9

GTS352	GENOMES_352 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
Totals for compulsory modules in the first/second terms			5/3	2.5/1.5	22.5/13.5

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
MBY364	GENE.MANIPULATION/MICROBES.364 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			2/2	1/1	9/9

Information regarding elective modules may be obtained from:
www.up.ac.za/academic/genetics/academic/biotech_electives.htm

Compulsory credits = (54) Elective credits = (90)

A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Chemistry	CMY	02133172

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
PHY171	FIRST_COURSE_IN_PHYSICS_171 Prerequisite/s: [Par 1.2]	J1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			16/16	3/3	29/29

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
PHY171	FIRST_COURSE_IN_PHYSICS_171 Prerequisite/s: [Par 1.2]	J1	4	1	16
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8

WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			16/16	4/4	29/29

Compulsory credits = (116) Elective credits = (36)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CMY282	PHYSICAL_CHEMISTRY_282 Prerequisite/s: [CMY117] and [CMY127]	S1	2	0.5	12
CMY284	ORGANIC_CHEMISTRY_284 Prerequisite/s: [CMY117] and [CMY127]	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			4/4	1/1	12/12

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CMY283	ANALYTICAL_CHEMISTRY_283 Prerequisite/s: [CMY117] and [CMY127]	S2	2	0.5	12
CMY285	INORGANIC_CHEMISTRY_285 Prerequisite/s: [CMY117] and [CMY127]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			4/4	1/1	12/12

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Biochemistry, Zoology and Entomology, Physics, Plant Science, Computer Science, Mathematics and Applied Mathematics.

Compulsory credits = (48) Elective credits = (96)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CMY383	ANALYTICAL_CHEMISTRY_383 Prerequisite/s: [CMY282] and [CMY283] and [CMY284] and [CMY285]	K1	4	1	18
CMY385	INORGANIC_CHEMISTRY_385 Prerequisite/s: [CMY282] and [CMY283] and [CMY284] and [CMY285]	K2	4	1	18
Totals for compulsory modules in the first/second terms			4/4	1/1	18/18

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CMY382	PHYSICAL_CHEMISTRY_382 Prerequisite/s: [CMY282] and [CMY283] and [CMY284] and [CMY285]	K4	4	1	18
CMY384	ORGANIC_CHEMISTRY_384 Prerequisite/s: [CMY282] and [CMY283] and [CMY284] and [CMY285]	K3	4	1	18
Totals for compulsory modules in the third/fourth terms			4/4	1/1	18/18

Compulsory credits = (72) Elective credits = (72)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Earth Sciences	GGY	02133012

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
GLY151	INTRODUCTORY_GEOLOGY_151 Prerequisite/s: [Par 1.2]	K1	4	1	8
GLY152	PHYSICAL_GEOLOGY_152 Prerequisite/s: [Par 1.2]	K2	4	1	8
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			16/16	3/3	29/29

WTW 134 can be taken instead of WTW 114.

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GGY162	REMOTE_SENSING_162	S2	0	1	4
GGY166	SA_&_GLOBAL_GEOMORPHOLOGY_166	K3	4	0	6
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
WKD164	CLIMATE_AND_WEATHER_OF_SA_164	K4	4	0	8
Totals for compulsory modules in the third/fourth terms			16/16	3/3	29/31

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Physics, Zoology and Entomology, Chemistry, Plant Science, Mathematics and Applied Mathematics, Computer Science.

Compulsory credits = (118) Elective credits = (32)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GGY252	PROCESS_GEOMORPHOLOGY_252	K2	4	2	12
GGY283	INTRODUCTORY_GIS_283	S1	2	1	12
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
Totals for compulsory modules in the first/second terms			5/9	2/4	12/24

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GIS220	GEOGRAPHIC_DATA_ANALYSIS_220	S2	3	1	12
Totals for compulsory modules in the third/fourth terms			3/3	1/1	6/6

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Chemistry, Physics, Zoology and Entomology, Plant Science, Mathematics and Applied Mathematics, Computer Science.
Compulsory credits = (48) Elective credits = (96)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GKD350	SOIL_CLASSIF.&_SURVEYING_350 Prerequisite/s: [GKD250 GS]	S1	2	1	14
Totals for compulsory modules in the first/second terms			2/2	1/1	7/7

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GGY361	ENVIRONM.GEOMORPHOLOGY_361	K3	4	2	18
GGY364	ENVIRONMENTAL_MODELLING_364	K4	4	2	18
GIS320	SPATIAL_ANALYSIS_320 Prerequisite/s: [GIS310] or [TDH]	S2	3	1	24
Totals for compulsory modules in the third/fourth terms			7/7	3/3	30/30

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Chemistry, Plant Science, Physics, Zoology and Entomology, Mathematics and Applied Mathematics, Computer Science.
Compulsory credits = (74) Elective credits = (72)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Ecology	ZEN	03133031

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12

GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
ZEN251	INVERTEBRATE_BIOLOGY_251 Prerequisite/s: [ZEN161 GS] or [TDH]	K1	4	1	12
Totals for compulsory modules in the first/second terms			15/11	5/4	40.5/28.5

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
ZEN261	AFRICAN_VERTEBRATES_261 Prerequisite/s: [ZEN161 GS] or [TDH]	K3	4	1	12
Totals for compulsory modules in the third/fourth terms			14/10	4.5/3.5	38/26

Compulsory credits = (136) Elective credits = (10)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT356	PLANT_ECOPHYSIOLOGY_356 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
BOT358	PLANT_ECOLOGY_358 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
ZEN351	POPULATION_ECOLOGY_351	K1	4	2	18
ZEN353	COMMUNITY_ECOLOGY_353	K2	4	2	18
Totals for compulsory modules in the first/second terms			8/8	4/4	36/36

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT366	PLANT_DIVERSITY_366 Prerequisite/s: [BOT161] or [TDH]	S2	2	0	10

BOT367	PRACT_PLANT_IDENTIFICATION_367 Prerequisite/s: [BOT161] or [TDH]	S2	0	1	10
ZEN361	ECOPHYSIOLOGY_361	K3	4	2	18
ZEN362	EVOLUTION_AND_PHYLOGENY_362	K3	4	2	18
ZEN364	CONSERVATION_ECOLOGY_364	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			10/6	5/3	46/28

Compulsory credits = (146) Elective credits = (0)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Entomology	ZEN	03133041

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37
Compulsory credits = (148) Elective credits = (0)					

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
ZEN251	INVERTEBRATE_BIOLOGY_251 Prerequisite/s: [ZEN161 GS] or [TDH]	K1	4	1	12
Totals for compulsory modules in the first/second terms			14/10	4.5/3.5	42/30

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
ZEN261	AFRICAN_VERTEBRATES_261 Prerequisite/s: [ZEN161 GS] or [TDH]	K3	4	1	12
Totals for compulsory modules in the third/fourth terms			14/10	4.5/3.5	38/26

Compulsory credits = (136) Elective credits = (12)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
ZEN351	POPULATION_ECOLOGY_351	K1	4	2	18
ZEN353	COMMUNITY_ECOLOGY_353	K2	4	2	18
ZEN354	PHYSIOLOGY_354	K2	4	2	18
ZEN355	INSECT_DIVERSITY_355 Prerequisite/s: [ZEN251 GS] or [TDH]	K1	4	2	18
Totals for compulsory modules in the first/second terms			8/8	4/4	36/36

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
ZEN361	ECOPHYSIOLOGY_361	K3	4	2	18
ZEN362	EVOLUTION_AND_PHYLOGENY_362	K3	4	2	18
ZEN364	CONSERVATION_ECOLOGY_364	K4	4	2	18
ZEN365	INSECT_PEST_MANAGEMENT_365	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			8/8	4/4	36/36

Compulsory credits = (144) Elective credits = (0)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Environmental and Engineering Geology	GLY	02133042

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
GLY151	INTRODUCTORY_GEOLOGY_151 Prerequisite/s: [Par 1.2]	K1	4	1	8
GLY152	PHYSICAL_GEOLOGY_152 Prerequisite/s: [Par 1.2]	K2	4	1	8
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW158	CALCULUS_158 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
SWK122	MECHANICS_122 Prerequisite/s: [WTW158 or WTW114]	S2	4	0	16
Totals for compulsory modules in the third/fourth terms			16/16	2/2	29/29

Compulsory credits = (132) Elective credits = (20)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
GLY251	CRYSTAL_OPTICS_&_CRYS.CHEM.251 Prerequisite/s: [CMY117 GS] and [GLY151 and 2 of GLY152, GLY161, GLY162.]	K1	4	2	12
GLY252	MINERALOGY_252 Prerequisite/s: [GLY251 GS] of [TDH]	K2	4	2	12
GLY253	SEDIMENTOLOGY_253 Prerequisite/s: [3 of GLY151, GLY152, GLY161, GLY162.]	K2	4	2	12
GLY254	STRUCTURAL_GEOLOGY_254 Prerequisite/s: [3 of GLY151, GLY152, GLY161, GLY162.]	K1	4	2	12
SWK210	STRENGTH_OF_MATERIALS_210 Prerequisite/s: [SWK122] and [WTW128 # or WTW158#]	S1	3	2	16
Totals for compulsory modules in the first/second terms			14/14	7/7	38/38

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GLY261	IGNEOUS_PETROLOGY_261 Prerequisite/s: [GLY252] or [TDH]	K3	4	2	12
GLY262	METAMORPHIC_PETROLOGY_262 Prerequisite/s: [GLY252] or [TDH]	K4	4	2	12
GLY264	INTRODUCTION_TO_GEOPHYSICS_264 Prerequisite/s: [GLY151] and [GLY152] and [WTW114]	K3	4	2	12
GLY265	GROUNDWATER_265 Prerequisite/s: [GLY152] or [TDH]	K3	4	2	12
Totals for compulsory modules in the third/fourth terms			12/4	6/2	36/12

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GLY363	ENGINEERING_GEOLOGY_363 Prerequisite/s: [GLY152] and [GLY265] or [TDH]	K1	4	2	18
GLY362	GEOSTAT.&_ORE_RESERV._CALC.362	K2	4	2	18
SGM311	SOIL_MECHANICS_311	S1	3	1	16
Totals for compulsory modules in the first/second terms			7/7	3/3	26/26

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GLY361	ORE_DEPOSITS_361	K3	4	2	18
GLY352	GEODYNAMICS_ORE_FORMATION_352 Prerequisite/s: [GLY261]	K4	4	2	18
PSZ311	ROCK_MECHANICS_311 Prerequisite/s: [SWK210]	S2	3	1	16
Totals for compulsory modules in the third/fourth terms			7/7	3/3	26/26

Electives for the first to third year can be chosen from the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Chemistry, Mathematics and Applied Mathematics, Physics and Computer Science.

Compulsory credits = (104) Elective credits = (44)

A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Environmental Sciences	GGY	02133361

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
GGY157	INTRO.TO_ENVIRONM.SCIENCES_157	K1	4	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/16	3/3	35/29

WTW 134 can be taken instead of WTW 114.

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GGY162	REMOTE_SENSING_162	S2	0	1	4
GGY166	SA_&_GLOBAL_GEOMORPHOLOGY_166	K3	4	0	6
WKD164	CLIMATE_AND_WEATHER_OF_SA_164	K4	4	0	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/39

Electives can be chosen from the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Physics, Chemistry, Plant Science , Mathematics and Applied Mathematics, Zoology and Entomology, Anthropology and Archaeology and Computer Science.
Compulsory credits = (140) Elective credits = (12)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
GGY252	PROCESS_GEOMORPHOLOGY_252	K2	4	2	12
GGY283	INTRODUCTORY_GIS_283	S1	2	1	12
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
ZEN251	INVERTEBRATE_BIOLOGY_251 Prerequisite/s: [ZEN161 GS] or [TDH]	K1	4	1	12
Totals for compulsory modules in the first/second terms			11/11	4/5	30/30

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
ZEN261	AFRICAN_VERTEBRATES_261 Prerequisite/s: [ZEN161 GS] or [TDH]	K3	4	1	12
Totals for compulsory modules in the third/fourth terms			6/2	2/1	18/6

Electives can be chosen from the following departments: Geography, Geoinformatics and Meteorology, Physics, Geology, Plant Production and Soil Science, Chemistry, Plant Science , Mathematics and Applied Mathematics, Zoology and Entomology, Anthropology and Archaeology and Computer Science.
Compulsory credits = (84) Elective credits = (60)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
GGY355	HUMAN_ENVIRONM._INTERACT._355	K2	4	2	18
Totals for compulsory modules in the first/second terms			0/4	0/2	0/18

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
GGY361	ENVIRONM.GEOMORPHOLOGY_361	K3	4	2	18
GGY364	ENVIRONMENTAL_MODELLING_364	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			4/4	2/2	18/18

Electives can be chosen from modules in the departments: Geography, Geoinformatics and meteorology, Geology, Plant Production and Soil Science, Physics, Chemistry, Plant Science , Mathematics and Applied Mathematics, Zoology and Entomology, Anthropology and Archaeology and Computer Science.
Compulsory credits = (54) Elective credits = (90)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Food Management	VBR	02133384

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FSG110	PHYSIOLOGY_110	S1	3	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
OBS114	BUSINESS_MANAGEMENT_114	S1	3	0	10
VDS111	FOOD_SUPPLY_&QUALITY_CONTR.111	S1	2	1	10
Totals for compulsory modules in the first/second terms			20/20	3/3	34/34

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
FSG120	PHYSIOLOGY_120 Prerequisite/s: [FSG110 GS]	S2	3	0	6
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10
Totals for compulsory modules in the third/fourth terms			20/20	2.5/2.5	33/33

Compulsory credits = (134) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
OBS210	BUSINESS_MANAGEMENT_210	S1	3	0	16
VDS210	FOODS_210 Prerequisite/s: [VDS111]	S1	3	1	18
Totals for compulsory modules in the first/second terms			12/12	3/3	35/35

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3

BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
FST260	PRIN/FOOD_PROC._&_PRESERV._260 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S2	2	1	12
KEP220	CULTURAL_EATING_PATTERNS_220	S2	3	0	12
VDS221	FOODS_221 Prerequisite/s: [VDS210]	S2	3	1	18
Totals for compulsory modules in the third/fourth terms			12/12	3/3	33/33

Compulsory credits = (136) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM110	MARKETING_MANAGEMENT_110	S1	3	0	10
FST351	FOOD_CHEMISTRY-(1)_351 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254]	S1	2	1	18
FST352	FOOD_CHEMISTRY-(2)_352 Prerequisite/s: [BCM255 + BCM256] of [TDH] and [BCM263 + BCM264] of [TDH] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254] of [TDH]	S1	2	1	18
VDG311	NUTRITION_311 Prerequisite/s: [FSG110] and [FSG120] or [VDG220]	S1	3	1	17
VDS310	FOODS_310 Prerequisite/s: [VDS210] and [VDS221]	S1	3	1	21
Totals for compulsory modules in the first/second terms			13/13	4/4	42/42

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM121	CONS.BEHAVIOUR&SERV.MARKET.121	S2	3	0	10
VDB321	FOOD_SERVICE_MANAGEMENT_321 Prerequisite/s: [VDS322 #]	S2	3	0.5	18
VDG321	NUTRIT._DURING_LIFE_CYCLE_321 Prerequisite/s: [VDG311]	S2	3	1	17
VDS322	LARGE_SCALE_PLANNING&_PREP.322 Prerequisite/s: [KEP261 or KEP220] and [VDS221]	S2	3	3	29
Totals for compulsory modules in the third/fourth terms			12/12	4.5/4.5	37/37

Compulsory credits = (158) Elective credits = (0)

Fourth year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
FST413	PRODUCT_DEV.&_QUALITY_MAN._413 Prerequisite/s: [FST260] or [TDH] and [FST351] and [FST352]	S1	3	1	30
PGB410	PROJECT:_RESEARCH_METHODOL.410 Prerequisite/s: [Final-year status]	S1	2	0	10
VDB410	FOOD_SERVICE_MANAGEMENT_410 Prerequisite/s: [ABV320] and [VDB321 GS]	S1	3	1	24
VDS413	FOODS_413 Prerequisite/s: [VDS310 or VDS322]	S1	3	2	30
VDS423	FOODS_423	S1	3	0	15
Totals for compulsory modules in the first/second terms			14/14	4/4	54.5/54.5

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
MBY362	FOOD_MICROBIOLOGY_362 Prerequisite/s: [MBY251]	S2	2	1	18
VDS426	FOOD_RESEARCH_PROJECT_426 Prerequisite/s: [PGB410 #] and [VDS310]	S2	1	2	18
Totals for compulsory modules in the third/fourth terms			3/3	3/3	18/18

OPI480 (Experiential training in the industry): During the 4 years of study, during holidays, weekends and after hours, students must complete a total of 480 hours experiential training in the industry to develop practical and occupational skills. This is equal to 3 weeks x 40 hours (120 hours) per year, according to requirements as determine by the head of department. This training must be successfully completed together with a complete portfolio before the degree will be conferred.

Compulsory credits = (145) Elective credits = (0)

A minimum of (573) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Food Science	VDW	03134011

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16

PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (4)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
FST250	INTRO/FOOD_SCIENCE_&_TECH._250 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S1	2	1	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
VDG250	NUTRITION_250 Prerequisite/s: [CMY127]	S1	3	0.5	12
Totals for compulsory modules in the first/second terms			11/11	3.5/3.5	30/30

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
FST260	PRIN/FOOD_PROC._&_ PRESERV._260 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S2	2	1	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			8/8	3/3	24/24

Compulsory credits = (108) Elective credits = (36)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
FST350	INTEGRATED_FOOD_SCIENCE_350 Prerequisite/s: [FST250] and [FST260] and [Second-year status] or [TDH]	J1	2	0	9
FST351	FOOD_CHEMISTRY-(1)_351 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254]	S1	2	1	18
FST352	FOOD_CHEMISTRY-(2)_352 Prerequisite/s: [BCM255 + BCM256] of [TDH] and [BCM263 + BCM264] of [TDH] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254] of [TDH]	S1	2	1	18
FST353	FOOD_ENGINEERING_353 Prerequisite/s: [FST260] or [TDH]	S1	3	0.5	18
Totals for compulsory modules in the first/second terms			9/9	2.5/2.5	31.5/31.5

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
FST350	INTEGRATED_FOOD_SCIENCE_350 Prerequisite/s: [FST250] and [FST260] and [Second-year status] or [TDH]	J1	2	0	9
FST360	PRINC_SCI_&TECH_PLANT FOOD_360 Prerequisite/s: [FST250] and [FST260] and [FST351] and [FST352] or [TDH]	S2	2	1	18
FST361	ANIMAL_FOOD_SCIENCE_361 Prerequisite/s: [FST250] and [FST260] and [FST351] and [FST352] or [TDH]	S2	2	1	18
MBY362	FOOD_MICROBIOLOGY_362 Prerequisite/s: [MBY251]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			8/8	3/3	31.5/31.5

Compulsory credits = (126) Elective credits = (18)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Genetics	GTS	03133051

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6

GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (4)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
ZEN251	INVERTEBRATE_BIOLOGY_251 Prerequisite/s: [ZEN161 GS] or [TDH]	K1	4	1	12
Totals for compulsory modules in the first/second terms			14/10	4.5/3.5	42/30

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9

BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
ZEN261	AFRICAN_VERTEBRATES_261 Prerequisite/s: [ZEN161 GS] or [TDH]	K3	4	1	12
Totals for compulsory modules in the third/fourth terms			14/10	4.5/3.5	42/30

Compulsory credits = (144) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
GTS351	EUKARYOTIC_GENE_CON.&_DEVL.351 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
GTS352	GENOMES_352 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
GTS353	ADV._POPULATION_GENETICS_353 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
Totals for compulsory modules in the first/second terms			6/6	3/3	27/27

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
GTS361	HUMAN_GENETICS_361 Prerequisite/s: [GTS352 GS] or [TDH]	K3	4	2	18
GTS363	EVOLUTIO._&_PHYLO-GENETICS_363 Prerequisite/s: [GTS353 GS] or [TDH]	S2	2	1	18
GTS366	PLANT_GENETICS_&_BIOTECHN._366 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH] and [GTS351 is recommended] and [GTS352 is recommended]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			8/4	4/2	36/18

Electives can be chosen from the following list of third-year modules: BCM351, BCM352, BCM354, BCM355, BCM364, BCM365, BCM366, BIF310, BIF320, BOT357, BOT365, GTS365, MBY351, MBY353, MBY361, MBY363, MBY364, PLG364, ZEN351, ZEN352, ZEN354, ZEN355, ZEN362, ZEN363, ZEN364.

Compulsory credits = (108) Elective credits = (36)

A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Geography	GGY	02133385

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
GGY132	CARTOGRAPHIC_SKILLS_132	S1	0	1	4
GGY156	INTRO.TO_HUMAN_GEOGRAPHY_156	K2	4	0	6
GGY157	INTRO.TO_ENVIRONM.SCIENCES_157	K1	4	0	6
GMC110	CARTOGRAPHY_110 Prerequisite/s: [GGY132 #]	S1	3	0	8
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			15/15	2/2	25/25

WTW 134 can be taken instead of WTW 114.

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GGY162	REMOTE_SENSING_162	S2	0	1	4
GGY166	SA_&_GLOBAL_GEOMORPHOLOGY_166	K3	4	0	6
WKD164	CLIMATE_AND_WEATHER_OF_SA_164	K4	4	0	8
Totals for compulsory modules in the third/fourth terms			8/8	1/1	13/15

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Plant Production and Soil Science, Chemistry, Plant Science, Physics, Zoology and Entomology, Geology, Mathematics and Applied Mathematics, Computer Science, Anthropology and Archaeology, Economics, History, Psychology, Sociology, Political Sciences.

Compulsory credits = (78) Elective credits = (74)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
GGY252	PROCESS_GEOMORPHOLOGY_252	K2	4	2	12
GGY283	INTRODUCTORY_GIS_283	S1	2	1	12
Totals for compulsory modules in the first/second terms			2/6	1/3	6/18

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GGY263	URBAN_MODELLING_263	K3	4	2	12
GGY264	URBAN_SOCIAL_MORPHOLOGY_264	K4	4	2	12
GIS220	GEOGRAPHIC_DATA_ANALYSIS_220	S2	3	1	12
Totals for compulsory modules in the third/fourth terms			7/7	3/3	18/18

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Plant Production and Soil Science, Chemistry, Plant Science, Physics, Zoology and Entomology, Geology, Mathematics and Applied Mathematics, Computer Science, Anthropology and Archaeology, Economics, History, Psychology, Sociology, Political Sciences.

Compulsory credits = (60) Elective credits = (84)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GGY354	DEVELOPMENT_GEOGRAPHY_354	K1	4	2	18
GGY355	HUMAN_ENVIRONM._INTERACT._355	K2	4	2	18
GIS310	GEOGRAPHIC_INFORMATION_SYS.310 Prerequisite/s: [GGY283] or [TDH]	S1	3	1	24
Totals for compulsory modules in the first/second terms			7/7	3/3	30/30

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GGY361	ENVIRONM.GEOMORPHOLOGY_361	K3	4	2	18
GGY364	ENVIRONMENTAL_MODELLING_364	K4	4	2	18
GIS320	SPATIAL_ANALYSIS_320 Prerequisite/s: [GIS310] or [TDH]	S2	3	1	24
Totals for compulsory modules in the third/fourth terms			7/7	3/3	30/30

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Plant Production and Soil Science, Chemistry, Plant Science, Physics, Zoology and Entomology, Geology, Mathematics and Applied Mathematics, Computer Science, Anthropology and Archaeology, Economics, History, Psychology, Sociology, Political Sciences.

Compulsory credits = (120) Elective credits = (24)

A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Geoinformatics	GGY	02133383

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
GGY132	CARTOGRAPHIC_SKILLS_132	S1	0	1	4
GGY156	INTRO.TO_HUMAN_GEOGRAPHY_156	K2	4	0	6
GGY157	INTRO.TO_ENVIRONM.SCIENCES_157	K1	4	0	6
GMC110	CARTOGRAPHY_110 Prerequisite/s: [GGY132 #]	S1	3	0	8
INF112	INFORMATICS_112 Prerequisite/s: [Par 1.2]	S1	3	0	10
INF153	INFORMATICS_153 Prerequisite/s: [Par 1.2]	S1	2	0	5
INF154	INFORMATICS_154 Prerequisite/s: [Par 1.2]	S1	1	2	5
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			21/21	4/4	35/35

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GGY162	REMOTE_SENSING_162	S2	0	1	4
GGY166	SA_&_GLOBAL_GEOMORPHOLOGY_166	K3	4	0	6
INF163	INFORMATICS_163 Prerequisite/s: [INF153]	S2	2	0	5
INF164	INFORMATICS_164 Prerequisite/s: [INF154]	S2	1	2	5
WKD164	CLIMATE_AND_WEATHER_OF_SA_164	K4	4	0	8
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			15/15	5/5	26/28

Compulsory credits = (124) Elective credits = (28)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GGY283	INTRODUCTORY_GIS_283	S1	2	1	12
GMC210	CARTOGRAPHY_210 Prerequisite/s: [GMC110]	S1	3	1	12
INF214	INFORMATICS_214 Prerequisite/s: [CIL111] and [CIL121]	S1	3	2	14

STK110	STATISTICS_110 Prerequisite/s: [Par 1.2]	S1	3	1	13
Totals for compulsory modules in the first/second terms			11/11	5/5	25.5/25.5

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GIS220	GEOGRAPHIC_DATA_ANALYSIS_220	S2	3	1	12
GMA220	REMOTE_SENSING_220	S2	3	1	16
INF261	INFORMATICS_261 Prerequisite/s: [INF214]	S2	1	1	7
STK120	STATISTICS_120 Prerequisite/s: [STK110 GS]	S2	3	1	13
SUR220	SURVEYING_220 Prerequisite/s: [WTW114 GS]	S2	3	1	16
Totals for compulsory modules in the third/fourth terms			13/13	5/5	32/32

Compulsory credits = (115) Elective credits = (29)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GIS310	GEOGRAPHIC_INFORMATION_SYS.310 Prerequisite/s: [GGY283] or [TDH]	S1	3	1	24
GMC310	CARTOGRAPHY_310 Prerequisite/s: [GMC210]	S1	3	1	24
Totals for compulsory modules in the first/second terms			6/6	2/2	24/24

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GIS320	SPATIAL_ANALYSIS_320 Prerequisite/s: [GIS310] or [TDH]	S2	3	1	24
GMA320	REMOTE_SENSING_320	S2	3	1	24
GMT320	PROJECT:_GEOMATICS_320 Prerequisite/s: [GIS310] or [TDH]	S2	3	1	24
Totals for compulsory modules in the third/fourth terms			9/9	3/3	36/36

Compulsory credits = (120) Elective credits = (24)
A minimum of (440) credits is required to obtain the degree.

Field of study	**Dept**	**Code**
BSc Geology	GLY	02133022

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4

CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
GLY151	INTRODUCTORY_GEOLOGY_151 Prerequisite/s: [Par 1.2]	K1	4	1	8
GLY152	PHYSICAL_GEOLOGY_152 Prerequisite/s: [Par 1.2]	K2	4	1	8
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
Totals for compulsory modules in the third/fourth terms			12/12	2/2	21/21

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Chemistry, Mathematics and Applied Mathematics, Physics and Computer Science.

Compulsory credits = (116) Elective credits = (36)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
GLY251	CRYSTAL_OPTICS_&_CRYS.CHEM.251 Prerequisite/s: [CMY117 GS] and [GLY151 and 2 of GLY152, GLY161, GLY162.]	K1	4	2	12
GLY252	MINERALOGY_252 Prerequisite/s: [GLY251 GS] of [TDH]	K2	4	2	12
GLY253	SEDIMENTOLOGY_253 Prerequisite/s: [3 of GLY151, GLY152, GLY161, GLY162.]	K2	4	2	12
GLY254	STRUCTURAL_GEOLOGY_254 Prerequisite/s: [3 of GLY151, GLY152, GLY161, GLY162.]	K1	4	2	12
Totals for compulsory modules in the first/second terms			11/11	5/5	30/30

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GLY261	IGNEOUS_PETROLOGY_261 Prerequisite/s: [GLY252] or [TDH]	K3	4	2	12
GLY262	METAMORPHIC_PETROLOGY_262 Prerequisite/s: [GLY252] or [TDH]	K4	4	2	12
GLY264	INTRODUCTION_TO_GEOPHYSICS_264 Prerequisite/s: [GLY151] and [GLY152] and [WTW114]	K3	4	2	12
GLY265	GROUNDWATER_265 Prerequisite/s: [GLY152] or [TDH]	K3	4	2	12
Totals for compulsory modules in the third/fourth terms			12/4	6/2	36/12

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Chemistry, Mathematics and Applied Mathematics, Physics and Computer Science.
Compulsory credits = (108) Elective credits = (36)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GLY363	ENGINEERING_GEOLOGY_363 Prerequisite/s: [GLY152] and [GLY265] or [TDH]	K1	4	2	18
GLY362	GEOSTAT.&_ORE_RESERV._CALC.362	K2	4	2	18
Totals for compulsory modules in the first/second terms			4/4	2/2	18/18

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GLY361	ORE_DEPOSITS_361	K3	4	2	18
GLY352	GEODYNAMICS_ORE_FORMATION_352 Prerequisite/s: [GLY261]	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			4/4	2/2	18/18

Electives can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Chemistry, Mathematics and Applied Mathematics, Physics and Computer Science.
Compulsory credits = (72) Elective credits = (72)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Human Genetics	GTS	03134031

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9

BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
FLG211	INTRODUCTORY_&_NEUROPHYS.211 Prerequisite/s: [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]	S1	2	1	16
FLG212	CIRCULATORY_PHYSIOLOGY_212 Prerequisite/s: [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]	S1	2	1	16
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
Totals for compulsory modules in the first/second terms			12/12	4.5/4.5	40/40

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
FLG221	LUNG/RENAL_PHYS,ACID/TEMP._221 Prerequisite/s: [FLG211] and [FLG212]	S2	2	1	16
FLG222	DIGEST.,ENDOCR.&_REPROD/SYS.222 Prerequisite/s: [FLG211] and [FLG212]	S2	2	1	16
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			10/10	3.5/3.5	34/34

Compulsory credits = (148) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM351	BIOCHEMISTRY_OF_PROTEINS_351 Prerequisite/s: [BCM253 + BCM254]	K1	2	1	9

BCM354	BIOCHEM._OF_NUCLEIC_ACIDS_354 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]	S1	1	0.5	9
BCM355	IMMUNOBIOLOGY_355 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]	S1	1	0.5	9
GTS351	EUKARYOTIC_GENE_CON.&_DEVL.351 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
GTS352	GENOMES_352 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
GTS353	ADV._POPULATION_GENETICS_353 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
Totals for compulsory modules in the first/second terms			10/8	5/4	45/36

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
GTS361	HUMAN_GENETICS_361 Prerequisite/s: [GTS352 GS] or [TDH]	K3	4	2	18
GTS363	EVOLUTIO._&_PHYLO-GENETICS_363 Prerequisite/s: [GTS353 GS] or [TDH]	S2	2	1	18
GTS365	APPLIED_MEDICAL_GENETICS_365 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			6/6	3/3	27/27

Electives to be chosen from the following list of third-year modules: BCM352, BCM365, BCM366, BCM364, BIF310, BIF320, FAR381, FAR382, GTS366, MBY351, MBY353, MBY364, MBY363.

Compulsory credits = (135) Elective credits = (18)

A minimum of (449) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Human Physiology	FLG	03134021

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16

PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

Students who are going to apply for the 20-30 MBChB places, or the 2-3 BChD places, that become available in the second term, may enroll for FIL155(6), MGW112(6) and MTL181(6) instead of WTW134 under the condition that, should they not be selected and want to continue with BSc, WTW134 must be taken in the second semester.
Students should take note of the prerequisites for FLG 211 and FLG 212. Students who, after the first year do not comply with the prerequisites for these modules, will be required to apply to Student Administration, Faculty of Natural and Agricultural Sciences, to remain in the study programme.

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			14/14	2.5/2.5	25/25

Electives can be chosen from ANA121(4), ANA126(4), MBY161(8) , BOT 161 (8), ZEN 161 (8) or WTW152(8). Students who did not take WTW134 in the first semester are reminded to enroll for it in the second semester.
Students should take note of the prerequisites for FLG 211 and FLG 212. Students who after the first year do not comply with the prerequisites for these modules will be required to apply to Student Administration, Faculty of Natural and Agricultural Sciences, to remain in the study programme.

Compulsory credits = (124) Elective credits = (28)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3

BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
FLG211	INTRODUCTORY_&_NEUROPHYS.211 Prerequisite/s: [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]	S1	2	1	16
FLG212	CIRCULATORY_PHYSIOLOGY_212 Prerequisite/s: [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]	S1	2	1	16
Totals for compulsory modules in the first/second terms			8/8	3/3	28/28

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
FLG221	LUNG/RENAL_PHYS,ACID/TEMP._221 Prerequisite/s: [FLG211] and [FLG212]	S2	2	1	16
FLG222	DIGEST.,ENDOCR.&_REPROD/SYS.222 Prerequisite/s: [FLG211] and [FLG212]	S2	2	1	16
Totals for compulsory modules in the third/fourth terms			8/8	3/3	28/28

Electives can be chosen from Chemistry 283 and 284, Genetics, Microbiology, Plant Science or Zoology.

Compulsory credits = (112) Elective credits = (24)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
ANA316	HISTOLOGY_TECHNIQUES_316 Prerequisite/s: [ANA226]	S1	2	2	16

FLG311	APPL.CELLULAR_PHYSIOLOGY_311 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S1	1	1	14
FLG312	DEVELOPMENTAL_PHYSIOLOGY_312 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S1	1	0	9
FLG313	RESEARCH_METH.&_LIT.STUDY_313 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S1	1	1	14
FLG314	IMMUNOLOGY_314 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S1	1	0	9
Totals for compulsory modules in the first/second terms			6/6	4/4	31/31

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
FLG322	INDUSTRIAL_PHYSIOLOGY_322 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	1	1	14
FLG324	EXERCISE_PHYSIOLOGY_324 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	1	1	14
FLG325	NUTRITION_PHYSIOLOGY_325 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	1	0	9
FLG328	PATHOPHYSIOLOGY_328 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	1	0	9
FLG329	INTEGRATED_HUMAN_PHYSIOL._329 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	0	1	9
Totals for compulsory modules in the third/fourth terms			4/4	3/3	27.5/27.5

Electives can be chosen from Chemistry 383 and 384, Genetics, Biochemistry, Microbiology, Plant Science, Zoology or Pharmacology.
Compulsory credits = (117) Elective credits = (35)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Human Physiology, Genetics and Psychology	FLG	02133392

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
SLK110	PSYCHOLOGY_110	S1	2	0	12
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			22/22	4/4	43/43

Students who are going to apply for the 20-30 MBChB places, or the 2-3 BChD places, that become available in the second term, may enrol for FIL155(6), MGW112(6) and MTL181(6) instead of WTW134 under the condition that, should they not be selected and want to continue with BSc, WTW134 must be taken in the second semester.
Students should take note of the prerequisites for FLG 211 and FLG 212. Students who, after the first year do not comply with the prerequisites for this module, will be required to apply to Student Administration, Faculty of Natural and Agricultural Sciences, to remain in the study programme.

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8

SLK120	PSYCHOLOGY_120	S2	2	0	12
Totals for compulsory modules in the third/fourth terms			16/16	2.5/2.5	31/31

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
FLG211	INTRODUCTORY_&_NEUROPHYS.211 Prerequisite/s: [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]	S1	2	1	16
FLG212	CIRCULATORY_PHYSIOLOGY_212 Prerequisite/s: [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]	S1	2	1	16
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
SLK210	PSYCHOLOGY_210	S1	2	0	20
Totals for compulsory modules in the first/second terms			12/12	3.5/3.5	44/44

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3

FLG221	LUNG/RENAL_PHYS,ACID/TEMP._221 Prerequisite/s: [FLG211] and [FLG212]	S2	2	1	16
FLG222	DIGEST.,ENDOCR.&_REPROD/SYS.222 Prerequisite/s: [FLG211] and [FLG212]	S2	2	1	16
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
SLK220	PSYCHOLOGY_220	S2	2	0	20
Totals for compulsory modules in the third/fourth terms			12/12	3.5/3.5	44/44

Students who wish to apply for BSc(Hons): Genetics, will be required to register for additional undergraduate Genetics modules.
Students who are going to apply for the BSocSci (Hons) Psychology programme must complete the following research modules: RES 151 (first year), RES 261 (second year) and RES 361 (third year).

Compulsory credits = (176) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
FLG314	IMMUNOLOGY_314 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S1	1	0	9
GTS351	EUKARYOTIC_GENE_CON.&_DEVL.351 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
GTS352	GENOMES_352 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
SLK310	PSYCHOLOGY_310	S1	2	0	30
Totals for compulsory modules in the first/second terms			7/7	2/2	37.5/37.5

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
FLG325	NUTRITION_PHYSIOLOGY_325 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	1	0	9
FLG327	HIGHER_NEUROLOGICAL_FUNCT.327 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	0	2	20
FLG328	PATHOPHYSIOLOGY_328 Prerequisite/s: [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]	S2	1	0	9

GTS361	HUMAN_GENETICS_361 Prerequisite/s: [GTS352 GS] or [TDH]	K3	4	2	18
SLK320	PSYCHOLOGY_320	S2	2	0	30
Totals for compulsory modules in the third/fourth terms			8/4	4/2	52/34

Students who are going to apply for the BSocSci (Hons) Psychology programme must complete the following research modules: RES 151 (first year), RES 261 (second year) and RES 361 (third year).

Compulsory credits = (161) Elective credits = (0)

A minimum of (485) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Mathematical Statistics	WST	02133273

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
WST111	MATHEMATICAL_STATISTICS_111 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			12/12	2/2	21/21

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
WST121	MATHEMATICAL_STATISTICS_121 Prerequisite/s: [WST111 GS]	S2	4	1	16
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			12/12	3/3	21/21

Students in Mathematical Statistics who also want to be trained for the Insurance Industry, Econometrics or Banking, normally choose:
EKN113, 123 (30) or EKN110, 120 (20)
FBS110, 120 (20) or FRK111, 121 (22)
COS130 (16) or COS110 (16)
Other students choose modules from any other subject/faculty according to their own specific career requirements.

Compulsory credits = (84) Elective credits = (68)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
WST211	MATHEMATICAL_STATISTICS_211 Prerequisite/s: [WST111] and [WST121] and [WTW114 GS] and [WTW126 GS] and [WTW128 GS]	S1	4	2	24
WTW211	LINEAR_ALGEBRA_211 Prerequisite/s: [WTW126]	S1	2	1	12
WTW218	CALCULUS_218 Prerequisite/s: [WTW114] and [WTW128]	S1	2	1	12
Totals for compulsory modules in the first/second terms			8/8	4/4	24/24

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
WST221	MATHEMATICAL_STATISTICS_221 Prerequisite/s: [WST211 GS]	S2	4	2	24
WTW220	ANALYSIS_220 Prerequisite/s: [WTW114] and [WTW128]	S2	2	1	12
WTW221	LINEAR_ALGEBRA_221 Prerequisite/s: [WTW211]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			8/8	4/4	24/24

Insurance Industry students normally choose: IAS211 and 282. Econometrics students normally choose: EKN214, 224 and STK281(42). Other students choose modules from any other subject/faculty according to their own specific career requirements.
Compulsory credits = (96) Elective credits = (48)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
WST311	MULTIVARIATE_ANALYSIS_311 Prerequisite/s: [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]	S1	2	1	18
WST312	STOCHASTIC_PROCESSES_312 Prerequisite/s: [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]	S1	2	1	18
Totals for compulsory modules in the first/second terms			4/4	2/2	18/18

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
WST321	TIME_SERIES_ANALYSIS_321 Prerequisite/s: [WST211] and [WST221] and [WST311 GS] and [WTW211 GS] and [WTW218 GS]	S2	2	1	18

WST322	ACTUARIAL_STATISTICS_322 Prerequisite/s: [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			4/4	2/2	18/18

Insurance Industry students normally choose IAS 382. Econometrics students normally choose: EKN310, 320 and 314(60). Other students choose modules from any other faculty according to their own specific career requirements.
Important: Elective modules to be selected in order to comply with the required minimum credits per level, provided there are no clashes on the class, test and examination time tables.

Compulsory credits = (72) Elective credits = (72)

A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Mathematics	WTW	02133262

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
WST111	MATHEMATICAL_STATISTICS_111 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW115	DISCRETE_STRUCTURES_115 Prerequisite/s: [Par 1.2]	S1	2	1	8
WTW152	MATHEMATICAL_MODELLING_152 Prerequisite/s: [Par 1.2]	S1	2	1	8
Totals for compulsory modules in the first/second terms			16/16	4/4	29/29

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
WST121	MATHEMATICAL_STATISTICS_121 Prerequisite/s: [WST111 GS]	S2	4	1	16
WTW123	NUMERICAL_ANALYSIS_123 Prerequisite/s: [WTW114 GS]	S2	2	1	8
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8

WTW162	DYNAMICAL_PROCESSES_162 Prerequisite/s: [WTW114 GS] and [WTW152 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			16/16	5/5	29/29

Compulsory credits = (116) Elective credits = (36)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
WTW211	LINEAR_ALGEBRA_211 Prerequisite/s: [WTW126]	S1	2	1	12
WTW218	CALCULUS_218 Prerequisite/s: [WTW114] and [WTW128]	S1	2	1	12
Totals for compulsory modules in the first/second terms			4/4	2/2	12/12

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
WTW220	ANALYSIS_220 Prerequisite/s: [WTW114] and [WTW128]	S2	2	1	12
WTW221	LINEAR_ALGEBRA_221 Prerequisite/s: [WTW211]	S2	2	1	12
WTW285	DISCRETE_STRUCTURES_285 Prerequisite/s: [WTW115]	S2	2	1	12
WTW286	DIFFERENTIAL_EQUATIONS_286 Prerequisite/s: [WTW114] and [WTW126] and [WTW128]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			8/8	4/4	24/24

Compulsory credits = (72) Elective credits = (72)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
WTW310	ANALYSIS_310 Prerequisite/s: [WTW220]	S1	2	1	18
WTW381	ALGEBRA_381 Prerequisite/s: [WTW114] and [WTW211]	S1	2	1	18
Totals for compulsory modules in the first/second terms			4/4	2/2	18/18

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
WTW320	ANALYSIS_320 Prerequisite/s: [WTW218] and [WTW310]	S2	2	1	18
WTW389	GEOMETRY_389 Prerequisite/s: [WTW211]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			4/4	2/2	18/18

A minimum of 54 elective credits at 100 to 300 level can be chosen from any WTW and WST modules. The remainder of the electives at 100 to 300 level can be chosen from any other modules in the syllabi of this faculty.

Compulsory credits = (72) Elective credits = (72)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Medical Sciences	ANA	03134020

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FIL155	SCIENCE_AND_WORLD_VIEWS_155	K1	1	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			21/20	4/4	43/37

NOTE: Students who intend to apply for admission to one of the 20 to 30 MBChB places of the two to three BChD places becoming available in the second semester, may register in the first semester for FIL155, MGW112 and MTL181 in the place of WTW134: With the proviso that these students, should they not be selected and wish to continue with the BSc: Medical Science degree programme, take WTW134 in the second semester of the latter degree programme.

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
ANA121	INTR.:_HUMAN_ANAT.&_EMBRIOL121 Prerequisite/s: [MLB111 GS]	S2	1	1	4
ANA122	HUMAN_OSTEOLOGY_122	S2	1	1	4
ANA126	BASIC_HUMAN_HISTOLOGY_126 Prerequisite/s: [CMY117 GS] and [MLB111 GS]	S2	1	1	4
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8

MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			19/19	6/6	35/35

Compulsory credits = (150) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
ANA214	HUMAN_CELL_&_DEVELOPM.BIOL.214 Prerequisite/s: [ANA121] and [ANA126]	S1	2	1	12
ANA215	PALEO-ANTHROPOLOGY_215	S1	2	1	10
ANA217	HUMAN_ANATOMY_217 Prerequisite/s: [ANA121] and [ANA122]	S1	2	1	16
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
Totals for compulsory modules in the first/second terms			10/10	4/4	31/31

Candidates have to choose in the first semester either FLG211 (16) and FLG 212 (16) OR GTS 251 (12) as options and have to complete the option until the final year.

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
ANA226	HUMAN_HISTOLOGY_226 Prerequisite/s: [ANA126]	S2	1	1	10
ANA227	HUMAN_ANATOMY_227 Prerequisite/s: [ANA217 GS]	S2	2	2	16
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9

BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
Totals for compulsory modules in the third/fourth terms			7/7	4/4	25/25

Candidates have to choose either FLG221 (16) and FLG 222 (16) OR GTS 261 (12) as options and have to complete the option until the final year.

Compulsory credits = (112)
ELECTIVE CREDITS: GTS option - 24
FLG option - 64

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
ANA315	FORENSIC_ANTHROPOLOGY_315 Prerequisite/s: [ANA122] and [ANA215]	S1	2	1	16
ANA316	HISTOLOGY_TECHNIQUES_316 Prerequisite/s: [ANA226]	S1	2	2	16
Totals for compulsory modules in the first/second terms			4/4	3/3	16/16

Any first-semester, third-year Physiology modules and/or Pharmacology 381, with a minimum of 37 credits, OR GTS 351, GTS 352 and/or GTS 353. A total of five GTS modules (90 credits) must be taken in the third year for the GTS option.

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
ANA324	HUMAN_CELL_&_DEVEL.BIOLOGY_324 Prerequisite/s: [ANA214] and [ANA226]	S2	2	1	14
ANA327	COMPARATIVE_ANATOMY_327 Prerequisite/s: [ANA121] and [ANA122] and [ANA217] and [ANA227]	S2	1	1	14
ANA328	APPL.RESEARCH_TECHNIQUES_328 Prerequisite/s: [ANA315] and [ANA316]	S2	0	1	8
Totals for compulsory modules in the third/fourth terms			3/3	3/3	18/18

Any second-semester, third-year Physiology modules and/or Pharmacology 382, with minimum of 39 credits, OR GTS 361, GTS 363 and/or GTS 365. A total of five GTS modules (90 credits) must be taken in the third year for the GTS option.
** FLG311 must be taken by students who choose Pharmacology.
***ANA226 is required for all students with Anatomy as main subject.
**FAR 383 must be taken by students who choose FAR384.
NOTE: FLG327 Higher Neurological Functions 327 may only be taken by students with Psychology as major subject.

Compulsory credits = (68)

ELECTIVE CREDITS on third year:
GTS option - 90
FLG option - 76
A minimum of 444 credits for the GTS option is required to obtain the degree.
A minimum of 468 credits for the FLG option is required to obtain the degree.

Field of study	Dept	Code
BSc Meteorology	GGY	02133312

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
PHY171	FIRST_COURSE_IN_PHYSICS_171 Prerequisite/s: [Par 1.2]	J1	4	1	16
WKD151	ATMOSPHERIC_PROCESSES_151	K1	4	1	8
WKD152	ATMOSPHERIC_CIRC.&_CLIMATE_152	K2	4	1	8
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			16/16	3/3	29/29

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
PHY171	FIRST_COURSE_IN_PHYSICS_171 Prerequisite/s: [Par 1.2]	J1	4	1	16
WKD162	DYNAM.&_NUMER._METEOROLOGY_162	K3	4	1	8
WKD164	CLIMATE_AND_WEATHER_OF_SA_164	K4	4	0	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			14/14	3/2	25/25

Compulsory credits = (108) Elective credits = (36)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
WKD250	WEATHER_FORECASTING_250	S1	5	0	24
WKD253	COMMUNITY_PROJECT_253	S1	3	0	12
WTW218	CALCULUS_218 Prerequisite/s: [WTW114] and [WTW128]	S1	2	1	12
Totals for compulsory modules in the first/second terms			10/10	1/1	24/24

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GIS220	GEOGRAPHIC_DATA_ANALYSIS_220	S2	3	1	12
WKD261	PHYSICAL_METEOROLOGY_261	K3	4	0	12
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			9/5	2/2	22/10

Compulsory credits = (80) Elective credits = (72)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
WKD351	ATMOSPHERIC_BALANCE_LAWS_351	K1	4	1	18
WKD352	ATMOSP._VORTIC._&DIVERGENC.352	K2	4	1	18
Totals for compulsory modules in the first/second terms			4/4	1/1	18/18

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
WKD360	RESEARCH_PROJECT_360	S2	0	2	36
WKD361	QUASI-GEOSTROPHIC_ANALYSIS_361	K3	4	0	18
WKD362	CLOUD_&_BOUNDARY_LAYER_DYN.362	K4	4	0	18
Totals for compulsory modules in the third/fourth terms			4/4	2/2	36/36

Electives for the first to third year can be chosen from modules in the following departments: Geography, Geoinformatics and Meteorology, Geology, Plant Production and Soil Science, Chemistry, Plant Science, Mathematics and Applied Mathematics, Physics, Computer Science.

Compulsory credits = (108) Elective credits = (36)

A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Microbiology	MBY	03133071

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16

PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (4)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
FST250	INTRO/FOOD_SCIENCE_&_TECH._250 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S1	2	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12

MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
Totals for compulsory modules in the first/second terms			12/12	4.5/4.5	36/36

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
FST260	PRIN/FOOD_PROC._&_PRESERV._260 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S2	2	1	12
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			12/12	4.5/4.5	36/36

Compulsory credits = (144) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
MBY351	STRUCT.&_DIVERS.OF_VIRUSES_351 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S1	2	1	18
MBY352	ENVIRONMENTAL_MICROBIOLOGY_352 Prerequisite/s: [MBY161]	S1	2	1	18
MBY353	VERTIBRATE-MICROBE_INTERAC.353	S1	2	1	18
PLG351	GENERAL_PLANT_PATHOLOGY_351 Prerequisite/s: [MBY161] and [MBY261] or [TDH]	S1	2	1	18
Totals for compulsory modules in the first/second terms			8/8	4/4	36/36

PLG351 may be replaced by GTS352 or BCM351 and BCM355.

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
MBY361	TRENDS_IN_MICROBIOLOGY_361 Prerequisite/s: [BCM253 + BCM254] and [GTS261] and [MBY251]	S2	2	1	18
MBY362	FOOD_MICROBIOLOGY_362 Prerequisite/s: [MBY251]	S2	2	1	18
MBY363	MOLEC._BIOL.OF_PROKARYOTES_363 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S2	2	1	18
MBY364	GENE.MANIPULATION/MICROBES.364 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			8/8	4/4	36/36

Compulsory credits = (144) Elective credits = (0)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Nutrition and Food Science	VDW	03134012

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FSG110	PHYSIOLOGY_110	S1	3	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
VDS111	FOOD_SUPPLY_&QUALITY_CONTR.111	S1	2	1	10
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			25/25	5/5	45/45

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
FSG120	PHYSIOLOGY_120 Prerequisite/s: [FSG110 GS]	S2	3	0	6

GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			19/19	3/3	32/32

Compulsory credits = (154) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
FST250	INTRO/FOOD_SCIENCE_&_TECH._250 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S1	2	1	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
VDG311	NUTRITION_311 Prerequisite/s: [FSG110] and [FSG120] or [VDG220]	S1	3	1	17
VDS210	FOODS_210 Prerequisite/s: [VDS111]	S1	3	1	18
Totals for compulsory modules in the first/second terms			14/14	5/5	41.5/41.5

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9

BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
FST260	PRIN/FOOD_PROC._&_PRESERV._260 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S2	2	1	12
KEP220	CULTURAL_EATING_PATTERNS_220	S2	3	0	12
VDG321	NUTRIT._DURING_LIFE_CYCLE_321 Prerequisite/s: [VDG311]	S2	3	1	17
VDS221	FOODS_221 Prerequisite/s: [VDS210]	S2	3	1	18
Totals for compulsory modules in the third/fourth terms			15/15	4/4	41.5/41.5

Compulsory credits = (166) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
FST350	INTEGRATED_FOOD_SCIENCE_350 Prerequisite/s: [FST250] and [FST260] and [Second-year status] or [TDH]	J1	2	0	9
FST351	FOOD_CHEMISTRY-(1)_351 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254]	S1	2	1	18
FST352	FOOD_CHEMISTRY-(2)_352 Prerequisite/s: [BCM255 + BCM256] of [TDH] and [BCM263 + BCM264] of [TDH] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254] of [TDH]	S1	2	1	18
VDS310	FOODS_310 Prerequisite/s: [VDS210] and [VDS221]	S1	3	1	21
VVW350	COM.NUTRITION_&PUBL.HEALTH_350 Prerequisite/s: [HNT210] or [TDH] and [VDG250] and [VDG321]	S1	3	1	21
Totals for compulsory modules in the first/second terms			12/12	4/4	43.5/43.5

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
FST350	INTEGRATED_FOOD_SCIENCE_350 Prerequisite/s: [FST250] and [FST260] and [Second-year status] or [TDH]	J1	2	0	9
MBY362	FOOD_MICROBIOLOGY_362 Prerequisite/s: [MBY251]	S2	2	1	18
VVW363	FOOD,_NUTRITION_AND_HEALTH_363 Prerequisite/s: [HNT210] or [TDH] and [VDG311] and [VDG321]	S2	3	1	21

VVW364	FOOD_COMP.&_APPL_NUTR.PROG.364 Prerequisite/s: [FST351] and [FST352] or [TDH]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			9/9	3/3	33/33

Compulsory credits = (153) Elective credits = (0)
A minimum of (473) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Physics	PHY	02133202

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
PHY171	FIRST_COURSE_IN_PHYSICS_171 Prerequisite/s: [Par 1.2]	J1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			12/12	2/2	21/21

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
PHY171	FIRST_COURSE_IN_PHYSICS_171 Prerequisite/s: [Par 1.2]	J1	4	1	16
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			12/12	3/3	21/21

CMY117,127 are recommended. Electives can be chosen from: Mathematics, Meteorology, Geology, Geography, IT, Mathematical Statistics, etc.
Compulsory credits = (84) Elective credits = (68)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
PHY253	SIMULAT._USING_MATHEMATICA_253 Prerequisite/s: [PHY171] and [WTW211 #] and [WTW218 #]	K1	0	1	6

PHY254	GENERAL_PHYSICS_254 Prerequisite/s: [PHY171] and [PHY253 #] and [WTW211 #] and [WTW218 #]	S1	4	2	24
WTW211	LINEAR_ALGEBRA_211 Prerequisite/s: [WTW126]	S1	2	1	12
WTW218	CALCULUS_218 Prerequisite/s: [WTW114] and [WTW128]	S1	2	1	12
Totals for compulsory modules in the first/second terms			8/8	5/4	30/24

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
PHY263	GENERAL_PHYSICS_263 Prerequisite/s: [PHY253 GS] and [PHY254 GS] and [WTW211 GS] and [WTW218 GS] and [WTW220 #] and [WTW221 #]	S2	4	2	24
WTW220	ANALYSIS_220 Prerequisite/s: [WTW114] and [WTW128]	S2	2	1	12
WTW221	LINEAR_ALGEBRA_221 Prerequisite/s: [WTW211]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			8/8	4/4	24/24

Electives can be chosen from Mathematics, Meteorology, Geology, Geography, IT and Mathematical Statistics.

Compulsory credits = (102) Elective credits = (42)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
PHY354	ELECTRONICS_&_ELECTROMAGN._354 Prerequisite/s: [PHY254 GS] and [WTW218 GS]	K1	4	2	18
PHY355	QUANTUM_MECHAN.&_MODELLING_355 Prerequisite/s: [PHY253 GS] and [PHY254 GS] and [PHY263 GS] and [WTW221 GS]	K2	4	2	18
Totals for compulsory modules in the first/second terms			4/4	2/2	18/18

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
PHY364	GENERAL_PHYSICS_364 Prerequisite/s: [PHY253 GS] and [PHY254 GS] and [PHY263 GS] and [PHY354 GS] and [PHY355 GS] and [WTW221 GS]	S2	4	2	36
Totals for compulsory modules in the third/fourth terms			4/4	2/2	18/18

PHY353 and/or PHY363 can be chosen as elective modules.

Compulsory credits = (72) Elective credits = (72)

A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Plant Pathology	MBY	03134001

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3

BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
ZEN251	INVERTEBRATE_BIOLOGY_251 Prerequisite/s: [ZEN161 GS] or [TDH]	K1	4	1	12
Totals for compulsory modules in the first/second terms			14/10	4.5/3.5	42/30

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
GTS366	PLANT_GENETICS_&_BIOTECHN._366 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH] and [GTS351 is recommended] and [GTS352 is recommended]	S2	2	1	18
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			12/12	4.5/4.5	39/39

ZEN261 may be selected instead of GTS366.

Compulsory credits = (150) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT356	PLANT_ECOPHYSIOLOGY_356 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
MBY351	STRUCT.&_DIVERS.OF_VIRUSES_351 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S1	2	1	18
MBY352	ENVIRONMENTAL_MICROBIOLOGY_352 Prerequisite/s: [MBY161]	S1	2	1	18
PLG351	GENERAL_PLANT_PATHOLOGY_351 Prerequisite/s: [MBY161] and [MBY261] or [TDH]	S1	2	1	18
Totals for compulsory modules in the first/second terms			8/8	4/4	36/36

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
MBY363	MOLEC._BIOL.OF_PROKARYOTES_363 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S2	2	1	18
MBY364	GENE.MANIPULATION/MICROBES.364 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S2	2	1	18
PLG363	PLANT_DISEASE_CONTROL_363	S2	2	1	18
PLG364	HOST_PATHOGEN_INTERACTIONS_364	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			8/8	4/4	36/36

Compulsory credits = (144) Elective credits = (0)
A minimum of (442) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Plant Science	BOT	03133091

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (4)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
ZEN251	INVERTEBRATE_BIOLOGY_251 Prerequisite/s: [ZEN161 GS] or [TDH]	K1	4	1	12
Totals for compulsory modules in the first/second terms			12/8	4/3	30/18
Students specialising in plant ecology/taxonomy: Replace BCM255 and BCM256 with GKD250.					

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12

GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
ZEN261	AFRICAN_VERTEBRATES_261 Prerequisite/s: [ZEN161 GS] or [TDH]	K3	4	1	12
Totals for compulsory modules in the third/fourth terms			14/10	4.5/3.5	38/26

Students NOT specialising in plant ecology/taxonomy: Replace GLY 161 and GLY 162 with either PLG 262 or HSC 260 and an additional elective module with at least 4 credits.
Compulsory credits = (124) Elective credits = (20)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT356	PLANT_ECOPHYSIOLOGY_356 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
BOT357	CROP_BIOTECHNOLOGY_357 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
BOT358	PLANT_ECOLOGY_358 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
Totals for compulsory modules in the first/second terms			6/6	3/3	27/27

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT365	PHYTOMEDICINE_365 Prerequisite/s: [BOT161] or [TDH]	S2	2	1	18
BOT366	PLANT_DIVERSITY_366 Prerequisite/s: [BOT161] or [TDH]	S2	2	0	10
BOT367	PRACT_PLANT_IDENTIFICATION_367 Prerequisite/s: [BOT161] or [TDH]	S2	0	1	10
Totals for compulsory modules in the third/fourth terms			4/4	2/2	19/19

Plant Ecology specialisation: Students take ZEN364(18) and suitable elective modules.
Compulsory credits = (92) Elective credits = (52)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Soil Science	PGW	03133061

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW114	CALCULUS_114 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
WTW126	LINEAR_ALGEBRA_126 Prerequisite/s: [Par 1.2]	S2	2	1	8
WTW128	CALCULUS_128 Prerequisite/s: [WTW114 GS]	S2	2	1	8
Totals for compulsory modules in the third/fourth terms			16/16	4/4	29/29

Electives can be chosen from the following: GTS161, ZEN161, AGC161, FBS120, GGY162, 164.

Compulsory credits = (132) Elective credits = (20)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CMY282	PHYSICAL_CHEMISTRY_282 Prerequisite/s: [CMY117] and [CMY127]	S1	2	0.5	12
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
GLY151	INTRODUCTORY_GEOLOGY_151 Prerequisite/s: [Par 1.2]	K1	4	1	8
GLY152	PHYSICAL_GEOLOGY_152 Prerequisite/s: [Par 1.2]	K2	4	1	8
Totals for compulsory modules in the first/second terms			9/9	2.5/2.5	20/20

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
CMY283	ANALYTICAL_CHEMISTRY_283 Prerequisite/s: [CMY117] and [CMY127]	S2	2	0.5	12
GKD260	SOIL_FERTIL.&_PLANT_NUTRIT.260 Prerequisite/s: [GKD250 GS]	S2	3	1	12
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
Totals for compulsory modules in the third/fourth terms			13/13	3.5/3.5	28/28

Electives: Any module(s) in the Faculty of Natural and Agricultural Sciences after consultation with the heads of department.
Compulsory credits = (96) Elective credits = (48)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GKD350	SOIL_CLASSIF.&_SURVEYING_350 Prerequisite/s: [GKD250 GS]	S1	2	1	14
GKD351	SOIL_PHYSICS_351 Prerequisite/s: [GKD250]	S1	1	0.5	10
Totals for compulsory modules in the first/second terms			3/3	1.5/1.5	12/12

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GKD320	SOIL_CHEMISTRY_320 Prerequisite/s: [GKD250]	S2	2	1	14
GKD461	SOIL_MINEROL.&SOIL_GENESIS_461	S2	2	1	14
Totals for compulsory modules in the third/fourth terms			4/4	2/2	14/14

Electives: Any module(s) in the Faculty of Natural and Agricultural Sciences after consultation with the heads of department.
Compulsory credits = (52) Elective credits = (92)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Veterinary Biology	GTS	03134003

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9

BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
VDG250	NUTRITION_250 Prerequisite/s: [CMY127]	S1	3	0.5	12
VKU210	ANIMAL_SCIENCE_210 Prerequisite/s: [GTS161]	S1	1	0.5	6
Totals for compulsory modules in the first/second terms			12/12	3.5/3.5	33/33
Electives can be chosen from BOT251 and BOT261or ZEN251 and ZEN261 or DAF200					

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
VKU220	ANIMAL_SCIENCE_220 Prerequisite/s: [VKU210 GS] or [TDH]	S2	2	0.5	12
VKU222	ANIMAL_SCIENCE_222	S2	2	0	6
Totals for compulsory modules in the third/fourth terms			12/12	3/3	33/33

A first-round selection process for the degree BSc:Veterinary Biology will take place at the end of the second year of study provided a candidate had passed the prescribed modules. Students not selected at the end of the second year will be able to continue in their third year with any one of a number of different degree options including a three-year BSc degree with options in either Animal Sciences, Plant Science, Biotechnology, Entomology, Genetics, Microbiology, Zoology, or alternatively a BSc(Agric) in Animal Science. However, it may be necessary to register for additional outstanding prescribed modules. Electives to be chosen from the following list of second-year subjects: BOT261 and ZEN261.

Compulsory credits = (132) Elective credits = (24)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM355	IMMUNOBIOLOGY_355 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]	S1	1	0.5	9
MBY354	VETERINARY_VIROLOGY_354 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S1	2	0	9
PAS300	PROD.ANIM.BEHAV.HAND.&WELF.300 Prerequisite/s: [Only students selected for BSc: Veterinary Biology]	J1	1	1	6
VAP300	VET.ANATOMY_&_PHYSIOLOGY_300 Prerequisite/s: [Only students selected for BSc(Veterinary Biology)III]	J1	10	2	36
WDE310	PRINCIPLES_OF_VELD_MANAGE_310	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			16/16	4/4	36/36

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
APZ325	LIVESTOCK_BREEDING_325 Prerequisite/s: [GTS261]	S2	2	0	10
PAS300	PROD.ANIM.BEHAV.HAND.&WELF.300 Prerequisite/s: [Only students selected for BSc: Veterinary Biology]	J1	1	1	6
VAP300	VET.ANATOMY_&_PHYSIOLOGY_300 Prerequisite/s: [Only students selected for BSc(Veterinary Biology)III]	J1	10	2	36
VKU320	ANIMAL_SCIENCE_320 Prerequisite/s: [VKU210] and [VKU220] and [WDE310]	S2	3	1	12
VKU361	ANIMAL_ECOLOGY_361 Prerequisite/s: [TDH]	S2	2	0	8
Totals for compulsory modules in the third/fourth terms			18/18	4/4	36/36

A final selection of candidates who will be admitted to the BVSc programme will be made at the end of the third year, based on academic merit and according to available capacity. Students not selected at the end of the third year of study or who do not wish to continue with the BVSc degree, will be able to apply for admission to continue with an honours degree in Anatomy, Physiology or an honours degree in one of the Biological or Agricultural Sciences programmes after completion of a number of specified additional third-year modules in that discipline.

Compulsory credits = (144) Elective credits = (0)

A minimum of (448) credits is required to obtain the degree.

Field of study	Dept	Code
BSc Zoology	ZEN	03133021

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9

BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
ZEN251	INVERTEBRATE_BIOLOGY_251 Prerequisite/s: [ZEN161 GS] or [TDH]	K1	4	1	12
Totals for compulsory modules in the first/second terms			14/10	4.5/3.5	42/30

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
ZEN261	AFRICAN_VERTEBRATES_261 Prerequisite/s: [ZEN161 GS] or [TDH]	K3	4	1	12
Totals for compulsory modules in the third/fourth terms			14/10	4.5/3.5	38/26

Compulsory credits = (136) Elective credits = (12)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
ZEN351	POPULATION_ECOLOGY_351	K1	4	2	18
ZEN352	MAMMALOGY_352	K1	4	2	18
ZEN353	COMMUNITY_ECOLOGY_353	K2	4	2	18
ZEN354	PHYSIOLOGY_354	K2	4	2	18
Totals for compulsory modules in the first/second terms			8/8	4/4	36/36

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
ZEN361	ECOPHYSIOLOGY_361	K3	4	2	18
ZEN362	EVOLUTION_AND_PHYLOGENY_362	K3	4	2	18
ZEN363	BEHAVIOURAL_ECOLOGY_363	K4	4	2	18
ZEN364	CONSERVATION_ECOLOGY_364	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			8/8	4/4	36/36

Compulsory credits = (144) Elective credits = (0)
A minimum of (440) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Agricultural Economics/Agribusiness management	LEK	03130050

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FRK111	FINANCIAL_ACCOUNTING_111 Prerequisite/s: [Par.1.2]	S1	4	0	10
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	3/3	34/34

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
FRK121	FINANCIAL_ACCOUNTING_121 Prerequisite/s: [FRK111 GS]	S2	4	0	12
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			16/16	2/2	27/27
Compulsory credits = (122) Elective credits = (0)					

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
EKN110	ECONOMICS_110	S1	3	0	10
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
PPK251	SUSTAINABLE_PRODUCTION_SYS.251 Prerequisite/s: [BOT161]	S1	2	0.5	12
STK110	STATISTICS_110 Prerequisite/s: [Par 1.2]	S1	3	1	13
VKU210	ANIMAL_SCIENCE_210 Prerequisite/s: [GTS161]	S1	1	0.5	6
Totals for compulsory modules in the first/second terms			15/15	3/3	32.5/32.5

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
EKN120	ECONOMICS_120 Prerequisite/s: [EKN110 GS or EKN113 GS] and [Par 1.2]	S2	3	0	10
HSC260	CROP_PROPAGATION_260 Prerequisite/s: [BOT161]	S2	2	0.5	12
LBU260	AGROCLIMATOLOGY_260	S2	2	0.5	12
LEK220	AGRICULTURAL_ECONOMICS_220 Prerequisite/s: [LEK251] and [LEK252] or [EKN113 and/or EKN120]	S2	3	0	12
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10
STK120	STATISTICS_120 Prerequisite/s: [STK110 GS]	S2	3	1	13
VKU220	ANIMAL_SCIENCE_220 Prerequisite/s: [VKU210 GS] or [TDH]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			18/18	2.5/2.5	40.5/40.5

Compulsory credits = (146) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BER210	BUSINESS_LAW_210	S1	3	0	16
EKN214	ECONOMICS_214 Prerequisite/s: [EKN110 GS] and [EKN120 or EKN113 GS + EKN123] and [EKN120 GS] and [STK110 GS]	S1	3	0	16
FST250	INTRO/FOOD_SCIENCE_&_TECH._250 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S1	2	1	12

LEK310	AGRICULTURAL_ECONOMICS_310 Prerequisite/s: [LEK251 or EKN110] and [LEK252 or EKN120]	S1	3	0	12
STK210	STATISTICS_210 Prerequisite/s: [STK110] and [STK120]	S1	3	1	20
Totals for compulsory modules in the first/second terms			14/14	2/2	38/38
EKN215 is recommended as an elective.					

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
AGV421	COMMUNICATION_421	S2	2	0	20
BEL220	TAXATION_220	S2	3	0	16
EKN224	ECONOMICS_224 Prerequisite/s: [EKN110 or EKN113] and [EKN214 GS] and [STK110]	S2	3	0	16
LEK320	AGRICULTURAL_ECONOMICS_320 Prerequisite/s: [LEK220] and [LEK251] and [LEK252]	S2	3	2	18
STK281	STATISTICS_281 Prerequisite/s: [STK110] and [STK120]	S2	2	1	10
Totals for compulsory modules in the third/fourth terms			13/13	3/3	40/40

Compulsory credits = (156) Elective credits = (37)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
ARD480	AGRIC.&_RURAL_DEVELOP.STUD.480	J1	3	0	20
EKN314	ECONOMICS_314 Prerequisite/s: [EKN214] and [EKN224] and [STK120]	S1	3	0	20
LEK415	AGRICULTURAL_ECONOMICS_415 Prerequisite/s: [EKN110] and [LEK220] and [WTW134]	S1	3	1	18
LEK451	AGRI.DEMAND_&_SUPP.ANALYSIS_451 Prerequisite/s: [LEK220] and [LEK252] and [STK281]	K1	3	2	12
LEK452	COMMODITY_PRICE_ANALYSIS_452 Prerequisite/s: [LEK220] and [LEK252] and [LEK451] and [STK281]	K2	3	2	12
Totals for compulsory modules in the first/second terms			12/12	3/3	41/41

Fourth year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
ARD480	AGRIC.&_RURAL_DEVELOP.STUD.480	J1	3	0	20
LEK421	AGRICULTURAL_ECONOMICS_421 Prerequisite/s: [LEK451] and [STK210] and [STK281]	S2	3	2	24
LEK424	INTRODUCT.TO_RESOURCE_ECON.424 Prerequisite/s: [LEK251] and [LEK252]	S2	3	0	15
Totals for compulsory modules in the third/fourth terms			9/9	2/2	29.5/29.5

Elective modules can be chosen from the following: STK310, STK320, WDE320, EKN325, and any modules from Animal and Wildlife Sciences that do not clash on the lecture, practical or examination time-table.
Compulsory credits = (141) Elective credits = (20)
A minimum of (622) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Animal Science	VKU	03130140

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
PPK251	SUSTAINABLE_PRODUCTION_SYS.251 Prerequisite/s: [BOT161]	S1	2	0.5	12
VDG250	NUTRITION_250 Prerequisite/s: [CMY127]	S1	3	0.5	12
VKU210	ANIMAL_SCIENCE_210 Prerequisite/s: [GTS161]	S1	1	0.5	6
Totals for compulsory modules in the first/second terms			22/19	5/5	54/48

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18

GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
LBU260	AGROCLIMATOLOGY_260	S2	2	0.5	12
VKU220	ANIMAL_SCIENCE_220 Prerequisite/s: [VKU210 GS] or [TDH]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			14/14	3.5/3.5	39/39

Compulsory credits = (180) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BME210	BIOMETRY_210 Prerequisite/s: [BME120]	S1	4	1	24
DAN310	ANIMAL_ANATOMY_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
DFS311	ANIMAL_PHYSIOLOGY_311 Prerequisite/s: [DAF200]	S1	2	0	10
RPL310	REPRODUCTION_SCIENCE_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16
WDE310	PRINCIPLES_OF_VELD_MANAGE_310	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			13/13	3/3	39/39

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
DFS320	GROWTH_PHYSIOLOGY_320 Prerequisite/s: [TDH]	S2	2	0.5	10
RPL320	REPRODUCTION_SCIENCE_320 Prerequisite/s: [RPL310]	S2	2	0.5	10
TLR320	ANIMAL_BREEDING_320 Prerequisite/s: [GTS261]	S2	2	0.5	10
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16
VKU361	ANIMAL_ECOLOGY_361 Prerequisite/s: [TDH]	S2	2	0	8
VKU362	ANIMAL_SCI._BIOTECHNOLOGY_362 Prerequisite/s: [GTS261]	S2	1	0	8
WDE320	PLANTED_PAST_&_FODDERCROPS_320 Prerequisite/s: [WDE310]	S2	2	0.5	14
Totals for compulsory modules in the third/fourth terms			14/14	2.5/2.5	38/38

Compulsory credits = (154) Elective credits = (0)

Fourth year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GVK420	LARGE_STOCK_SCIENCE_420 Prerequisite/s: [RPL320] and [VGE301] and [VKU210]	S1	2	0.5	12
PVK420	POULTRY_SCIENCE_420 Prerequisite/s: [LEK210] and [VGE301] and [VKU220]	S1	2	0.5	12
TLR411	ANIMAL_BREEDING_411 Prerequisite/s: [TLR320]	S1	2	0.5	12
VGE423	NUTRITION_SCIENCE_423 Prerequisite/s: [VGE301]	S1	3	0	16
VKF411	ANIMAL_SCI.PHARMACOLOGY_411 Prerequisite/s: [DFS320] and [VGE301]	S1	3	0	12
VKU411	SEMINAR_411 Prerequisite/s: [TDH]	S1	1	0	8
VKU412	RESEARCH_METHODOLOGY_412 Prerequisite/s: [TDH]	S1	1	0	8
WLK410	WOOL_SCIENCE_410	S1	1	0.5	8
Totals for compulsory modules in the first/second terms			15/15	2/2	44/44

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
KVK420	SMALL_STOCK_SCIENCE_420 Prerequisite/s: [RPL320] and [VGE301] and [VKU220]	S2	2	0.5	12
TLR420	ANIMAL_BREEDING_420 Prerequisite/s: [TLR411]	S2	2	0.5	12
VGE411	NUTRITION_SCIENCE_411 Prerequisite/s: [VGE301]	S2	4	0.5	18
VGE421	NUTRITION_SCIENCE_421 Prerequisite/s: [VGE301]	S2	3	0.5	16
VKD410	PIG_SCIENCE_410 Prerequisite/s: [VGE301] and [VKU220]	S2	1	0.5	8
VSX420	MEAT_AND_DAIRY_SCIENCE_420 Prerequisite/s: [DFS320]	S2	2	0	10
WKE420	WILDLIFE_SCIENCE_420 Prerequisite/s: [VGE301] and [VKU361] or [TDH]	S2	2	0	10
Totals for compulsory modules in the third/fourth terms			16/16	2.5/2.5	43/43

Compulsory credits = (174) Elective credits = (0)
A minimum of (656) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Animal Science/ Animal Genetics	VKU	03130251

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3

BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18
GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
PPK251	SUSTAINABLE_PRODUCTION_SYS.251 Prerequisite/s: [BOT161]	S1	2	0.5	12
VDG250	NUTRITION_250 Prerequisite/s: [CMY127]	S1	3	0.5	12
VKU210	ANIMAL_SCIENCE_210 Prerequisite/s: [GTS161]	S1	1	0.5	6
Totals for compulsory modules in the first/second terms			16/16	4/4	42/42

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
LBU260	AGROCLIMATOLOGY_260	S2	2	0.5	12
VKU220	ANIMAL_SCIENCE_220 Prerequisite/s: [VKU210 GS] or [TDH]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			14/14	3.5/3.5	39/39

Compulsory credits = (162) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BME210	BIOMETRY_210 Prerequisite/s: [BME120]	S1	4	1	24

DAN310	ANIMAL_ANATOMY_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
DFS311	ANIMAL_PHYSIOLOGY_311 Prerequisite/s: [DAF200]	S1	2	0	10
GTS352	GENOMES_352 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
RPL310	REPRODUCTION_SCIENCE_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16
Totals for compulsory modules in the first/second terms			13/13	3.5/3.5	42/42

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
DFS320	GROWTH_PHYSIOLOGY_320 Prerequisite/s: [TDH]	S2	2	0.5	10
GTS361	HUMAN_GENETICS_361 Prerequisite/s: [GTS352 GS] or [TDH]	K3	4	2	18
RPL320	REPRODUCTION_SCIENCE_320 Prerequisite/s: [RPL310]	S2	2	0.5	10
TLR320	ANIMAL_BREEDING_320 Prerequisite/s: [GTS261]	S2	2	0.5	10
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16
VKU361	ANIMAL_ECOLOGY_361 Prerequisite/s: [TDH]	S2	2	0	8
VKU362	ANIMAL_SCI._BIOTECHNOLOGY_362 Prerequisite/s: [GTS261]	S2	1	0	8
Totals for compulsory modules in the third/fourth terms			16/12	4/2	49/31

Compulsory credits = (164) Elective credits = (0)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
GTS353	ADV._POPULATION_GENETICS_353 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH]	S1	2	1	18
GVK420	LARGE_STOCK_SCIENCE_420 Prerequisite/s: [RPL320] and [VGE301] and [VKU210]	S1	2	0.5	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
PVK420	POULTRY_SCIENCE_420 Prerequisite/s: [LEK210] and [VGE301] and [VKU220]	S1	2	0.5	12

TLR411	ANIMAL_BREEDING_411 Prerequisite/s: [TLR320]	S1	2	0.5	12
VKF411	ANIMAL_SCI.PHARMACOLOGY_411 Prerequisite/s: [DFS320] and [VGE301]	S1	3	0	12
VKU411	SEMINAR_411 Prerequisite/s: [TDH]	S1	1	0	8
VKU412	RESEARCH_METHODOLOGY_412 Prerequisite/s: [TDH]	S1	1	0	8
Totals for compulsory modules in the first/second terms			16/16	2.5/2.5	47/47

Fourth year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
GTS363	EVOLUTIO._&_PHYLO-GENETICS_363 Prerequisite/s: [GTS353 GS] or [TDH]	S2	2	1	18
KVK420	SMALL_STOCK_SCIENCE_420 Prerequisite/s: [RPL320] and [VGE301] and [VKU220]	S2	2	0.5	12
LEK320	AGRICULTURAL_ECONOMICS_320 Prerequisite/s: [LEK220] and [LEK251] and [LEK252]	S2	3	2	18
TLR420	ANIMAL_BREEDING_420 Prerequisite/s: [TLR411]	S2	2	0.5	12
VKD410	PIG_SCIENCE_410 Prerequisite/s: [VGE301] and [VKU220]	S2	1	0.5	8
WKE420	WILDLIFE_SCIENCE_420 Prerequisite/s: [VGE301] and [VKU361] or [TDH]	S2	2	0	10
Totals for compulsory modules in the third/fourth terms			12/12	4.5/4.5	39/39

Compulsory credits = (172) Elective credits = (0)

A minimum of (646) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Animal Science/ Pasture Science	VKU	03130250

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BOT251	SA_FLORA_&_VEGETATION_251 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	12
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18
PPK251	SUSTAINABLE_PRODUCTION_SYS.251 Prerequisite/s: [BOT161]	S1	2	0.5	12
VDG250	NUTRITION_250 Prerequisite/s: [CMY127]	S1	3	0.5	12
VKU210	ANIMAL_SCIENCE_210 Prerequisite/s: [GTS161]	S1	1	0.5	6
Totals for compulsory modules in the first/second terms			16/16	4.5/4.5	42/42

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 Prerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
DAF200	ANIMAL_ANATOMY&PHYSIOLOGY_200 Prerequisite/s: [CMY127] or [TDH]	J1	4	1	18
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
LBU260	AGROCLIMATOLOGY_260	S2	2	0.5	12
VKU220	ANIMAL_SCIENCE_220 Prerequisite/s: [VKU210 GS] or [TDH]	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			16/16	4.5/4.5	45/45

Compulsory credits = (174) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
DAN310	ANIMAL_ANATOMY_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
DFS311	ANIMAL_PHYSIOLOGY_311 Prerequisite/s: [DAF200]	S1	2	0	10
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
RPL310	REPRODUCTION_SCIENCE_310 Prerequisite/s: [DAF200]	S1	1	0.5	8
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16

WDE310	PRINCIPLES_OF_VELD_MANAGE_310	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			15/15	3/3	39/39

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
DFS320	GROWTH_PHYSIOLOGY_320 Prerequisite/s: [TDH]	S2	2	0.5	10
GKD260	SOIL_FERTIL.&_PLANT_NUTRIT.260 Prerequisite/s: [GKD250 GS]	S2	3	1	12
RPL320	REPRODUCTION_SCIENCE_320 Prerequisite/s: [RPL310]	S2	2	0.5	10
TLR320	ANIMAL_BREEDING_320 Prerequisite/s: [GTS261]	S2	2	0.5	10
VGE301	NUTRITION_SCIENCE_301 Prerequisite/s: [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]	J1	3	0.5	16
WDE320	PLANTED_PAST_&_FODDERCROPS_320 Prerequisite/s: [WDE310]	S2	2	0.5	14
Totals for compulsory modules in the third/fourth terms			14/14	3.5/3.5	36/36

Compulsory credits = (150) Elective credits = (0)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BME210	BIOMETRY_210 Prerequisite/s: [BME120]	S1	4	1	24
GKD350	SOIL_CLASSIF.&_SURVEYING_350 Prerequisite/s: [GKD250 GS]	S1	2	1	14
GVK420	LARGE_STOCK_SCIENCE_420 Prerequisite/s: [RPL320] and [VGE301] and [VKU210]	S1	2	0.5	12
VGE423	NUTRITION_SCIENCE_423 Prerequisite/s: [VGE301]	S1	3	0	16
VKU411	SEMINAR_411 Prerequisite/s: [TDH]	S1	1	0	8
VKU412	RESEARCH_METHODOLOGY_412 Prerequisite/s: [TDH]	S1	1	0	8
WDE450	EVALUAT.OF_RANGE_&_FORAGES_450	S1	3	0.5	14
Totals for compulsory modules in the first/second terms			16/16	3/3	48/48

Fourth year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
APS461	CROP_PHYSIOLOGY_461 Prerequisite/s: [GKD250] and [GKD260] and [HSC260] and [PGW350]	S2	2	0.5	14
KVK420	SMALL_STOCK_SCIENCE_420 Prerequisite/s: [RPL320] and [VGE301] and [VKU220]	S2	2	0.5	12

VGE411	NUTRITION_SCIENCE_411 Prerequisite/s: [VGE301]	S2	4	0.5	18
VGE421	NUTRITION_SCIENCE_421 Prerequisite/s: [VGE301]	S2	3	0.5	16
VSX420	MEAT_AND_DAIRY_SCIENCE_420 Prerequisite/s: [DFS320]	S2	2	0	10
WKE420	WILDLIFE_SCIENCE_420 Prerequisite/s: [VGE301] and [VKU361] or [TDH]	S2	2	0	10
Totals for compulsory modules in the third/fourth terms			15/15	2/2	40/40

Compulsory credits = (176) Elective credits = (14)
A minimum of (661) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Food Science and Technology	VDW	03130370

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37
Compulsory credits = (148) Elective credits = (4)					

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BCM255	CARBOHYDRATE_METABOLISM_255 Prerequisite/s: [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM256	PRAC:CARBOHYDRATE_METABOL._256 Prerequisite/s: [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
FST250	INTRO/FOOD_SCIENCE_&_TECH._250 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S1	2	1	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
VDG250	NUTRITION_250 Prerequisite/s: [CMY127]	S1	3	0.5	12
Totals for compulsory modules in the first/second terms			14/14	3.5/3.5	36/36

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM263	LIPID_&_NITROGEN_METABOLI._263 Prerequisite/s: [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM264	PRAC:LIPID_&_NITROG.METABO.264 rerequisite/s: [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
BCM265	BIOCHEMISTRY_IN_PERSPECT_265 Prerequisite/s: [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	2	0	9
BCM266	PRAC:BCM_IN_PERSPECTIVE_266 Prerequisite/s: [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S2	0	0.5	3
FST260	PRIN/FOOD_PROC._&_PRESERV._260 Prerequisite/s: [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]	S2	2	1	12
LEK220	AGRICULTURAL_ECONOMICS_220 Prerequisite/s: [LEK251] and [LEK252] or [EKN113 and/or EKN120]	S2	3	0	12

MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			11/11	3/3	30/30

Compulsory credits = (132) Elective credits = (12)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
FST350	INTEGRATED_FOOD_SCIENCE_350 Prerequisite/s: [FST250] and [FST260] and [Second-year status] or [TDH]	J1	2	0	9
FST351	FOOD_CHEMISTRY-(1)_351 Prerequisite/s: [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254]	S1	2	1	18
FST352	FOOD_CHEMISTRY-(2)_352 Prerequisite/s: [BCM255 + BCM256] of [TDH] and [BCM263 + BCM264] of [TDH] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254] of [TDH]	S1	2	1	18
FST353	FOOD_ENGINEERING_353 Prerequisite/s: [FST260] or [TDH]	S1	3	0.5	18
Totals for compulsory modules in the first/second terms			9/9	2.5/2.5	31.5/31.5

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
FST350	INTEGRATED_FOOD_SCIENCE_350 Prerequisite/s: [FST250] and [FST260] and [Second-year status] or [TDH]	J1	2	0	9
FST360	PRINC_SCI_&TECH_PLANT FOOD_360 Prerequisite/s: [FST250] and [FST260] and [FST351] and [FST352] or [TDH]	S2	2	1	18
FST361	ANIMAL_FOOD_SCIENCE_361 Prerequisite/s: [FST250] and [FST260] and [FST351] and [FST352] or [TDH]	S2	2	1	18
LEK320	AGRICULTURAL_ECONOMICS_320 Prerequisite/s: [LEK220] and [LEK251] and [LEK252]	S2	3	2	18
MBY362	FOOD_MICROBIOLOGY_362 Prerequisite/s: [MBY251]	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			11/11	5/5	40.5/40.5

Compulsory credits = (144) Elective credits = (0)

Fourth year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
FST400	RESEARCH_METHODOLOGY_&_SEM.400 Prerequisite/s: [Third-year status] or [TDH]	J1	2	1	10
FST401	ANIMAL_FOOD_TECHNOLOGY_401 Prerequisite/s: [FST361] or [TDH]	J1	2	1	10
FST402	ADV_PLANT_FOOD_SCI_&TECHN_402 Prerequisite/s: [FST360] or [TDH]	J1	2	1	10
FST412	SENSORY_ANALYSIS_412 Prerequisite/s: [FST260] and [FST351] and [FST352] or [TDH]	S1	1	1	10
FST413	PRODUCT_DEV.&_QUALITY_MAN._413 Prerequisite/s: [FST260] or [TDH] and [FST351] and [FST352]	S1	3	1	30
FST420	ADVANCED_FOOD_SCIENCE_420 Prerequisite/s: [Third-year status] or [TDH]	J1	2	0	10
FST463	RESEARCH_PROJECT_463 Prerequisite/s: [Third-year status in Food Science or TDH]	J1	0	1	20
Totals for compulsory modules in the first/second terms			12/12	6/6	50/50

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
FST400	RESEARCH_METHODOLOGY_&_SEM.400 Prerequisite/s: [Third-year status] or [TDH]	J1	2	1	10
FST401	ANIMAL_FOOD_TECHNOLOGY_401 Prerequisite/s: [FST361] or [TDH]	J1	2	1	10
FST402	ADV_PLANT_FOOD_SCI_&TECHN_402 Prerequisite/s: [FST360] or [TDH]	J1	2	1	10
FST420	ADVANCED_FOOD_SCIENCE_420 Prerequisite/s: [Third-year status] or [TDH]	J1	2	0	10
FST463	RESEARCH_PROJECT_463 Prerequisite/s: [Third-year status in Food Science or TDH]	J1	0	1	20
Totals for compulsory modules in the third/fourth terms			8/8	4/4	30/30

Compulsory credits = (160) Elective credits = (0)
A minimum of (600) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Plant Pathology	MBY	03130321

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12

GTS251	GENE_&_CHROMOSOME_ORGANIZ._251 Prerequisite/s: [GTS161 GS] or [TDH]	S1	2	0.5	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
PLG251	INTRODUCT._CROP_PROTECTION_251	S1	2	1	12
Totals for compulsory modules in the first/second terms			12/12	3/3	30/30

Plant Protection focus: GTS251 may be replaced with FST250.

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GKD260	SOIL_FERTIL.&_PLANT_NUTRIT.260 Prerequisite/s: [GKD250 GS]	S2	3	1	12
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
HSC260	CROP_PROPAGATION_260 Prerequisite/s: [BOT161]	S2	2	0.5	12
LEK220	AGRICULTURAL_ECONOMICS_220 Prerequisite/s: [LEK251] and [LEK252] or [EKN113 and/or EKN120]	S2	3	0	12
MBY261	GROWTH_ACT.&_CONTROL/FUNGI_261 Prerequisite/s: [MBY161]	S2	2	1	12
PLG262	PRINCIPLES_OF_PLANT_PATHOL.262 Prerequisite/s: [MBY161]	S2	2	1	12
Totals for compulsory modules in the third/fourth terms			16/16	5/5	42/42

Compulsory credits = (144) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT356	PLANT_ECOPHYSIOLOGY_356 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
MBY251	GROWTH_DIVERS.&CONTROL/BAC.251 Prerequisite/s: [MBY161 GS]	S1	2	1	12
MBY351	STRUCT.&_DIVERS.OF_VIRUSES_351 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S1	2	1	18
PLG351	GENERAL_PLANT_PATHOLOGY_351 Prerequisite/s: [MBY161] and [MBY261] or [TDH]	S1	2	1	18
PPK251	SUSTAINABLE_PRODUCTION_SYS.251 Prerequisite/s: [BOT161]	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			10/10	4.5/4.5	39/39

MBY351 may be replaced with HSC351 and an additional elective of 4 credits.

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
GTS366	PLANT_GENETICS_&_BIOTECHN._366 Prerequisite/s: [GTS251 GS] and [GTS261 GS] or [TDH] and [GTS351 is recommended] and [GTS352 is recommended]	S2	2	1	18
MBY364	GENE.MANIPULATION/MICROBES.364 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S2	2	1	18
PLG363	PLANT_DISEASE_CONTROL_363	S2	2	1	18
PLG364	HOST_PATHOGEN_INTERACTIONS_364	S2	2	1	18
Totals for compulsory modules in the third/fourth terms			8/8	4/4	36/36

Plant Protection focus: MBY364 and GTS366 may be replaced with MBY362 and BOT365.
Compulsory credits = (150) Elective credits = (0)

Fourth year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME210	BIOMETRY_210 Prerequisite/s: [BME120]	S1	4	1	24
MBY352	ENVIRONMENTAL_MICROBIOLOGY_352 Prerequisite/s: [MBY161]	S1	2	1	18
OKW413	WEED_SCIENCE_413 Prerequisite/s: [PPK251]	S1	2	0.5	14
PGW400	SEMINAR_400	J1	1	0	10
PLG462	RESEARCH_PROJECT_462	J1	1	1	10
Totals for compulsory modules in the first/second terms			10/10	3.5/3.5	38/38

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
LBU260	AGROCLIMATOLOGY_260	S2	2	0.5	12
MBY363	MOLEC._BIOL.OF_PROKARYOTES_363 Prerequisite/s: [BCM253 + BCM254] and [CMY127] and [MBY161]	S2	2	1	18
PGW400	SEMINAR_400	J1	1	0	10
PGW421	EXPERIMENTAL_DESIGN_&_ANAL.421 Prerequisite/s: [BME120]	S2	2	0.5	14
PLG461	NURSERY_&_SEED_PATHOLOGY_461	S2	1	0.5	10
PLG462	RESEARCH_PROJECT_462	J1	1	1	10
ZEN365	INSECT_PEST_MANAGEMENT_365	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			9/13	3.5/5.5	37/55

Compulsory credits = (168) Elective credits = (0)
A minimum of (610) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Plant Production	PGW	03130161

First year, first semester:

Students who want to enroll for the main subjects: Agronomy, Horticulture or Pasture Science, must register for the BSc(Agric) Plant Production degree.

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8
ZEN161	ANIMAL_DIVERSITY_161 /s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
BME210	BIOMETRY_210 Prerequisite/s: [BME120]	S1	4	1	24
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
PLG251	INTRODUCT._CROP_PROTECTION_251	S1	2	1	12
PPK251	SUSTAINABLE_PRODUCTION_SYS.251 Prerequisite/s: [BOT161]	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			16/16	4/4	42/42

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
GKD260	SOIL_FERTIL.&_PLANT_NUTRIT.260 Prerequisite/s: [GKD250 GS]	S2	3	1	12
GTS261	GENETIC_ANAL._&_MANIPULA._261 Prerequisite/s: [GTS161 GS] or [TDH]	S2	2	0.5	12
HSC260	CROP_PROPAGATION_260 Prerequisite/s: [BOT161]	S2	2	0.5	12
LBU260	AGROCLIMATOLOGY_260	S2	2	0.5	12
LEK220	AGRICULTURAL_ECONOMICS_220 Prerequisite/s: [LEK251] and [LEK252] or [EKN113 and/or EKN120]	S2	3	0	12
Totals for compulsory modules in the third/fourth terms			14/14	3.5/3.5	36/36

Compulsory credits = (156) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GKD350	SOIL_CLASSIF.&_SURVEYING_350 Prerequisite/s: [GKD250 GS]	S1	2	1	14
GKD351	SOIL_PHYSICS_351 Prerequisite/s: [GKD250]	S1	1	0.5	10

HSC351	NURSERY_MANAGEMENT_351	S1	2	0.5	14
PGW350	SOIL_WATER_RELA.&_IRRIGAT._350 Prerequisite/s: [GKD250]	S1	2	0.5	16
WDE310	PRINCIPLES_OF_VELD_MANAGE_310	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			9/9	3/3	33/33

Electives: Students interested in Pasture Science enrol for VKU210 (6) or AGR313 (14) and students interested in Agronomy/Horticulture enrol for AGR313 (14).

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
AGR361	INDUSTRIAL_CROPS_361 Prerequisite/s: [HSC260] and [PPK251]	S2	2	0.5	14
PLG363	PLANT_DISEASE_CONTROL_363	S2	2	1	18
ZEN365	INSECT_PEST_MANAGEMENT_365	K4	4	2	18
Totals for compulsory modules in the third/fourth terms			4/8	1.5/3.5	16/34

Electives: Students interested in Pasture Science enrol for VKU220 (12) and WDE320 (14). Students interested in Agronomy enrol for HSC320 (26) or WDE320 (14) and any other module to the value of not less than 12 credits which fits into the timetable, after permission was granted by the Head of Department; and students interested in Horticulture enrol for HSC320 (26).

Compulsory credits = (116) Elective credits = (38)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT356	PLANT_ECOPHYSIOLOGY_356 Prerequisite/s: [BOT161] or [TDH]	S1	2	1	18
HSC490	ORNAMENT_HORTICULTURE_490	S1	2	0.5	14
LKM450	ENVIRONMENTAL_BIOPHYSICS_450 Prerequisite/s: [WTW134]	S1	2	0.5	16
OKW413	WEED_SCIENCE_413 Prerequisite/s: [PPK251]	S1	2	0.5	14
PGW400	SEMINAR_400	J1	1	0	10
WDE450	EVALUAT.OF_RANGE_&_FORAGES_450	S1	3	0.5	14
Totals for compulsory modules in the first/second terms			12/12	3/3	43/43

Fourth year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
APS461	CROP_PHYSIOLOGY_461 Prerequisite/s: [GKD250] and [GKD260] and [HSC260] and [PGW350]	S2	2	0.5	14

GKD460	ENVIRONMENTAL_MANAGEMENT_460 Prerequisite/s: [GKD250] and [GKD350]	S2	4	1	26
PGW400	SEMINAR_400	J1	1	0	10
PGW421	EXPERIMENTAL_DESIGN_&_ANAL.421 Prerequisite/s: [BME120]	S2	2	0.5	14
Totals for compulsory modules in the third/fourth terms			9/9	2/2	32/32

Electives: Students enrol for WDE461 (14), PLG461 (10) or any other module that fits into the timetable, after permission was granted by the Head of Department.
Compulsory credits = (150) Elective credits = (9)
A minimum of (617) credits is required to obtain the degree.

Field of study	Dept	Code
BSc(Agric) Soil Science	PGW	03130290

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
CMY117	GENERAL_CHEMISTRY_117 Prerequisite/s: [Par 1.2]	S1	4	1	16
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
MLB111	MOLECULAR_AND_CELL_BIOLOGY_111	S1	4	1	16
PHY131	GENERAL_PHYSICS_131 Prerequisite/s: [Par 1.2]	S1	4	1	16
WTW134	MATHEMATICS_134 Prerequisite/s: [Par 1.2]	S1	4	1	16
Totals for compulsory modules in the first/second terms			20/20	4/4	37/37

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BME120	BIOMETRY_120 Prerequisite/s: [STK113] and [STK123] or [Par 1.2]	S2	4	1	16
BOT161	PLANT_BIOLOGY_161	S2	2	0.5	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
CMY127	GENERAL_CHEMISTRY_127 Prerequisite/s: [CMY117 GS]	S2	4	1	16
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
GTS161	INTRODUCTORY_GENETICS_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
MBY161	INTRODUCTION_TO_MICROBIOLO.161	S2	2	0.5	8

ZEN161	ANIMAL_DIVERSITY_161 Prerequisite/s: [MLB111 GS] or [TDH]	S2	2	0.5	8
Totals for compulsory modules in the third/fourth terms			20/20	4/4	37/37

Compulsory credits = (148) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BCM253	INTR.TO_PROTEINS_&_ENZYMES_253 Prerequisite/s: [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	2	0	9
BCM254	PRAC:INTR.TO_PROT.&ENZYMES_254 Prerequisite/s: [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]	S1	0	0.5	3
CMY282	PHYSICAL_CHEMISTRY_282 Prerequisite/s: [CMY117] and [CMY127]	S1	2	0.5	12
GKD250	INTRODUCTORY_SOIL_SCIENCE_250 Prerequisite/s: [CMY117 GS] or [TDH]	S1	3	1	12
LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251	K1	3	0	6
LEK252	INTR.TO_AGRIC._PROD._ECON._252 Prerequisite/s: [LEK251]	K2	3	0	6
PLG251	INTRODUCT._CROP_PROTECTION_251	S1	2	1	12
PPK251	SUSTAINABLE_PRODUCTION_SYS.251 Prerequisite/s: [BOT161]	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			14/14	3.5/3.5	36/36

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BOT261	PLANT_BIOCHEM._EVOLUTION_261 Prerequisite/s: [BOT161] and [CMY117] and [CMY127] or [TDH]	S2	2	1	12
CMY283	ANALYTICAL_CHEMISTRY_283 Prerequisite/s: [CMY117] and [CMY127]	S2	2	0.5	12
GKD260	SOIL_FERTIL.&_PLANT_NUTRIT.260 Prerequisite/s: [GKD250 GS]	S2	3	1	12
HSC260	CROP_PROPAGATION_260 Prerequisite/s: [BOT161]	S2	2	0.5	12
LBU260	AGROCLIMATOLOGY_260	S2	2	0.5	12
Totals for compulsory modules in the third/fourth terms			11/11	3.5/3.5	30/30

Compulsory credits = (132) Elective credits = (24)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
GKD350	SOIL_CLASSIF.&_SURVEYING_350 Prerequisite/s: [GKD250 GS]	S1	2	1	14
GKD351	SOIL_PHYSICS_351 Prerequisite/s: [GKD250]	S1	1	0.5	10
GLY151	INTRODUCTORY_GEOLOGY_151 Prerequisite/s: [Par 1.2]	K1	4	1	8
GLY152	PHYSICAL_GEOLOGY_152 Prerequisite/s: [Par 1.2]	K2	4	1	8
PGW350	SOIL_WATER_RELA.&_IRRIGAT._350 Prerequisite/s: [GKD250]	S1	2	0.5	16
WDE310	PRINCIPLES_OF_VELD_MANAGE_310	S1	2	0.5	12
Totals for compulsory modules in the first/second terms			11/11	3.5/3.5	34/34

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
AGR361	INDUSTRIAL_CROPS_361 Prerequisite/s: [HSC260] and [PPK251]	S2	2	0.5	14
GKD320	SOIL_CHEMISTRY_320 Prerequisite/s: [GKD250]	S2	2	1	14
GLY161	HISTORICAL_GEOLOGY_161 Prerequisite/s: [Par 1.2]	K4	4	1	8
GLY162	ENVIRONMENTAL_GEOLOGY_162 Prerequisite/s: [Par 1.2]	K3	4	1	8
HSC320	FRUIT_PRODUCTION_320 Prerequisite/s: [HSC260] and [PPK251]	S2	4	1	26
Totals for compulsory modules in the third/fourth terms			12/12	3.5/3.5	35/35

Compulsory credits = (138) Elective credits = (0)

Fourth year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BME210	BIOMETRY_210 Prerequisite/s: [BME120]	S1	4	1	24
LKM450	ENVIRONMENTAL_BIOPHYSICS_450 Prerequisite/s: [WTW134]	S1	2	0.5	16
OKW413	WEED_SCIENCE_413 Prerequisite/s: [PPK251]	S1	2	0.5	14
PGW400	SEMINAR_400	J1	1	0	10
Totals for compulsory modules in the first/second terms			9/9	2/2	32/32

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
APS461	CROP_PHYSIOLOGY_461 Prerequisite/s: [GKD250] and [GKD260] and [HSC260] and [PGW350]	S2	2	0.5	14

GKD460	ENVIRONMENTAL_MANAGEMENT_460 Prerequisite/s: [GKD250] and [GKD350]	S2	4	1	26
GKD461	SOIL_MINEROL.&SOIL_GENESIS_461	S2	2	1	14
PGW400	SEMINAR_400	J1	1	0	10
PGW421	EXPERIMENTAL_DESIGN_&_ANAL.421 Prerequisite/s: [BME120]	S2	2	0.5	14
Totals for compulsory modules in the third/fourth terms			11/11	3/3	39/39

Compulsory credits = (142) Elective credits = (28)
A minimum of (612) credits is required to obtain the degree.

Field of study	Dept	Code
BCons.Sc.: Clothing: Retail Management	VBR	02130124

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EKN110	ECONOMICS_110	S1	3	0	10
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FRK111	FINANCIAL_ACCOUNTING_111 Prerequisite/s: [Par.1.2]	S1	4	0	10
KLR110	CLOTHING_PROD:SEWING_TECH_110	S1	1	1	9
OBG111	DESIGN_PRINCIPLES_111	S1	1	1	7
STK110	STATISTICS_110 Prerequisite/s: [Par 1.2]	S1	3	1	13
Totals for compulsory modules in the first/second terms			16/16	3/3	29.5/29.5

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EKN120	ECONOMICS_120 Prerequisite/s: [EKN110 GS or EKN113 GS] and [Par 1.2]	S2	3	0	10
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
EST121	AESTHETICS_121 Prerequisite/s: [OBG111]	S2	1	1	9
FRK121	FINANCIAL_ACCOUNTING_121 Prerequisite/s: [FRK111 GS]	S2	4	0	12
INF181	INFORMATICS_181	S1	2	0	3
KLR120	CLOTHING_PRODUCT:PROCESSES_120 Prerequisite/s: [KLR110]	S2	1	1	9
Totals for compulsory modules in the third/fourth terms			15/15	2/2	26.5/26.5
Compulsory credits = (112) Elective credits = (0)					

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BEM110	MARKETING_MANAGEMENT_110	S1	3	0	10
EST212	AESTHETICS:PRODUC.CONS.&EN.212 Prerequisite/s: [EST121]	S1	1	1	10
KLD210	COSTUME_&_FASHION_HISTORY_210	S1	3	0	12
KLR211	FLAT_PATTERN_DESIGN_211 Prerequisite/s: [KLR120]	S1	0	2	12
OBS114	BUSINESS_MANAGEMENT_114	S1	3	0	10
TKS212	TXS:UTILITY,FIBRES_&_YARNS_212	S1	3	1	14
Totals for compulsory modules in the first/second terms			13/13	4/4	34/34

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BEM121	CONS.BEHAVIOUR&SERV.MARKET.121	S2	3	0	10
KLD222	FASHION_FORECASTING_222	S2	3	0	12
KLR221	PATTERN_USE_AND_GOOD_FIT_221 Prerequisite/s: [KLR211]	S2	1	1	10
KTP220	EXPERIENTIAL_TRAINING_220	S2	0	1	4
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10
TKS222	TXT:STRUCTURES_&_FINISHES_222 Prerequisite/s: [TKS212 GS]	S2	3	1	14
Totals for compulsory modules in the third/fourth terms			13/13	3/3	30/30

Compulsory credits = (128) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BEM211	MARKETING_MANAGEMENT_211 Prerequisite/s: [BEM110 GS]	S1	3	0	16
BER210	BUSINESS_LAW_210	S1	3	0	16
KLR311	TAILORING_311 Prerequisite/s: [KLR211] and [KLR221]	S1	1	1	11
OBS210	BUSINESS_MANAGEMENT_210	S1	3	0	16
TKS310	NEW_DEV.&_TEXTILES_IN_USE_310 Prerequisite/s: [TKS212] and [TKS222 GS]	S1	2	0	10
Totals for compulsory modules in the first/second terms			12/12	1/1	34.5/34.5

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BEM221	MARKETING_MANAGEMENT_221 Prerequisite/s: [BEM110 GS]	S2	3	0	16
BER220	BUSINESS_LAW_220	S2	3	0	16
KLD322	SOC.&CULT.ASPECTS_OF_CLOTH.322	S2	4	0	20
KLR321	CLOTHING_PRODUCTION_321 Prerequisite/s: [KLR221]	S2	1	1	11
OBS220	BUSINESS_MANAGEMENT_220	S2	3	0	16
SEM381	SEMINAR_381 Prerequisite/s: [Third year status]	S2	1	0	5
Totals for compulsory modules in the third/fourth terms			15/15	1/1	42/42

Fourth year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
BEM311	MARKETING_MANAGEMENT_311 Prerequisite/s: [BEM110] and [BEM121]	S1	3	0	20
KLD410	CLOTHING_RETAIL_MANAGEMENT_410 Prerequisite/s: [Fourth-year status]	S1	3	0	15
KLR411	PRODUCT_DEVELOPMENT_411 Prerequisite/s: [KLR221] and [KLR321]	S1	2	1	19
KTP402	CLOTHING_TEXTILE_PROJECT_402 Prerequisite/s: [SEM381] and [Fourth-year status]	J1	0	1	9
Totals for compulsory modules in the first/second terms			8/8	2/2	31.5/31.5

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BEM321	MARKETING_MANAGEMENT_321 Prerequisite/s: [BEM211 GS] and [BEM221 GS]	S2	3	0	20
KLD420	CLOTHING_MERCHANDISING_420 Prerequisite/s: [Fourth-year status]	S2	3	0	15
KTP402	CLOTHING_TEXTILE_PROJECT_402 Prerequisite/s: [SEM381] and [Fourth-year status]	J1	0	1	9
TKS421	TEXTILES_421 Prerequisite/s: [TKS212] and [TKS222] and [TKS310]	S2	3	0	15
Totals for compulsory modules in the third/fourth terms			9/9	1/1	29.5/29.5

KTP400: During the 4 years of study, during holidays, weekends and after hours, students must complete a total of 480 hours experiential training in the industry to develop practical and occupational skills. This is equal to 3 weeks x 40 hours (120 hours) per year, according to requirements as determine by the head of department. These "credits" must be successfully completed together with a complete portfolio before the degree will be conferred.

Compulsory credits = (122) Elective credits = (0)
A minimum of (515) credits is required to obtain the degree.

Field of study	Dept	Code
BCons.Sc.: Foods: Retail Management	VBR	02130114

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM110	MARKETING_MANAGEMENT_110	S1	3	0	10
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EKN110	ECONOMICS_110	S1	3	0	10
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FRK111	FINANCIAL_ACCOUNTING_111 Prerequisite/s: [Par.1.2]	S1	4	0	10
OBS114	BUSINESS_MANAGEMENT_114	S1	3	0	10
STK110	STATISTICS_110 Prerequisite/s: [Par 1.2]	S1	3	1	13
VDS111	FOOD_SUPPLY_&QUALITY_CONTR.111	S1	2	1	10
Totals for compulsory modules in the first/second terms			22/22	2/2	36.5/36.5

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM121	CONS.BEHAVIOUR&SERV.MARKET.121	S2	3	0	10
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EKN120	ECONOMICS_120 Prerequisite/s: [EKN110 GS or EKN113 GS] and [Par 1.2]	S2	3	0	10
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
FRK121	FINANCIAL_ACCOUNTING_121 Prerequisite/s: [FRK111 GS]	S2	4	0	12
INF181	INFORMATICS_181	S1	2	0	3
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10
Totals for compulsory modules in the third/fourth terms			19/19	0/0	27.5/27.5

Compulsory credits = (128) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM211	MARKETING_MANAGEMENT_211 Prerequisite/s: [BEM110 GS]	S1	3	0	16
OBG111	DESIGN_PRINCIPLES_111	S1	1	1	7

OBS210	BUSINESS_MANAGEMENT_210	S1	3	0	16
VDS210	FOODS_210 Prerequisite/s: [VDS111]	S1	3	1	18
Totals for compulsory modules in the first/second terms			10/10	2/2	28.5/28.5

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM221	MARKETING_MANAGEMENT_221 Prerequisite/s: [BEM110 GS]	S2	3	0	16
BLG260	GENERAL_MICROBIOLOGY_260	S2	2	1	8
KEP220	CULTURAL_EATING_PATTERNS_220	S2	3	0	12
VDG220	NUTRITION_220	S2	3	0	12
VDS221	FOODS_221 Prerequisite/s: [VDS210]	S2	3	1	18
Totals for compulsory modules in the third/fourth terms			14/14	2/2	33/33

Compulsory credits = (123) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM311	MARKETING_MANAGEMENT_311 Prerequisite/s: [BEM110] and [BEM121]	S1	3	0	20
VDG311	NUTRITION_311 Prerequisite/s: [FSG110] and [FSG120] or [VDG220]	S1	3	1	17
VDS310	FOODS_310 Prerequisite/s: [VDS210] and [VDS221]	S1	3	1	21
VDS354	FOODS_354	K2	3	0	8
Totals for compulsory modules in the first/second terms			9/12	2/2	29/37

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
ABV320	LABOUR_RELATIONS_320	S2	3	0	20
BEM321	MARKETING_MANAGEMENT_321 Prerequisite/s: [BEM211 GS] and [BEM221 GS]	S2	3	0	20
VDG321	NUTRIT._DURING_LIFE_CYCLE_321 Prerequisite/s: [VDG311]	S2	3	1	17
Totals for compulsory modules in the third/fourth terms			9/9	1/1	28.5/28.5

Compulsory credits = (123) Elective credits = (0)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
FST412	SENSORY_ANALYSIS_412 Prerequisite/s: [FST260] and [FST351] and [FST352] or [TDH]	S1	1	1	10

PGB410	PROJECT:_RESEARCH_METHODOL.410 Prerequisite/s: [Final-year status]	S1	2	0	10
VDB410	FOOD_SERVICE_MANAGEMENT_410 Prerequisite/s: [ABV320] and [VDB321 GS]	S1	3	1	24
VDS413	FOODS_413 Prerequisite/s: [VDS310 or VDS322]	S1	3	2	30
VDS423	FOODS_423	S1	3	0	15
Totals for compulsory modules in the first/second terms			12/12	4/4	44.5/44.5

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
VDS415	VISUAL_MERCHANDIS.OF_FOODS_415	S2	3	0	15
VDS425	PROJECT_FOODS:VISUAL_MERCH.425 Prerequisite/s: [VDS415] and [VDS423]	S2	3	0	15
VDS426	FOOD_RESEARCH_PROJECT_426 Prerequisite/s: [PGB410 #] and [VDS310]	S2	1	2	18
Totals for compulsory modules in the third/fourth terms			7/7	2/2	24/24

OPI480 (Experiential training in the industry): During the 4 years of study, during holidays, weekends and after hours, students must complete a total of 480 hours experiential training in the industry to develop practical and occupational skills. This is equal to 3 weeks x 40 hours (120 hours) per year, according to requirements as determined by the head of department. These "credits" must be successfully completed together with a complete portfolio before the degree will be conferred.

Compulsory credits = (137) Elective credits = (0)

A minimum of (511) credits is required to obtain the degree.

Field of study	Dept	Code
BCons.Sc.: Hospitality Management	VBR	02130115

First year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EKN110	ECONOMICS_110	S1	3	0	10
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
OBS114	BUSINESS_MANAGEMENT_114	S1	3	0	10
STK110	STATISTICS_110 Prerequisite/s: [Par 1.2]	S1	3	1	13
TBE110	TOURISM_MANAGEMENT_110	S1	4	0	10
VDS111	FOOD_SUPPLY_&QUALITY_CONTR.111	S1	2	1	10
Totals for compulsory modules in the first/second terms			19/19	2/2	31.5/31.5

First year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
BLG260	GENERAL_MICROBIOLOGY_260	S2	2	1	8
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EKN120	ECONOMICS_120 Prerequisite/s: [EKN110 GS or EKN113 GS] and [Par 1.2]	S2	3	0	10
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
ITW121	INTERIOR_MERCHANDISE_121	S2	2	1	8
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10
TBE120	TOURISM_MANAGEMENT_120	S2	4	0	10
Totals for compulsory modules in the third/fourth terms			18/18	2/2	28/28

Compulsory credits = (119) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
OBG111	DESIGN_PRINCIPLES_111	S1	1	1	7
OBS210	BUSINESS_MANAGEMENT_210	S1	3	0	16
VDS210	FOODS_210 Prerequisite/s: [VDS111]	S1	3	1	18
Totals for compulsory modules in the first/second terms			7/7	2/2	20.5/20.5

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
ABV320	LABOUR_RELATIONS_320	S2	3	0	20
ITW261	INTERIOR_MERCHANDISE_261	K3	2	1	5
KEP220	CULTURAL_EATING_PATTERNS_220	S2	3	0	12
TBE220	TOURISM_MANAGEMENT_220	S2	4	0	16
VDG220	NUTRITION_220	S2	3	0	12
VDS221	FOODS_221 Prerequisite/s: [VDS210]	S2	3	1	18
Totals for compulsory modules in the third/fourth terms			18/16	2/1	44/39

Compulsory credits = (124) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
ITW311	INTERIOR_MERCHANDISE_311 Prerequisite/s: [ITW121]	S1	2	1	11
TBE310	TOURISM_MANAGEMENT_310	S1	4	0	20

VDG311	NUTRITION_311 Prerequisite/s: [FSG110] and [FSG120] or [VDG220]	S1	3	1	17
VDS354	FOODS_354	K2	3	0	8
VDS355	FOOD_&_BEVERAGE_MANAGEMENT_355 Prerequisite/s: [VDS220] and [VDS221]	K1	2	1	6
Totals for compulsory modules in the first/second terms			11/12	3/2	29.5/31.5

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
VDB321	FOOD_SERVICE_MANAGEMENT_321 Prerequisite/s: [VDS322 #]	S2	3	0.5	18
VDG321	NUTRIT._DURING_LIFE_CYCLE_321 Prerequisite/s: [VDG311]	S2	3	1	17
VDS322	LARGE_SCALE_PLANNING&_PREP.322 Prerequisite/s: [KEP261 or KEP220] and [VDS221]	S2	3	3	29
Totals for compulsory modules in the third/fourth terms			9/9	4.5/4.5	32/32

Compulsory credits = (126) Elective credits = (0)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
PGB410	PROJECT:_RESEARCH_METHODOL.410 Prerequisite/s: [Final-year status]	S1	2	0	10
VDB410	FOOD_SERVICE_MANAGEMENT_410 Prerequisite/s: [ABV320] and [VDB321 GS]	S1	3	1	24
VDS413	FOODS_413 Prerequisite/s: [VDS310 or VDS322]	S1	3	2	30
VDS414	CULINARY_ART_414 Prerequisite/s: [VDS210] and [VDS221]	S1	2	1	19
Totals for compulsory modules in the first/second terms			10/10	4/4	41.5/41.5

Fourth year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
INB320	INTERIOR_PLANNING_320 Prerequisite/s: [ITW311] and [OBG111]	S2	1	1	11
OBS321	ENTREPRENEURSHIP_321	S2	3	0	20
PGB420	PROJECT:_HOSPITALITY_MANAG.420 Prerequisite/s: [PGB410 and Final-year status]	S2	4	0	20
VDS424	CULINARY_ART_424 Prerequisite/s: [VDS221] and [VDS322 #] and [VDS414]	S2	2	1	19
Totals for compulsory modules in the third/fourth terms			10/10	2/2	35/35

OPI480 (Experiential training in the industry): During the 4 years of study, during holidays, weekends and after hours, students must complete a total of 480 hours experiential training in the industry to develop practical and occupational skills. This is equal to 3 weeks x 40 hours (120 hours) per year, according to requirements as determined by the head of department. These "credits" must be successfully completed together with a complete portfolio before the degree will be conferred. Please note: Various practical and industry-interaction activities support the theoretical component of TBE110, 120, 220, 310 and VDS355 and take place after hours to develop practical and industry skills, namely TBE291 and TBE293.

Compulsory credits = (153) Elective credits = (0)

A minimum of (522) credits is required to obtain the degree.

Field of study	Dept	Code
BCons.Sc.: Interior Merchandise: Retail Management	VBR	02130125

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EKN110	ECONOMICS_110	S1	3	0	10
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
FRK111	FINANCIAL_ACCOUNTING_111 Prerequisite/s: [Par.1.2]	S1	4	0	10
INK110	INTERIOR_PRODUCTION_110	S1	1	1	9
KGK110	HISTORY_OF_ART_110	S1	3	0	12
OBG111	DESIGN_PRINCIPLES_111	S1	1	1	7
STK110	STATISTICS_110 Prerequisite/s: [Par 1.2]	S1	3	1	13
Totals for compulsory modules in the first/second terms			19/19	3/3	35.5/35.5

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EKN120	ECONOMICS_120 Prerequisite/s: [EKN110 GS or EKN113 GS] and [Par 1.2]	S2	3	0	10
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
FRK121	FINANCIAL_ACCOUNTING_121 Prerequisite/s: [FRK111 GS]	S2	4	0	12
INF181	INFORMATICS_181	S1	2	0	3
ITW121	INTERIOR_MERCHANDISE_121	S2	2	1	8

KGK120	HISTORY_OF_ART_120	S2	3	0	12
KOB183	COMMUNICATION_MANAGEMENT_183	K3	3	0	5
Totals for compulsory modules in the third/fourth terms			21/18	1/1	32.5/27.5

Compulsory credits = (131) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM110	MARKETING_MANAGEMENT_110	S1	3	0	10
ERG282	ERGONOMICS_282	S1	1	1	8
INK210	INTERIOR_PRODUCTION_210 Prerequisite/s: [INK110]	S1	1	1	10
MTT210	FURNITURE&_TEXTILE_HISTORY_210	S1	3	0	12
OBS114	BUSINESS_MANAGEMENT_114	S1	3	0	10
TKS212	TXS:UTILITY,FIBRES_&_YARNS_212	S1	3	1	14
Totals for compulsory modules in the first/second terms			14/14	3/3	32/32

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BDO181	INDUSTR._&_ORG._PSYCHOLOGY_181	K2	4	0	5
BEM121	CONS.BEHAVIOUR&SERV.MARKET.121	S2	3	0	10
INB220	INTERIOR_PLANNING_220 Prerequisite/s: [ERG282 GS] and [OBG111]	S2	1	2	16
ITW221	INTERIOR_MERCHANDISE_221 Prerequisite/s: [ITW121]	S2	2	1	10
MTT220	FURNITURE&_TEXTILE_HISTORY_220 Prerequisite/s: [MTT210 GS]	S2	3	0	12
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10
TKS222	TXT:STRUCTURES_&_FINISHES_222 Prerequisite/s: [TKS212 GS]	S2	3	1	14
Totals for compulsory modules in the third/fourth terms			15/19	4/4	36/41

Compulsory credits = (141) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BDO219	INDUSTR.AND_ORG.PSYCHOLOGY_219	S1	3	0	16
BEM211	MARKETING_MANAGEMENT_211 Prerequisite/s: [BEM110 GS]	S1	3	0	16
BER210	BUSINESS_LAW_210	S1	3	0	16

INK310	INTERIOR_PRODUCTION_310 Prerequisite/s: [INK210]	S1	1	1	11
ITW311	INTERIOR_MERCHANDISE_311 Prerequisite/s: [ITW121]	S1	2	1	11
OBS213	ENTREPRENEURSHIP_213	S1	3	0	16
Totals for compulsory modules in the first/second terms			15/15	2/2	42.5/42.5

Third year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM221	MARKETING_MANAGEMENT_221 Prerequisite/s: [BEM110 GS]	S2	3	0	16
BER220	BUSINESS_LAW_220	S2	3	0	16
CIL122	VISUAL_DESIGN_(AUTOCAD)_122	S2	2	0	4
INB322	INTERIOR_PLANNING_322 Prerequisite/s: [ERG282] and [ITW311] and [OBG111]	S2	1	1	11
SEM381	SEMINAR_381 Prerequisite/s: [Third year status]	S2	1	0	5
Totals for compulsory modules in the third/fourth terms			10/10	1/1	26/26

Compulsory credits = (138) Elective credits = (0)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM311	MARKETING_MANAGEMENT_311 Prerequisite/s: [BEM110] and [BEM121]	S1	3	0	20
INB410	INTERIOR_PLANNING_410 Prerequisite/s: [CIL122] and [INB322]	S1	1	2	23
ITP481	PROJECT:_INTERIOR_MERCHAN._481 Prerequisite/s: [INB322] and [INB410 #] and [SEM381 GS] and [Final-year status]	J1	1	1	11
VBF411	CONSUMER_FACILITATION_411	S1	2	0	10
Totals for compulsory modules in the first/second terms			7/7	3/3	32/32

Fourth year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
BEM321	MARKETING_MANAGEMENT_321 Prerequisite/s: [BEM211 GS] and [BEM221 GS]	S2	3	0	20
ITP481	PROJECT:_INTERIOR_MERCHAN._481 Prerequisite/s: [INB322] and [INB410 #] and [SEM381 GS] and [Final-year status]	J1	1	1	11
Totals for compulsory modules in the third/fourth terms			4/4	1/1	15.5/15.5

IPO 380 (Experiential training): During the third year of study, during holidays, weekends and after hours, students must complete a total of 120 hours experiential training in the industry to develop practical and occupational skills. This is equal to 3 weeks x 40 hours (120 hours), according to requirements as determined by the head of department. This experiental training must be successfully completed together with a final report before the degree will be conferred.

Compulsory credits = (95) Elective credits = (0)

A minimum of (505) credits is required to obtain the degree.

Field of study	Dept	Code
BCons.Sc: Ed(Consumer Studies)	VBR	02130122

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
KLR110	CLOTHING_PROD:SEWING_TECH_110	S1	1	1	9
OBG111	DESIGN_PRINCIPLES_111	S1	1	1	7
OBS114	BUSINESS_MANAGEMENT_114	S1	3	0	10
SCE171	RELIGIOUS_INSTRUCTION_171	S1	2	0	8
VDS111	FOOD_SUPPLY_&QUALITY_CONTR.111	S1	2	1	10
Totals for compulsory modules in the first/second terms			13/13	3/3	27/27

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
EOT164	COMMUNIC._IN_ORGANISATIONS_164	K4	3	0	6
ITW121	INTERIOR_MERCHANDISE_121	S2	2	1	8
KEP220	CULTURAL_EATING_PATTERNS_220	S2	3	0	12
KLR120	CLOTHING_PRODUCT:PROCESSES_120 Prerequisite/s: [KLR110]	S2	1	1	9
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10
Totals for compulsory modules in the third/fourth terms			13/16	2/2	24.5/30.5

Compulsory credits = (109) Elective credits = (0)

Second year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
ERG282	ERGONOMICS_282	S1	1	1	8
INK210	INTERIOR_PRODUCTION_210 Prerequisite/s: [INK110]	S1	1	1	10
SCE201	SCIENCE_EDUCATION_201	J1	2	0	8
SOC210	SOCIOLOGY_210	S1	3	0	20
TKS212	TXS:UTILITY,FIBRES_&_YARNS_212	S1	3	1	14
VDS210	FOODS_210 Prerequisite/s: [VDS111]	S1	3	1	18
Totals for compulsory modules in the first/second terms			13/13	4/4	39/39

Second year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
ITW221	INTERIOR_MERCHANDISE_221 Prerequisite/s: [ITW121]	S2	2	1	10
SCE201	SCIENCE_EDUCATION_201	J1	2	0	8
TKS222	TXT:STRUCTURES_&_FINISHES_222 Prerequisite/s: [TKS212 GS]	S2	3	1	14
VDG220	NUTRITION_220	S2	3	0	12
VDS221	FOODS_221 Prerequisite/s: [VDS210]	S2	3	1	18
Totals for compulsory modules in the third/fourth terms			13/13	3/3	31/31

Compulsory credits = (140) Elective credits = (0)

Third year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
ITW311	INTERIOR_MERCHANDISE_311 Prerequisite/s: [ITW121]	S1	2	1	11
SCE303	SCIENCE_EDUCATION_303 Prerequisite/s: [CIL111 GS]	J1	2	1	18
VDG311	NUTRITION_311 Prerequisite/s: [FSG110] and [FSG120] or [VDG220]	S1	3	1	17
VDS354	FOODS_354	K2	3	0	8
VDS355	FOOD_&_BEVERAGE_MANAGEMENT_355 Prerequisite/s: [VDS220] and [VDS221]	K1	2	1	6
Totals for compulsory modules in the first/second terms			9/10	4/3	28.5/30.5

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
INB320	INTERIOR_PLANNING_320 Prerequisite/s: [ITW311] and [OBG111]	S2	1	1	11

KLD322	SOC.&CULT.ASPECTS_OF_CLOTH.322	S2	4	0	20
SCE303	SCIENCE_EDUCATION_303 Prerequisite/s: [CIL111 GS]	J1	2	1	18
VDG321	NUTRIT._DURING_LIFE_CYCLE_321 Prerequisite/s: [VDG311]	S2	3	1	17
VDS322	LARGE_SCALE_PLANNING&_PREP.322 Prerequisite/s: [KEP261 or KEP220] and [VDS221]	S2	3	3	29
Totals for compulsory modules in the third/fourth terms			13/13	6/6	47.5/47.5

Compulsory credits = (155) Elective credits = (0)

Fourth year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
ASS400	ASSESSMENT_400	J1	Block session		6
COE400	SOCIAL_CONTEXTS_IN_EDUCAT._400	J1	Block session		6
FCL400	FACILITATING_LEARNING_400	J1	Block session		12
FOE400	FOUNDATIONS_OF_EDUCATION_400	J1	Block session		3
GPE400	GLOBAL_PERSPECTIVES_IN_EDU.400	J1	Block session		3
LNT400	LEARNING_THEORIES_400	J1	Block session		6
PEL400	PROFESSIONAL_ETHICS_&_LAW_400	J1	Block session		3
PPF400	PROFESSIONAL_PORTFOLIO_400	J1	Block session		6
VHT400	SUBJ.DID:_COMSUMER_STUDIES_400	J1	Block session		12
Totals for compulsory modules in the first/second terms					28.5/28.5

Fourth year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
ASS400	ASSESSMENT_400	J1	Block session		6
COE400	SOCIAL_CONTEXTS_IN_EDUCAT._400	J1	Block session		6
FCL400	FACILITATING_LEARNING_400	J1	Block session		12
FOE400	FOUNDATIONS_OF_EDUCATION_400	J1	Block session		3

GPE400	GLOBAL_PERSPECTIVES_IN_EDU.400	J1	Block session	3
LNT400	LEARNING_THEORIES_400	J1	Block session	6
PEL400	PROFESSIONAL_ETHICS_&_LAW_400	J1	Block session	3
PPF400	PROFESSIONAL_PORTFOLIO_400	J1	Block session	6
VHT400	SUBJ.DID:_COMSUMER_STUDIES_400	J1	Block session	12
Totals for compulsory modules in the third/fourth terms				28.5/28.5

Compulsory credits = (114) Elective credits = (0)
A minimum of (518) credits is required to obtain the degree.

Field of study	Dept	Code
BCons.Sc: Ed(Hospitality Studies)	VBR	02130123

First year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL111	COMPUTER_LITERACY_111	S1	2	0	4
EKN110	ECONOMICS_110	S1	3	0	10
EOT110	ACADEMIC_LITERACY(1)_110	S1	2	0	6
OBG111	DESIGN_PRINCIPLES_111	S1	1	1	7
OBS114	BUSINESS_MANAGEMENT_114	S1	3	0	10
SCE171	RELIGIOUS_INSTRUCTION_171	S1	2	0	8
TBE110	TOURISM_MANAGEMENT_110	S1	4	0	10
VDS111	FOOD_SUPPLY_&QUALITY_CONTR.111	S1	2	1	10
Totals for compulsory modules in the first/second terms			19/19	2/2	32.5/32.5

First year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
CIL121	INFORMATION_LITERACY_121	S2	2	0	4
EKN120	ECONOMICS_120 Prerequisite/s: [EKN110 GS or EKN113 GS] and [Par 1.2]	S2	3	0	10
EOT120	ACADEMIC_LITERACY(2)_120	S2	2	0	6
EOT164	COMMUNIC._IN_ORGANISATIONS_164	K4	3	0	6
ITW121	INTERIOR_MERCHANDISE_121	S2	2	1	8
OBS124	BUSINESS_MANAGEMENT_124	S2	3	0	10

TBE120	TOURISM_MANAGEMENT_120	S2	4	0	10
Totals for compulsory modules in the third/fourth terms			16/19	1/1	24/30

Compulsory credits = (119) Elective credits = (0)

Second year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
SCE201	SCIENCE_EDUCATION_201	J1	2	0	8
TBE310	TOURISM_MANAGEMENT_310	S1	4	0	20
TKS211	TEXTILES:_UTILITY_211	K1	3	1	7
VDS210	FOODS_210 Prerequisite/s: [VDS111]	S1	3	1	18
Totals for compulsory modules in the first/second terms			12/9	2/1	30/23

Second year, second semester:

Code	Name	Trm	lpw	ppw	Crdt
ITW221	INTERIOR_MERCHANDISE_221 Prerequisite/s: [ITW121]	S2	2	1	10
KEP220	CULTURAL_EATING_PATTERNS_220	S2	3	0	12
SCE201	SCIENCE_EDUCATION_201	J1	2	0	8
TBE220	TOURISM_MANAGEMENT_220	S2	4	0	16
VDG220	NUTRITION_220	S2	3	0	12
VDS221	FOODS_221 Prerequisite/s: [VDS210]	S2	3	1	18
Totals for compulsory modules in the third/fourth terms			17/17	2/2	38/38

Compulsory credits = (129) Elective credits = (0)

Third year, first semester:

Code	Name	Trm	lpw	ppw	Crdt
SCE303	SCIENCE_EDUCATION_303 Prerequisite/s: [CIL111 GS]	J1	2	1	18
VDG311	NUTRITION_311 Prerequisite/s: [FSG110] and [FSG120] or [VDG220]	S1	3	1	17
VDS354	FOODS_354	K2	3	0	8
VDS355	FOOD_&_BEVERAGE_MANAGEMENT_355 Prerequisite/s: [VDS220] and [VDS221]	K1	2	1	6
VDS414	CULINARY_ART_414 Prerequisite/s: [VDS210] and [VDS221]	S1	2	1	19
Totals for compulsory modules in the first/second terms			9/10	4/3	33/35

Third year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
SCE303	SCIENCE_EDUCATION_303 Prerequisite/s: [CIL111 GS]	J1	2	1	18
VDB321	FOOD_SERVICE_MANAGEMENT_321 Prerequisite/s: [VDS322 #]	S2	3	0.5	18
VDS322	LARGE_SCALE_PLANNING&_PREP.322 Prerequisite/s: [KEP261 or KEP220] and [VDS221]	S2	3	3	29
VDS424	CULINARY_ART_424 Prerequisite/s: [VDS221] and [VDS322 #] and [VDS414]	S2	2	1	19
Totals for compulsory modules in the third/fourth terms			10/10	5.5/5.5	42/42

Compulsory credits = (152) Elective credits = (0)

Fourth year, first semester:					
Code	Name	Trm	lpw	ppw	Crdt
ASS400	ASSESSMENT_400	J1	Block session		6
COE400	SOCIAL_CONTEXTS_IN_EDUCAT._400	J1	Block session		6
FCL400	FACILITATING_LEARNING_400	J1	Block session		12
FOE400	FOUNDATIONS_OF_EDUCATION_400	J1	Block session		3
GPE400	GLOBAL_PERSPECTIVES_IN_EDU.400	J1	Block session		3
LNT400	LEARNING_THEORIES_400	J1	Block session		6
PEL400	PROFESSIONAL_ETHICS_&_LAW_400	J1	Block session		3
PPF400	PROFESSIONAL_PORTFOLIO_400	J1	Block session		6
VHS400	SUBJ.DID:_HOSPITALITY_STUD.400	J1	Block session		12
Totals for compulsory modules in the first/second terms					28.5/28.5

Fourth year, second semester:					
Code	Name	Trm	lpw	ppw	Crdt
ASS400	ASSESSMENT_400	J1	Block session		6
COE400	SOCIAL_CONTEXTS_IN_EDUCAT._400	J1	Block session		6

FCL400	FACILITATING_LEARNING_400	J1	Block session	12
FOE400	FOUNDATIONS_OF_EDUCATION_400	J1	Block session	3
GPE400	GLOBAL_PERSPECTIVES_IN_EDU.400	J1	Block session	3
LNT400	LEARNING_THEORIES_400	J1	Block session	6
PEL400	PROFESSIONAL_ETHICS_&_LAW_400	J1	Block session	3
PPF400	PROFESSIONAL_PORTFOLIO_400	J1	Block session	6
VHS400	SUBJ.DID:_HOSPITALITY_STUD.400	J1	Block session	12
Totals for compulsory modules in the third/fourth terms				28.5/28.5

Compulsory credits = (114) Elective credits = (0)
A minimum of (514) credits is required to obtain the degree.

Sc.7.1.1 REGULATIONS FOR THE BSC PROGRAMME PREVIOUSLY OFFERED AT MAMELODI CAMPUS

General Regulations G.1 to G.15 apply.

1. Academic Literacy (EOT 110 and EOT 120)
All new first-year students are required to write an academic literacy test. Based on the results of the test, a student will be enrolled in language development modules that have to be passed before the degree will be awarded. All students who pass the Academic Literacy Test have to register for modules of equal value to make up the credits from the following **(only offered at the Hatfield Campus):** FIL 110, FIL 155 or other language modules: AFT 110, AFR 110, ENG 110, ENG 120, EOT 161, EOT 162, EOT 164, NDE 110, SEP 110, STW 110, ZUL 110, SCI 154, SCI 164 or MTL 181..

2. Application of old and new regulations

i. Should a regulation, according to which a curriculum has been compiled, be amended, a student, who has started his or her curriculum under the old regulation and who has not interrupted his or her study, may complete such a curriculum in accordance with the old regulation, subject to conditions specified by the Faculty.

ii. A student, who has been registered for a degree and
   (a) who has failed to renew his or her registration in the ensuing calendar year; or
   (b) who does not obtain the required credits and therefore has not complied with the prescribed requirements for progress, is deemed to have

interrupted his or her study and forfeits the right to continue studies under the old regulation. In exceptional cases, the Dean may grant such a student permission to continue his or her study in terms of such stipulation as the Dean may determine.

iii. Subject to transitional measures laid down by the Faculty, a student must complete his or her degree in accordance with the regulations, which were applicable when he or she first registered. If a student interrupts his or her studies, the regulations in the year in which studies are resumed, will be applicable.

3. Termination of registration

The Dean may, on the recommendation of the relevant faculty committee, cancel the registration of a student or the registration for a module during an academic year, if the student fails to comply with the minimum requirements determined by the faculty board with regard to tests, examinations or any other work – with the proviso that a student may request that the Dean reconsider the decision in terms of the set procedures. (Please refer to Regulation G.9 for more detailed information.)

3. General

(a) A student who takes a module offered by another faculty must take note of the admission requirements and prerequisites for such a module, sub-minima required in examinations papers, supplementary examinations, etc.

(b) It is the responsibility of all students to familiarise themselves with the General and Faculty Regulations of the University, as well as the procedures, rules and instructions pertaining to study in this Faculty. Ignorance of the applicable regulations, rules and instructions, or the wrong interpretation thereof will not be accepted as an excuse for not complying with the stipulations of such regulations, rules and instructions.
In view of the above paragraph, it is thus the responsibility of students to ensure before registration, that their curricula comply with all the requirements of the applicable regulations.

BACCALAUREUS SCIENTIAE (New curriculum) (Code 02139906)
(Four-year programme)

This programme will be phased out from the 2008 academic year:

S1 General Information

The BSc degree is a standard Science qualification at undergraduate level. Students are required to select two subjects as major subjects (referred to as Major A and Major B in S2 and S3) from the list of major subjects below to be taken in years 2, 3 and 4. Minor subjects may be chosen as electives for Year 2 and/or 3 but are not offered in year 4.
The choice of modules is subject to approval by the Head of Department and the Dean as well as to the applicable rules of combination. One major subject may be selected from the list of major subjects below, and the second major subject may be selected for a limited number of choices from another faculty.

Possible minor subjects (electives offered in years 2 and 3)	Possible major subjects (years 2, 3 and 4)
Geography	Geography

Mathematics	Mathematics
Statistics and Mathematical Statistics	Statistics and Mathematical Statistics
Computer Science and Informatics	

[§] No first-time registrations from 2008 onwards for the Computer Science and Informatics minor subject

S2 General Structure of the degree

To complete a BSc degree, students are required to obtain 420 credits. Of these at least 120 credits must correspond to major subjects taken in the 4th study year. The curriculum is as follows:

Codes: F - fundamental, C - core module, E - elective

Module	Code	Credit		Module	Code	Credit	
FIRST STUDY YEAR Semester 1				**FIRST STUDY YEAR Semester 2**			
Introductory Mathematics	MPR 193	8	F	Introductory Mathematics	MPR 194	8	F
Semester 1				Semester 2			
Introductory Chemistry	CGS 151	8	F	Limited choice: Introductory Chemistry	CGS 161	8	F
Introductory Physics	CGS 152	8	F	Introductory Physics	CGS 162	8	F
Introductory Biology	CGS 153	8	F	Introductory Biology	CGS 163	8	F
Academic Literacy	EOT 110	6	F	Academic Literacy	EOT 120	6	F
Computer Literacy	CIL 111	4	F	Information Literacy	CIL 121	4	F

[§] No first-time registrations from 2008 onwards for the modules COS162, COS163 and INF167

Module		Credits	
FIRST STUDY YEAR		**84**	
SECOND STUDY YEAR		**96**	
Major A	see rules S1, S2 and S4	32	C
Major B	see rules S1, S2 and S4	32	C
Elective or minor	see rules S1, S2 and S4	32	E
THIRD STUDY YEAR		**120**	
Major A	see rules S1, S2 and S4	42	C
Major B	see rules S1, S2 and S4	42	C
Elective	see rules S1, S2 and S4	42	E
FOURTH STUDY YEAR		**120**	
Major A	see rules S1, S2 and S4	60	C
Major B	see rules S1, S2 and S4	60	C
TOTAL		**420**	

S3 Curriculum

Field	2nd study year	Crdts	3rd study year	Crdts	4th study year	Crdts
Geography	GGR151and GGR161	32	GGR251 and GGR261	42	GGR351 and GGR361	60
Mathematics	MAT151, 152 and MAT161, 162	32	MAT251 and MAT261, 262	42	MAT351, 352 and MAT361, 362	60
Statistics	STA151 and 161	32	STA251 and STA261	42	STA351 and STA361	60
Computer Science & Informatics	COS101 COS173 COS104 INF169, 166	16 8 16 10	COS204 INF255 INF265, 266	16 14 14		

S4 Rules of combination

4.1 Minimum Mathematics required for the BSc (4-year) degree

4.1.1 MAT 151, 152, 161 and 162 must be taken in the second year of study for all BSc programmes.
If Statistics is selected as a major subject for the BSc (4-year programme) together with a second major chosen from one of the subjects described in 4.2.1, 4.2.2, 4.2.3 then MAT 251, 261 and 262 are highly recommended in the third year of study.

4.2 Major B can also be selected from the following subjects in line with the limitations specified next to each subject:

4.2.1 Economics (EKN): With the approval of the Head of Department and the Dean and subject to compliance with prerequisites.

4.2.2 Psychology (SLK): With the approval of the Head of Department and the Dean and subject to compliance with prerequisites.

4.2.3 Major B cannot be selected from another faculty if Major A is Geography.

4.3 Credit requirements at 4th year

4.3.1 If Major B is chosen from another faculty according to rule 4.2 students must ensure that sufficient credits are earned by taking additional elective modules to ensure that credits at the 300 level (4th year level) total to at least 120.
Students must ensure that the necessary prerequisite modules have been taken and passed at the preceding levels to allow the requisite additional elective to be taken.

4.4 Electives

4.4.1 Minor subjects as listed in the table in S3.

S5 Promotion requirements

5.1 Re-registration is permitted only under the following conditions:

5.1.1 A first-year student who passes a minimum of 50% of the prescribed credits for the first year of study other than the Language and Computer Literacy modules is permitted to re-register for the first year. A first-year student who only passes the language modules and the Computer Literacy modules and none of the other prescribed modules during the June examination will not be permitted to continue

with his or her studies in the second semester. For these purposes the June progress mark for year modules will be taken into consideration.

5.1.2 A second-year student who passes a minimum of 50% of the prescribed credits for the second year of study is permitted to re-register for the second year of study.

5.1.3 A third-year student who passes a minimum of 50% of the prescribed credits for the third year of study is permitted to re-register for the third year of study.

5.1.4 A student must complete the BSc (4-year) programme within the prescribed minimum period plus two years.

5.2 A first-year student who passes 75% of the credits prescribed for the first year of study is promoted to the second year.

5.2.1 A second-year student who passes 75% of the second year credits prescribed for the programme is promoted to the third year of study.

5.2.2 A third-year student who passes 75% of the third year credits prescribed for the programme is promoted to the fourth year of study.

5.2.3 **A fourth-year student must complete the degree within two years.**

S6 Rules of exclusion

6.1 A first-year student who only passes the language modules and the computer literacy modules and none of the other prescribed modules during the June examination will not be permitted to continue with his or her studies in the second semester. For these purposes the June progress mark for the year modules will be taken into consideration.

6.2 A student must complete the BSc (4-year) programme within the prescribed minimum period plus two years.

6.3 A student who did not pass the equivalent of two semester core modules during a semester in any year will not be permitted to continue with his or her studies in the following semester.

S7 Degree with distinction

A student obtains his or her degree with distinction if all the prescribed modules at 300-level are passed in one academic year with a weighted average of 75%, and obtains a mark of at least 65% in each of the relevant 300 level modules.

S8 Special examinations in the Faculty

A student who requires a maximum of two semester modules to comply with all the requirements of the degree, may be permitted by the Dean, on recommendation of the Head of Department, to special examinations in modules failed, provided that this will enable him or her to comply with all the degree requirements.

A student who has obtained a final mark of less than 40% in any one of the relevant modules, or who has previously been admitted to a special examination, does not qualify for this concession.

S9 TRANSITIONAL ARRANGEMENTS for Baccalaureus Scientiae (Code: 02139906)

GEOGRAPHY

Module	Register for	Module in which student has to attend classes	Examination	
			Exam paper	Write with
GGR 151	GGR 151		GGR 151	GGR 151
GGR 161	GGR 161		GGR 161	GGR 161

Module	Register for	Module in which student has to attend classes	Examination	
			Exam paper	Write with
GGR 251	GGR 251		GGR 251	GGR 251
GGR 261	GGR 261		GGR 261	GGR 261
GGR 351	GGR 351		GGR 351	GGR 351
GGR 361	GGR 361		GGR 361	GGR 361

MATHEMATICS

Module	Register for	Attend classes in	Examination	
			Exam paper	Write with
MAT 151	MAT 151	WTW 114	MAT 151	WTW 114
MAT 152	MAT 152	WTW 126	MAT 152	WTW 126
MAT 161	MAT 161	WTW 168	MAT 161	WTW 168
MAT 162	MAT 162	WTW 128	MAT 162	WTW 128
MAT 251	MAT 251		MAT 251	MAT 251
MAT 261	MAT 261		MAT 261	MAT 261
MAT 262	MAT 262		MAT 262	MAT 262
MAT 351	MAT 351		MAT 351	MAT 351
MAT 352	MAT 352		MAT 352	MAT 352
MAT 361	MAT 361		MAT 361	MAT 361
MAT 362	MAT 362		MAT 362	MAT 362

Out-standing Mamelodi module	Last registra-tions in	Last lectures presented in	Last tutor classes only in	Last special exams in	Module for which to register in 2009	Module in which lectures will be attended in 2009	Equivalent Hatfield module
STA151	2008	2008	2008	*Jan 2009	STK10	STK110	STK110
STA161	2008	2008	2008	*Jan 2009	STK20	STK120	STK120
STA251	*2009	2008	*2009	*Jan 2010	♠STA251	#STK210	STK210
STA261	*2009	2008	*2009	*Jan 2010	♠STA261	#STK220	STK220
STA351	*2010	2009	*2010	*Jan 2011	♥STA351	♥STA351	STK310
STA361	*2010	2009	*2010	*Jan 2011	♥STA361	♥STA361	STK320

* Only for students repeating the module. (Other students enroll for equivalent Hatfield Modules.)

Students who passed STA151 and STA161 in 2008 and still need to do STA251 and STA261 must change their enrolment to STK210 and STK220 in 2009.

♠ Students who are repeating STA251 and STA261 can elect to enrol for STK210 and STK220 in 2009 should they wish to attend formal lectures.

♥ Students who are repeating STA351 and STA361 can elect to enrol for STK310 and STK320 should they wish to do so.

♥ Students who passed STA251 and STA261 and still need to do STA351 and STA361 are advised to change their enrolment to STK310 and STK320.

S10 Programmes that have been or are being phased out

The following programmes previously offered at the Mamelodi Campus in the Faculty of Natural and Agricultural Sciences have been or are being phased out:

Qualification	Normal duration (in years)	Code
Science Programmes:		
Baccalaureus Scientiae (3-year degree)*	3	BSC*
Baccalaureus Scientiae (4-year degree)*	4	BSC4YR*
Baccalaureus Scientiae Honores*	1	BSCHON*
Magister Scientiae*	2	MSC*
Consumer Science and Human Ecology Programmes:		
Baccalaureus Consumer Science*	4	BCS*
Baccalaureus Human Ecology (Community Nutrition)*	4	BHECN*
Science Education Programmes:		
Baccalaureus Scientiae Educationis*	4	BSCED*

*No intake of any students

S11 Syllabi

See syllabi on p 168 for description of modules not listed here.

MAT 251, Functions of several variables & Vector calculus 251, 20 cr, 4 lpw + 2 tpw, Sem 1
Mathematics and Applied Mathematics (Last Tutors/registration: 2009)
Parametric equations, vector functions, space curves and arc lengths. Quadric surfaces, calculus of multivariable functions, partial derivatives, directional derivatives. Extrema and Lagrange multipliers. Multiple integrals, polar, cylindrical and spherical coordinates. Line integrals and the theorem of Green.
Vector calculus: Surface integrals and the theorems of Gauss and Stokes.
Prerequisite/s: MAT 152

MAT 261, Linear Algebra II 261, 11 cr, 2 lpw + 1 tpw, Sem 2
Mathematics and Applied Mathematics (Last Tutors/registration: 2009)
Vector spaces: Vector spaces and subspaces, linear independence, basis and dimension, coordinate vectors, inner product spaces.
Linear transformations: Algebra of linear transformations, kernel and image, matrix of a general linear transformation, change of basis.
Eigenvalues and eigenvectors, diagonalization.
Prerequisite/s: MAT 152

MAT 262, Infinite sequences and series 262, 11 cr, 2 lpw + 1 tpw, Sem 2
Mathematics and Applied Mathematics (Last Tutors/registration: 2009)
Series of functions, power series and Taylor series.
Prerequisite: MAT 161

MAT 351, Real Analysis 351, 15 cr, 3 lpw + 1 tpw, Sem 1
Mathematics and Applied Mathematics (Last Tutors/registration: 2010)
Topology of finite dimensional spaces: Open and closed sets, sequences, compactness, and completeness. Theorems of Bolzano-Weierstrass and Heine-Borel. Properties of continuous functions and applications. Sequences and series of functions.
Prerequisite/s: MAT 251 and MAT 262 (or MAT 291 and MAT 292)

MAT 352, Abstract Algebra 352, 15 cr, 3 lpw + 1 tpw, Sem 1
Mathematics and Applied Mathematics (Last Tutors/registration: 2010)
Groups: Definition and examples, permutation group of a set, symmetry of a figure, subgroups, cyclic groups and dihedral groups, homomorphisms and isomorphisms.
Quotient groups: Equivalence relations, cosets and Lagrange's theorem, normal subgroups and quotient groups, isomorphism theorems.Rings and fields: Rings, integral domains and fields, subrings and ring homomorphisms, polynomial rings, polynomial and Euclidean rings (division algorithm, Euclidean algorithm, unique factorization, factoring real and complex polynomials, factoring rational and integral polynomials). Geometrical constructions: Constructable numbers, constructability and extensions of Q, construct-ability and polynomials, classical problems.
Prerequisite/s: MAT 261 (or MAT 293)

MAT 361, Complex Analysis 361, 15 cr, 3 lpw + 1 tpw, Sem 2
Mathematics and Applied Mathematics (Last Tutors/registration: 2010)
Complex functions, Cauchy-Riemann equations, Cauchy's theorem and integral formulas. KMS states. Laurent series, residue theorem and application to calculating of integrals.
Prerequisite/s: MAT 251 & MAT 262 (or MAT 291 & MAT 292)

MAT 362, Numerical Analysis 362, 15 cr, 3 lpw + 1 ppw + 1 tpw, Sem 2
Mathematics and Applied Mathematics (Last Tutors/registration: 2010)
Errors and floating point arithmetic. Roots of nonlinear equations: Bisection, Newton's method and the secant method, routines for zero finding, non-linear systems of equations. Systems of linear equations: Gauss elimination with partial pivoting, matrix factorisation, matrices with special structure, numerical differentiation and integration.
Prerequisite/s: MAT 251 and MAT 261 (or MAT 291 and MAT 293)

STK 210, Statistics 210, 20 cr, 3 lpw. + 3 hours ppw (14 weeks)
Probability theory. Univariate probability distributions, expected values and moments.
Special probability distributions: binomial, hypergeometric, poison, exponential, gamma, beta and normal distribution. Probability distributions and moments in the bivariate case.
The bivariate normal distribution. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.
Prerequisite/s: STA151 and 161 or STK113, 123 and STA 161 or STK 110 and STK 120

STK 220, Statistics 220, 20 cr, 3 lpw. + 3 hours ppw (14 weeks)
Probability distributions and moments in multivariate case. Multinomial distribution.
Probability distributions of functions of random variables. Sampling procedures and distributions. Statistical interference concerning means, variances and proportions in one and two-sample cases. Identification, use, evaluation and interpretation of statistical computer packages and techniques in the simulation of distributions and statistical inference.
Prerequisite/s: STK 210 GS

STA 251, Statistics 251, 21 cr, 4 lpw + 2 ppw, Sem 1
Regression Analysis (Last Tutors/registration: 2008)
An introduction to regression analysis, straight line regression analysis, the correlation coefficient and straight line regression analysis, the ANOVA table, multiple regression analysis, testing hypothesis in multiple regression.
Time Series
Introduction to time series, time series regression, exponential smoothing, decomposition models, non-seasonal Box-Jenkins models. Use of Excel and SPSS in applying knowledge gained in Regression Analysis and Time Series.
Prerequisite/s: STA151, 161 or STK113, 123 and STA161

STA 261, Statistics 261, 21 cr, 4 lpw + 2 ppw, Sem 2
Probability Distributions (Last Tutors/registration: 2008)
Probability, rules of probability, conditional probability, Baye's theorem, random variables, probability distributions, mathematical expectation, moment generating functions, common discrete and continuous distributions.
Sampling Distributions
Joint probability distributions, marginal and conditional distributions, functions of random variables, the chi-square distribution, the t distribution, the F distribution, order statistics.
Use of Excel and SPSS in applying the knowledge gained in probability and sampling distributions.
Prerequisite/s: STA151, 161 or STK113, 123 and STA 161

STK 310, Statistics 310 25 cre, 3 lpw + 3 hours ppw (14 weeks)
Regression analysis: simple and multiple regressions, nonlinear regression, correlation and the use of the dummy variables. Multivariate distributions: normal, multinomial and poison distribution. Linear combinations of normal variables. Analysis of variance and covariance. Categorical data analysis. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques.
Prerequisite/s: STK210 and STK220

STK 320, Statistics 320, 25 cr, 3 lpw + 3 hours ppw (14 weeks)
Regression analysis extensions: heteroscedasticity, serial correlation and lag structures. Time-series analysis. Applications of matrices, differentiation and integration in the economic management sciences. Evaluation of simple economic models. Theory and applications of time-series models: univariate time series. Stationary and non-stationary time series. ARMA and ARIMA models. Regression models. Model identification and estimation. Spectrum and periodogram. Forecasting with time-series models.
Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. Student seminars.
Prerequisite/s: STK 310 GS

STA 351, Statistics 351, 30 cr, 4 lpw + 2 ppw, Sem 1
Statistical Inference (Last Tutors/registration: 2009)
Point estimation, interval estimation, losses and risks, Bayesian estimation, method of moment estimators, maximum likelihood estimators, unbiasedness, efficiency, consistency, sufficiency, robustness, UMVUE, Rao-Blackwell Theorem, hypothesis testing, the Neyman-Pearson Lemma, the most powerful test, likelihood ratio tests, non-parametric tests. Introduction to SPSS, properties of estimators by simulation techniques, sampling distributions of estimators, SPSS t-tests and non-parametric tests, interpretation of SPSS output.
Prerequisite/s: STA251, STA261

STA 361, Statistics 261, 30 cr, 4 lpw + 2 ppw, Sem 2
Survey sampling (Last Tutors/registration: 2009)
Elements of the sampling problem, simple random sampling, stratified random sampling, ratio, regression and difference estimators, cluster sampling. Design of questionnaires, data collection techniques, planning a survey, field work, SPSS data format, data analysis with SPSS, report writing, report presentation, interpretation of SPSS output.
Design and analysis of experiments
Collecting data by experiments, principles of experimental design, completely randomized designs, randomized block designs, Latin square designs, introduction to factorial experiments, industrial experimentation. Excel and SPSS applications of experimental designs.
Prerequisite/s:STA251 or STA261

Sc.7.2 BACCALAUREUS SECUNDAE EDUCATIONIS (SCIENTIAE) BSecEd(Sci) (Code 02135001)

(a) Admission requirements
A National Senior Certificate with admission for degree purposes, with Mathematics - at least 60%, Physical Sciences (Natural Sciences) - at least 50%, Life Orientation - at least 50% as well as two official languages, including English or Afrikaans with at least 50%, and an APS (Admissions Point Score) of 30.

NB: Candidates who do not comply with the requirement regarding Physical Science (Natural Sciences) may only be admitted to the degree if the study programme is compiled from modules for which Physical Science (Natural Sciences) is not a prerequisite.
Candidates may also follow this study programme through the BSc: Four-year Programme.

(b) Duration
Four years of full-time study.

(c) Promotion requirements
A student will be promoted to the following year of study if less than 50 credits need to be carried over, unless the Dean on the recommendation of the head of department decides otherwise. A student who does not comply with the requirements for promotion to the following year of study, retains the credit for the modules already passed and may be admitted by the Dean, on recommendation of the head of department, to modules of the following year of study to a maximum of 50 credits, provided that it will fit in with both the lecture and examination timetable.

(d) Curriculum
A minimum of 504 credits are required to obtain the degree.

Module code	Module description	Credits	Prereq.
Faculty Requirement			
WTW 114	Calculus 114 **or**	(16)	Par.1.2
WTW 134	Mathematics 134	(16)	Par.1.2

General requirements (258)

CIL 111	Computer Literacy 111	(4)	
SLK120	Biological Basis of Behaviour 120	(12)	
CIL121	Information Literacy 121	(4)	
SCE 171	Religious Instruction 171	(8)	
SCE 201	Science Education 201	(16)	
FIL 254	Philosophy of Science 254	(10)	
SCE 303	Science Education 303	(36)	SCE 201

Additional requirements

Two year modules† at 200-level, both of which should be recognised school subjects. As a guideline, 48 credits per year module for a total of 96 credits on 200-level should be obtained. Deviation from this is possible upon approval by the programme co-ordinator and the dean, bearing in mind that the total amount of credits required for the degree is not affected by such a deviation.

At least 72 credits at 300-level of a single year module (two sequential semester modules) that is presented in the Faculty of Natural and Agricultural Sciences. In addition an elective module(s) worth at least 24 credits on 300-level must be passed.

The following modules are presented by the Faculty of Education at the Groenkloof Campus as part of the PGCE (Postgraduate Certificate in Education) programme. These modules also constitute the fourth year of the BSecEd(Sci) degree and must be taken by final year (4th year) BSecEd(Sci) students.

Fundamental modules

GPE 400	Global Perspectives in Education 400	(6)
FOE 400	Foundations of Education 400	(6)

Core modules

LNT 400	Learning Theories 400	(12)
FCL 400	Facilitating Learning 400	(24)
ASS 400	Assessment 400	(12)
PEL 400	Professional Ethics and Law 400	(6)
COE 400	Social Context of Education 400	(12)
PPF 400	Professional Portfolio 400	(12)

Further Education and Training

(Choose one in accordance with the degree subject on 300 level) (24)

VLW 400	Subj. Did in Life Sciences 400
VGG 400	Subj. Did in Geography 400
VNS 400	Subj. Did in Physical Science 400
VWS 400	Subj. Did in Mathematics 400
VIG 400	Subj. Did in Inform. Technology 400

Outstanding credits

Students may, in consultation with the Dean, take modules not listed in the Syllabi.

† A year module is equivalent to two successive semester modules in one subject. You are also refered to point (k).

(e) Teaching Practice

A student must gain teaching experience by means of:

(i) Attending demonstration lessons.

(ii) School Practice as incorporated in the PGCE program in the 4th year.

(f) Language Endorsement

Students must demonstrate the ability to teach in at least two official languages, of which one must be either English or Afrikaans.

(g) Compulsory language modules

The academic literacy modules (EOT 110 and 120) are compulsary.
Subject to satisfactory performance in the prescribed academic literacy test, all or some of the above academic literacy modules must be replaced by EOT 161 and EOT 162. Other options may be taken upon approval by the BSecEd(Sci) co-ordinator.

(h) Religious Instruction (SCE 171)

Required by the Department of Education. A student may apply for exemption on the grounds of conscientious objection, only if a module of at least 8 credits is taken in the place of Religious Instruction.

(i) Professional studies

The professional studies component of the programme consists of the PGCE modules in the fourth year.

(j) Education

Education consist of Science Education (SCE 201 and SCE 303) as well as the PGCE modules.

(k) Recognised school subjects

Subject	Level	Modules
Biology*††	100	MLB 111 and ZEN 161 and BOT 161
Biology*††	200	Appropriate modules in Plant Science or Zoology/Entomology or Physiology at 200-level.
Chemistry**	100	CMY 117, 127
Chemistry**	200	CMY 282,283,284,285
Physics**	100	PHY 171
Physics**	200	PHY 253, 254, 263.
Natural Science	200	GLY 151, GGY 252, 355 or 361 GLY 162 or WKD 164 or a combination of appropriate modules in Chemistry and Physics at 200-level, on the recommendation of the head of department and with the approval of the Dean.
Geography	100	GGY 132, 162, 156, 157, 166, WKD 164
Geography	200	GGY 252, 283, 263, 264
Agriculture††	100	In consultation with the Programme Manager: Agricultural Sciences and with approval from the Dean.

Agriculture††	200	In consultation with the Programme Manager: Agricultural Sciences and with approval from the Dean.
Computer Science	100	COS 110, COS 130, COS 216 or COS 212.
Computer Science	200	4 modules from: COS 216, 212, 214, 222.
Mathematics	100	WTW 114,126,128
Mathematics	200	WTW 211, 389 plus a suitable combination of credits to the value of 24 from WTW

NB: All modules of a subject must be passed for the subject to be recognised as a school subject.

* Zoology, Plant Science and Biology are the equivalent of only one recognised school subject. A recognised module must be passed at 100-level.

** Physics, Chemistry and Physical Science are the equivalent of only one recognised school subject and is only accepted if a full year module (two consecutive semester modules) is passed in both Chemistry and Physics at 100-level.

†† The combination ZEN 251 and BOT 251 is the equivalent of Biology at 200-level, but does not lead to admission to modules at 300 level.
The combination with MLB 111, BOT 161, ZEN 161 together with appropriate second-year modules in Zoology, Plant Science and Physiology can lead to admission to modules at 300-level.

(l) Special examination in the Faculty of Natural and Agricultural Sciences

A final-year student who requires a maximum of 36 credits to comply with all the requirements for the degree, may be admitted by the Dean on the recommendation of the relevant head(s) of department, to special examinations in the modules he or she has failed, provided that this will enable them to qualify for the degree. Students with a final mark of less than 40% in any of the failed modules, or who have previously been admitted to a special examination, do not qualify for a special examination. (Also consult Reg. 12)

(m) Degree with distinction

The BSecEd(Sci) degree is conferred with distinction on a student who obtains a weighted average of at least 75% in:

(i) A compulsory year module at 300 level.
(ii) The PGCE modules.

Sc.8 DIPLOMAS

A National Senior Certificate must be included in all applications.

ADVANCED UNIVERSITY DIPLOMA IN EXTENSION AND RURAL DEVELOPMENT (Code 03120200)

The admission requirements are:

- an appropriate initial university diploma in one of the Agricultural disciplines plus one year appropriate extensive experience; or

- an appropriate BTech degree or National Diploma plus one year relevant extensive experience; or
- an appropriate Agricultural Diploma or related diploma plus five years' relevant extensive experience; or
- a qualification deemed appropriate by the Senate of the University plus approved experience (RPL).

Sc.9 SYLLABI

Sc.9.1. SYLLABI FOR BSC, BSC(AGRIC) AND BCONS.SC.

List of codes:

Fac Dept: = The Faculty in which the timetable for the particular module is determined and the department that offers the module.

NAS BCM = Faculty of Natural and Agricultural Sciences Department of Biochemistry
NAS BOT = Faculty of Natural and Agricultural Sciences Department of Plant Science
NAS CMY = Faculty of Natural and Agricultural Sciences Department of Chemistry
NAS FLG = Faculty of Natural and Agricultural Sciences Department of Physiology
NAS FSK = Faculty of Natural and Agricultural Sciences Department of Physics
NAS GGY = Faculty of Natural and Agricultural Sciences Department of Geography, Geoinformatics and Meteorology
NAS GLY = Faculty of Natural and Agricultural Sciences Department of Geology
NAS GTS = Faculty of Natural and Agricultural Sciences Department of Genetics
NAS LEK = Faculty of Natural and Agricultural Sciences Department of Agricultural Economics, Extension and Rural Development
NAS MBY = Faculty of Natural and Agricultural Sciences Department of Microbiology and Plant Pathology
NAS PGW = Faculty of Natural and Agricultural Sciences Department of Plant Production and Soil Sciences
NAS SCI = Faculty of Natural and Agricultural Sciences Gold Fields Computer Centre for Education
NAS VBR = Faculty of Natural and Agricultural Sciences Department of Consumer Science
NAS VDW = Faculty of Natural and Agricultural Sciences Department of Food Science
NAS VKU = Faculty of Natural and Agricultural Sciences Department of Animal and Wildlife Sciences
NAS VWT = Faculty of Natural and Agricultural Sciences Department of Insurance and Actuarial Sciences
NAS WST = Faculty of Natural and Agricultural Sciences Department of Statistics
NAS WTW = Faculty of Natural and Agricultural Sciences Department of Mathematics and Applied Mathematics
NAS ZEN = Faculty of Natural and Agricultural Sciences Department of Zoology and Entomology
EB BDO = Faculty of Economic and Management Sciences Department of Human Resource Management
EB BEM = Faculty of Economic and Management Sciences Department of Marketing and Communications Management
EB EKN = Faculty of Economic and Management Sciences Department of Economics

EB FRK	=	Faculty of Economic and Management Sciences Department of Accounting and Financial Management
EB INF	=	Faculty of Economic and Management Sciences Department of Informatics
EB OBS	=	Faculty of Economic and Management Sciences Department of Business Management
EB TBE	=	Faculty of Economic and Management Sciences Department of Tourism Management
GW EOT	=	Faculty of Humanities Unit for the Development of Language Skills
GW FLG	=	Faculty of Humanities Department of Physiology
GW KGK	=	Faculty of Humanities Department of Visual Arts
GW MTL	=	Faculty of Humanities Department of Ancient Languages
GW SLK	=	Faculty of Humanities Department of Psychology
GW SOC	=	Faculty of Humanities Department of Sociology
GW VKK	=	Faculty of Humanities Department of Visual Arts
ING COS	=	Faculty of Engineering, Built Environment and Information Technology Department of Computer Science
MED ANA	=	Faculty of Health Sciences Department of Anatomy
MED FAR	=	Faculty of Health Sciences Department of Pharmacology
OPV OPV	=	Faculty of Education Faculty of Education
RGL RGL	=	Faculty of Law Faculty of Law
VET ANA	=	Faculty of Veterinary Science Department of Anatomy and Physiology
VET PAS	=	Faculty of Veterinary Science Department of Production Animal Studies

Language: Medium of instruction of the module
English: Medium of instruction is English.
Afrikaans: Medium of instruction is Afrikaans.
Double: Both Afrikaans and English are used in the class.
Bilingual: Separate classes for Afrikaans and English.

lpw/ppw: lectures per week/ practicals per week (e.g.: 3+1 = 3 lectures and 1 practical per week)
dpw: discussion classes per week

Quarter: The quarter in which the specific module is presented.
J1 = the whole year (year module: extends over two semesters)
S1 = the first semester (K1 + K2); S2 = the second semester (K3 + K4)
K1 = first quarter; K2 = second quarter; K3 = third quarter; K4 = fourth quarter

Credits: Credit value of a module.

Prerequisite modules: clarification: minimum requirements

[ ]	Code in brackets: [AGR313]	Obtained a minimum of 50%
#	Code followed by #: AGR313#	Concurrent registration
GS	Code followed by GS: AGR313GS	Average of 40% - 49%

TDH: Approval from the head of department is required to register for the module.

Par 1.2: Refers to the requirements for specific modules that appear at the beginning of this publication.

Module	Title				
Fac_Dept	**Old code**	**Language**	**lpw/ppw**	**Term**	**Credits**
AGR313	**PRIMARY_FOOD_CROPS_313**				
NAS_PGW	AGR351,352	Bilingual	2 + 0.5	S1	14
The cultivation of important vegetables including tomatoes, the cucurbits, the cabbage family and onions. Botanical characteristics, classification, growth requirements, production practices and exploitation of the plant – environment interaction with applicable production practices in the field and in a controlled environment. Visits to fresh produce markets, seed and chemical companies, research institutions and growers. **Prerequisites:** [HSC260] and [PPK251]					
AGR361	**INDUSTRIAL_CROPS_361**				
NAS_PGW	AGR323	Bilingual	2 + 0.5	S2	14
Botanical characteristics, classification, growth requirements, production practices and utilization of crops rich in oil and protein, fibre crops, tobacco, sugarcane and diverse crops. Visits to research institutions and producers. **Prerequisites:** [HSC260] and [PPK251]					
AGV410	**AGRARIAN_EXTENSION_410**				
NAS_LEK	n a	Bilingual	2 + 0	S1	20
The objective, philosophy and ethics of extension. Technology and agricultural production. Distribution and diffusion of technology. Group dynamics, the functioning and handling of groups. Leadership, leadership functions and types. Extension organisation.					
AGV412	**GROUP_DYNA.LEADSH.&COM.FAC.412**				
NAS_LEK	n a	English	3 + 0	S1	20
Community - concept and meaning; the community and change; hindrances to change. The use of small groups in the community; group dynamics; group and community goals. The paradigm shift from directing to facilitating; group techniques; participative techniques. Leadership development in communities. Case studies.					
AGV413	**COMMUNICATION_413**				
NAS_LEK	n a	English	2 + 0	J1	20
Nature and importance of development communication; the process and models of communication; critical elements and factors in communication; symbol systems and non-verbal communication. Credibility, messages and message treatment; audience and audience identification; channels and methods of communication. Effective listening and feedback. Practical training in communication: Effective speaking; visual aids in communication; managing conflict; report writing.					
AGV415	**PRINC.&APPRO.OF_DEVEL.&EXT_415**				
NAS_LEK	n a	English	2 + 0	J1	20
The role, importance and nature of extension and development; ethics in development and extension. International approaches to development and extension; paradigm shifts within extension and development. The Third World: concept, characteristics and					

change. The subsistence farmer, rural poverty and the deprivation trap. Development practice and theories. Participation; appropriate technology; role players and responsibilities in development.					
AGV421	**COMMUNICATION_421**				
NAS_LEK	n a	Bilingual	2 + 0	S2	20
Communication: Definition and clarification of concepts. Theory and elements of communication. Verbal and non-verbal communication. Determinants of interpersonal communication. Abating factors impeding communication. Nature, classification and efficiency of communication channels.					
AGV426	**PROGRAMME_&_PROJECT_PLAN.426**				
NAS_LEK	n a	English	2 + 0	J1	20
Nature, purpose and principles of a programmed and purposeful approach. Institutional framework for community participation, ownership and empowerment; linking with complementary and support services. Participative need appraisal, problem identification and delimitation; PRA methods and techniques; problem conceptualisation and development of survey instrument; situation surveys and analyses; formulation of objectives; identification and scheduling of methods and activities; work plan or calendar construction, budgeting.					
AGV428	**EVAL.OF_DEVEL.&DEVEL.PROJS.428**				
NAS_LEK	n a	English	2 + 0	J1	20
Reasons and purposes of evaluation; expectations from evaluations; role players and motives in evaluation. Criteria and indicators of development, development projects and development organisations. Methods of evaluation; formulation of objectives and scale construction for evaluation; developing and coding the measuring instrument. Sampling and sampling techniques; data analysis and interpretation; evaluation report.					
AGV429	**BEHAVIOUR_CHANGE_&INTERVEN.429**				
NAS_LEK	n a	English	2 + 0	J1	20
Characteristics of human behaviour; basic concepts: perception, defence mechanism, decision making and problem solving, learning, innovativeness and adoption behaviour; diffusion of innovations: elements and phases of diffusion, opinion leaders and contact farmers, methodological implications for extension. Psychological, cultural and social barriers to change. Behaviour change or modification: comparison of different approaches and strategies. A practical model: Background principles and theories, identifying “forces” or behaviour determinants; designing effective extension messages for development programmes.					
ANA121	**INTR.:_HUMAN_ANAT.&_EMBRIOL121**				
MED_ANA	n a	Bilingual	1 + 1	S2	4
Terminology, musculo-skeletal system, nervous system, surface anatomy, cardiovascular system, respiratory system, urogenital system, gastro-intestinal system, endocrine system, introductory osteology and joints, introductory embryology. **Prerequisite:** [MLB111 GS]					
ANA122	**HUMAN_OSTEOLOGY_122**				
MED_ANA	n a	Bilingual	1 + 1	S2	4
Introduction to osteology, bone function and classification, humerus, radius, ulna,					

femur, tibia, fibula, clavicle, scapula, ribs, sternum, vertebrae, pelvis, hand and foot bones, sesamoid bones, skull, mandible, joints.					
ANA126	**BASIC_HUMAN_HISTOLOGY_126**				
MED_ANA	n a	Bilingual	1 + 1	S2	4
General introduction to cells and tissue, terminology, the cell and cytoplasm, organelles and inclusions, surface and glandular epithelium, general connective tissue, specialised connective tissue, namely cartilage, bone, blood and haemopoietic tissue, muscle and nervous tissue. **Prerequisites:** [CMY117 GS] and [MLB111 GS]					
ANA214	**HUMAN_CELL_&_DEVELOPM.BIOL.214**				
MED_ANA	n a	English	2 + 1	S1	12
Functional review of the cell and cell content. Normal and abnormal cell function in relation to structure. Control of the human cell, heredity and the human genome. Cell communication, growth and development, adhesion and division. Aspects of cellular research. Techniques on how to study cells. Medical cell and molecular biology application. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisites:** [ANA121] and [ANA126]					
ANA215	**PALEO-ANTHROPOLOGY_215**				
MED_ANA	n a	English	2 + 1	S1	10
Introduction to paleoanthropology, focussing on hominid fossil record, principles of evolution, principles of heredity, human variation, introduction to primatology, hominide taxonomy, time-frames and dating methods, fossilation and tafonomy, trends in hominide evolution, hominide areas. Australopithecus, Homo habilis, Homo erectus, Homo sapiens neanderthalensis, the origin of anatomically modern human beings, DNA studies, paleo-environments, hominide diets, introduction to the development of culture, South African populations.					
ANA217	**HUMAN_ANATOMY_217**				
MED_ANA	n a	English	2 + 1	S1	16
Regional approach to human anatomy. Cadaver dissection of the upper and lower limbs, back, thorax, abdomen, pelvis, perineum and genital area. Anatomical techniques. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisites:** [ANA121] and [ANA122]					
ANA226	**HUMAN_HISTOLOGY_226**				
MED_ANA	n a	English	1 + 1	S2	10
General introduction to organ structure. Terminology. The eye, ear, skin, circulatory system, nervous system, lymphoid system, gastrointestinal tract, gastrointestinal tract glands, respiratory system, urinary system, andrological and female reproductive systems, endocrine system. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisite:** [ANA126]					
ANA227	**HUMAN_ANATOMY_227**				
MED_ANA	n a	English	2 + 2	S2	16
Regional approach to human anatomy. Cadaver dissection of the head, neck as well as					

neuro-anatomy. Anatomical techniques. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisite:** [ANA217 GS]					
ANA315	**FORENSIC_ANTHROPOLOGY_315**				
MED_ANA	n a	English	2 + 1	S1	16
Introduction to forensic anthropology, detection of graves, excavation of graves, human vs. animal bone, forensic entomology, osteometry, cranial and post-cranial measurements, non-metric features of the skeleton, age determination, sex determination, race determination, ante-mortem stature, dental analysis, osteopathology, factors of individualisation, measurements of the face, introduction of face mapping and skull-photo superimposition, legal aspects. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisites:** [ANA122] and [ANA215]					
ANA316	**HISTOLOGY_TECHNIQUES_316**				
MED_ANA	n a	English	2 + 2	S1	16
General introduction to light and electron microscopic techniques: fixation, processing, imbedding, staining. Principles of different staining techniques for LM and EM: routine stains, proteins, carbohydrates, amino acids, metachromasia, immunocytochemistry, lectin stains, specialised stains. Principles of the operation of LM and EM: general LM, fluorescent microscopy, differential contrast microscopy, dark field microscopy, phase contrast microscopy, transmission and scanning electron microscopy. **Prerequisite:** [ANA226]					
ANA324	**HUMAN_CELL_&_DEVEL.BIOLOGY_324**				
MED_ANA	n a	English	2 + 1	S2	14
Practical aspects of cell biology. Cell, tissue, organ, and organism culture. The biology of the culture environment. Cellular basic of morphogenesis, cleavage patterns and gastrulation. The early vertebrate development; neurilation, ecto-, meso- and endoderm derivatives. Cell destiny and embryonic axis including malformations. Development of the Tetrapod limb and cell death. Cell interactions at a distance through hormones and metamorphosis. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisites:** [ANA214] and [ANA226]					
ANA327	**COMPARATIVE_ANATOMY_327**				
MED_ANA	n a	English	1 + 1	S2	14
Introduction to comparative anatomy. Introduction to comparative osteology. Comparative anatomy of the appendicular skeleton. Comparative anatomy of the axial skeleton. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisites:** [ANA121] and [ANA122] and [ANA217] and [ANA227]					
ANA328	**APPL.RESEARCH_TECHNIQUES_328**				
MED_ANA	n a	English	0 + 1	S2	8
Introduction to research. Development of research project. Research skills. Completion of research project. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students. **Prerequisites:** [ANA315] and [ANA316]					

APS461	**CROP_PHYSIOLOGY_461**				
NAS_PGW	PPK411	English	2 + 0.5	S2	14
Physiology of growth, yield, and quality; effect of environmental factors upon plant carbon budget, source – sink relationships, stress physiology, growth analysis and modelling. Growth manipulation. **Prerequisites:** [GKD250] and [GKD260] and [HSC260] and [PGW350]					
APZ325	**LIVESTOCK_BREEDING_325**				
NAS_VKU	n a	English	2 + 0	S2	10
Introduction to applied animal breeding and genetics: Genetic defects in farm and companion animals (single gene and multifactor characteristics). Phenotypic expression of genes in qualitative and quantitative inheritance. Principles of breeding and selecting farm and companion animals, breeding systems, application and interpretation of breeding values and animal recording schemes. **Prerequisite:** [GTS261]					
ARD480	**AGRIC.&_RURAL_DEVELOP.STUD.480**				
NAS_LEK	n a	English	3 + 0	J1	40
Overview of the concepts and theories of rural development; the role of agriculture in rural development. Rural livelihood systems: household farming systems; decisions and the operation of farming systems; Non-farm enterprises and SMMEs in the rural economy; household food security. Rural institutions: Definitions and role of institutions; land tenure; rural financial markets; local institutional development; human capital, knowledge systems. Methodologies for Rural Development: The farming systems approach; participatory techniques; Assessment of land use patterns (zoning techniques); Typology techniques; technology transfer and decisionmaking support; communication for rural development; planning rural development at local level.					
ARD482	**RESOURCES_AND_DEVELOPMENT_482**				
NAS_LEK	n a	English	3 + 0	S1	20
Review of the most important physical-biological agricultural resources - soil, water, climate, topography, plant species, animal species; differences in characteristics, quality and vulnerability; the concept of optimum land use; resource conservation; general ecological principles; examples of problems caused by mismatching of physical-biological resources and land use during development planning; principles of sensible technology transfer.					
ASS400	**ASSESSMENT_400**				
OPV_KS	n a	Bilingual	+	J1	12
Assessment 400 Theory and practice of educational assessment. Recording and reporting of assessment. Self-assessment, peer assessment and formal assessment. Accommodations and alternative assessment of learners with a disability. The principles of designing the professional portfolio presentation and using it for assessment.					
BCM253	**INTR.TO_PROTEINS_&_ENZYMES_253**				
NAS_BCM	BCM251	Bilingual	2 + 0	S1	9
Structural and ionic properties of amino acids. Peptides, the peptide bond, primary, secondary, tertiary and quaternary structure of proteins. Interactions that stabilize protein structure, denaturation and renaturation of proteins. Introduction to methods for					

the purification of proteins, amino acid composition, and sequence determinations. Introduction to enzyme kinetics and enzyme inhibition. Allosteric enzymes, regulation of enzyme activity, active centres and mechanisms of enzyme catalysis. Examples of industrial applications of enzymes. **Prerequisites:** [BCM254 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					
BCM254	**PRAC:INTR.TO_PROT.&ENZYMES_254**				
NAS_BCM	BCM251	Bilingual	0 + 0.5	S1	3
Laboratory techniques and Good Laboratory Practice. Techniques for the quantitative and qualitative analysis of biological molecules. Processing and presentation of scientific data. **Prerequisites:** [BCM253 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					
BCM255	**CARBOHYDRATE_METABOLISM_255**				
NAS_BCM	BCM252	Bilingual	2 + 0	S1	9
Biochemistry of carbohydrates. Thermodynamics and bioenergetics. Glycolysis, citric acid cycle and electron transport. Glycogen metabolism, pentose-phosphate pathway, gluconeogenesis and photosynthesis. **Prerequisites:** [BCM256 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					
BCM256	**PRAC:CARBOHYDRATE_METABOL._256**				
NAS_BCM	BCM252	Bilingual	0 + 0.5	S1	3
Study and analysis of metabolic pathways and enzymes. Scientific method and design: Hypothesis design and testing, method design and scientific controls. **Prerequisites:** [BCM255 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					
BCM263	**LIPID_&_NITROGEN_METABOLI._263**				
NAS_BCM	BCM261	Bilingual	2 + 0	S2	9
Biochemistry of lipids, membrane structure, anabolism and catabolism of lipids. Nitrogen metabolism, amino acid biosynthesis and catabolism. Biosynthesis of neurotransmitters, pigments, hormones and nucleotides from amino acids. Catabolism of pureness and pyrimidines. Therapeutic agents directed against nucleotide metabolism. Examples of inborn errors of metabolism of nitrogen containing compounds. The urea cycle, nitrogen excretion. **Prerequisites:** [BCM264 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					
BCM264	**PRAC:LIPID_&_NITROG.METABO.264**				
NAS_BCM	BCM261	Bilingual	0 + 0.5	S2	3
Scientific writing skills: evaluation of a scientific report. Techniques for separation and analysis of biological molecules. **Prerequisites:** [BCM263 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					
BCM265	**BIOCHEMISTRY_IN_PERSPECT_265**				
NAS_BCM	BCM262	Bilingual	2 + 0	S2	9
Integration of metabolic pathways; biochemistry and nutrition; hormones and second messengers; hormonal control in metabolism; a case study in connectivity among metabolic pathways, nutrition, regulation and the immune system. **Prerequisites:** [BCM266 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					

BCM266	PRAC:BCM_IN_PERSPECTIVE_266				
NAS_BCM	BCM262	Bilingual	0 + 0.5	S2	3
Study of structure-function relationships and biological activity. Critical evaluation of results and identification of patterns or tendencies in observations. **Prerequisites:** [BCM265 #] and [CMY117 GS] and [CMY127 GS] and [MLB111 GS]					
BCM271	**BIOCHEMISTRY_PRACTICAL_271**				
NAS_BCM	n a	English	0 + 1	J1	12
(Note: for students majoring in Biochemistry only) Basic biochemical separation methods, experimental design, biochemical calculations. **Prerequisites:** BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254] and [CMY283] and [CMY284]					
BCM351	**BIOCHEMISTRY_OF_PROTEINS_351**				
NAS_BCM	n a	Bilingual	2 + 1	K1	9
Biochemistry of amino acids, peptides and proteins. Chemical modification of amino acids. Primary, secondary, tertiary and quaternary structure, protein folding, sequence motifs and domains, supersecondary and supramolecular structure, self assembly. Practical: Subcellular fractionation (CBE) and purification of proteins. HPLC of proteins (CBE). Dipeptide sequencing and electrophoresis of proteins. **Prerequisite:** [BCM253 + BCM254]					
BCM352	**PROTEOME_ANALYSIS_352**				
NAS_BCM	n a	English	2 + 1	K2	9
Analysis of amino acid composition and sequence of proteins. Isolation and characterization of proteins. Introduction to proteomics. Sequence-based characterisation of proteins, scoring matrices and algorithms. Basic techniques for three-dimensional modelling and characterization. Practical: Introduction to bioinformatics in protein structure-function relation investigations. **Prerequisites:** [BCM253 + BCM254] and [BCM351 GS]					
BCM354	**BIOCHEM._OF_NUCLEIC_ACIDS_354**				
NAS_BCM	n a	English	1 + 0.5	S1	9
Biochemistry of nucleic acids, nucleotides and nitrogen bases. Chemical modification of nucleotides and nucleic acids. Primary, secondary and tertiary structure of nucleic acids and sequence-induced conformational types. Sequence-based analysis and comparison, characterisation of functional regions and genome analysis. Hybridization of nucleic acid strands, thermodynamics and kinetics of the process. Reversible interactions between small ligands (dyes and antibiotics) and nucleic acids. Interaction between nucleic acids and nucleic acids binding proteins. Enzymology of gene manipulation. Principles of the Polymerise Chain Reaction (PCR). Nucleotide sequence determination of nucleic acids. Chemical synthesis and use of oligonucleotides. **Prerequisites:** [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]					
BCM355	**IMMUNOBIOLOGY_355**				
NAS_BCM	n a	Bilingual	1 + 0.5	S1	9
Adaptive and innate immunity. Complement. Organs and cells of the immune response. Cell killing: Phagocytosis, apoptosis and necrosis. Anatomy and ontogeny (development) of the immune system. Chemical and cellular techniques of					

immunology. The origin of diversity in antigen receptors. Practical: Working with experimental animals, the synthesis of hapten-protein conjugate, immunization, bleeding and serum production and an immuno-assay. **Prerequisites:** [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] and [BCM253 + BCM254]					
BCM362	**NUTRITIONAL_BIOCHEMISTRY_362**				
NAS_BCM	n a	English	1 + 0	K3	4
Proximate analysis of nutrients. Review of energy requirements and expenditure. Metabolism of energy-yielding nutrients. Requirements and function of water, vitamins and minerals. Interpretation and modification of RDA values for specific diets, eg growth, exercise, pregnancy and lactation, aging and starvation. Comparison of monogastric and ruminant species. Composition of triglycerides, fatty acids and arteriosclerosis. Cholesterol, polyunsaturated, essential fatty acids and dietary anti-oxidants. Interactions between nutrients. Biochemical functions of water and fat-soluble vitamins and assessment of vitamin status. Mineral requirements, biochemical function, imbalances and diarrhea.					
BCM363	**XENO_BIOCHEMISTRY_363**				
NAS_BCM	n a	English	1 + 0	K4	5
Metabolism of xenobiotics: absorption, distribution, metabolism and excretion; oxidation/reduction (Phase I), conjugations (Phase II), export from cells (Phase III); factors affecting metabolism and disposition. Toxic responses: tissue damage and physiological effects; teratogenesis, immunotoxicity, mutagenesis and carcinogenesis. Examples of toxins: biochemical mechanisms of common toxins and their antidotes.					
BCM364	**BUILDING_THE_CELL_364**				
NAS_BCM	n a	English	1 + 0.5	S2	9
Membrane structure: plasma membrane structure, organisation of lipid membranes, membrane proteins, glycoproteins and glycolipids, principles of membrane organisation, specialisations of the plasma membrane. Transport across cell membranes: major types of membrane transport proteins; diffusion of small molecules across pure phospholipid bilayers; uniporter-catalysed transport of specific molecules; ion channels, intracellular ion environment and membrane electric potential; active ion transport and ATP hydrolysis; cotransport catalysed by symporters and antiporters; osmosis, water channels and the regulation of cell volume. Organelle biogenesis: mitochondrial DNA; synthesis and localisation of mitochondrial proteins; chloroplast DNA and the biogenesis of chloroplasts and other plastids, peroxisome biosynthesis; protein traffic into and out of the nucleus. Synthesis and sorting of plasma membrane, secretory and lysosomal proteins.					
BCM365	**IMMUNOBIOCHEMISTRY_365**				
NAS_BCM	n a	Bilingual	1 + 0.5	S2	9
Interactions between antigens and antibodies: Quantitative and qualitative properties, regulation of the immune response, integrated immunology. Practical: Tutorials on integrated and quantitative immunology. **Prerequisite:** [BCM355 GS]					
BCM366	**ENZYMOLOGY_366**				
NAS_BCM	n a	English	1 + 1	S2	9
Nomenclature: enzyme nomenclature and classification. Specificity and mechanisms:					

the active site, mechanisms of catalysis and examples of specific enzyme mechanisms eg lysozyme and carboxypeptidase A. Enzyme kinetics: derivation of Michaelis-Menten (MM) equation by equilibrium and steady state assumptions, significance of Km and Vmax in the catalytic efficiency of enzymes and linear transformations of the MM equation. Enzyme inhibition: competitive, uncompetitive, non-competitive and irreversible inhibitors with examples of specific toxins and drugs. Multi-substrates: Cleland nomenclature and multi-substrate reactions. Allosteric enzymes: models by Koshland, Hill and Monod. Problems and answers: tutorials of problems and answers based on above concepts. Practicals: isolation of an enzyme, determination of pH and temperature optimum, determination of Km and Vmax, enzyme activation, enzyme inhibition, purification table and final report, oral defense of report.					
BDO181	**INDUSTR._&_ORG._PSYCHOLOGY_181**				
EB_BDO	n a	Bilingual	4 + 0	K2	5
Capita selecta: This course will provide an introduction to personnel psychology, organisational behaviour and labour relations. It will refer to the selection of employees, the training and development of human resources in order to adapt to changing circumstances. The role of leadership in group utilisation and motivation will be discussed both theoretically and practically. Labour relations will be studied in terms of the institutional processes and service relationship and will include practical aspects such as grievance handling, disciplining and dispute resolution.					
BEL220	**TAXATION_220**				
EB_BEM	n a	Bilingual	3 + 0	S2	16
Introduction to taxation, objection and appeal, gross income, source of income, gross income (special inclusions), exempt income, general deduction formula, assessed losses, special deductions for companies, special deductions for individuals, capital allowances.					
BEM110	**MARKETING_MANAGEMENT_110**				
EB_BEM	n a	Bilingual	3 + 0	S1	10
Fundamentals of marketing management and marketing instruments: General overview of marketing management including the marketing concept, the process of marketing management, evolution of marketing and the marketing environment. Consumer entity, market segmentation, positioning and marketing information. Perspective of various marketing instruments in the marketing mix, for example, product decisions, distribution decisions, marketing communication decisions and pricing decisions.					
BEM121	**CONS.BEHAVIOUR&SERV.MARKET.121**				
EB_BEM	n a	Bilingual	3 + 0	S2	10
Part 1: Consumer behaviour: Internal and external influencing factors of consumer behaviour. The consumer's decision process and application fields of consumer behaviour. Consumerisms and social responsibility. Part 2: Introduction to the marketing of services: Acquiring basic marketing skills will enhance the capabilities of marketers of services. This module provides an overview of the seven marketing instruments of a professional services marketing mix. The focus will fall on the practical implications of the characteristics of intangible products and the pricing, promotion, placement, physical evidence, process and people dimensions of services marketing.					

BEM162	**MARKETING_MANAGEMENT_162**				
EB_BEM	n a	Bilingual	3 + 0	K4	5
Introduction to the marketing of professional services: Acquiring basic marketing skills will enhance the capabilities of professionals in inter alia the accounting profession. This module provides an overview of the seven marketing instruments of a professional services marketing mix. The focus will fall on the practical implications of the characteristics of intangible products and the pricing, promotion, placement, physical evidence, process and people dimensions of professional services.					
BEM211	**MARKETING_MANAGEMENT_211**				
EB_BEM	n a	Bilingual	3 + 0	S1	16
Part 1: Product decisions: Problem statement and concept determination of product decisions, management strategies of the organisation, organisational and product strategy, implementation of the product strategy, product and market development strategy and the product life cycle. Part 2: Distribution decisions: The development and management of distribution channels – strategic aims, conventional marketing systems, the main role players, the integration of distribution with the other marketing instruments and relationship marketing; the influence of the external environment on channel design and management; the management of horizontal and vertical marketing systems and the forming of strategic alliances. **Prerequisite:** [BEM110 GS]					
BEM221	**MARKETING_MANAGEMENT_221**				
EB_BEM	n a	Bilingual	3 + 0	S2	16
Part 1: Marketing communication decisions: Integrated marketing communication (IMC) approach; objectives and budgets for IMC programmes; management of advertising; sales promotion; personal selling; direct marketing; sponsorship, interactive media and internet marketing. Evaluation of IMC effectiveness. Part 2: Pricing decisions: Influence of cost, demand and competition on effective pricing decisions; financial analysis of market-based pricing; value and price sensitivity; competitive influences on price determination; psychological aspects of pricing and strategic pricing decisions. **Prerequisite:** [BEM110 GS]					
BEM252	**MARKETING_MANAGEMENT_252**				
EB_BEM	n a	Bilingual	3 + 0	K2	8
Marketing research: The use of marketing research in marketing decision making; the process of marketing research, research designs, random tests, consumer surveys, questionnaires, experimentation, observation, data analysis and analyses of marketing models. Scientific approach to marketing information, the influence of modern tendencies (computers, internet).					

BEM311	**MARKETING_MANAGEMENT_311**				
EB_BEM	n a	Bilingual	3 + 0	S1	20
Part 1: Brand management: The scope of brand awareness, brand name associations and customer-brand relationships. The development of brand name concept management, brand name extensions and co-branding. Exploring direct marketing and brand name management, brand name architecture and brand name custodianship. The brand name communication process, brand name decisions, brand name identity, brand name loyalty and brand name equity. The design of marketing strategies to establish and extend brand name equity. Part 2: Marketing research: The use of marketing research in marketing decision making; the process of marketing research, research designs, random tests, consumer surveys, questionnaires, experimentation, observation, data analysis and analyses of marketing models. Scientific approach to marketing information, the influence of modern trends (computers, Internet). Integrated application of marketing research principles are assessed. **Prerequisites:** [BEM110] and [BEM121]					
BEM321	**MARKETING_MANAGEMENT_321**				
EB_BEM	n a	Bilingual	3 + 0	S2	20
Part 1: Strategic issues in marketing: Multi-level marketing; relationship marketing; e-marketing; brand loyalty; generation segmentation; knowledge management and ethics in marketing. Case studies, group discussions, seminars, and visits to/by organisations for meaningful integration of the theory and practice. Part 2: Strategic marketing: Strategic analysis; customer management; market strategies; globalization; strategy implementation; marketing planning and strategy evaluation and control. Case studies, group discussions, seminars, and visits to/by organisations for meaningful integration of the theory and practice. **Prerequisites:** [BEM211 GS] and [BEM221 GS]					
BEM781	**MARKETING_MANAGEMENT_781**				
EB_BEM	n a	English	3 + 0	S2	20
Information available at the Department					
BER210	**BUSINESS_LAW_210**				
EB_BEM	n a	Bilingual	3 + 0	S1	16
Basic principles of Law of Contract. Law of sales, credit agreements, lease.					
BER220	**BUSINESS_LAW_220**				
EB_BEM	n a	Bilingual	3 + 0	S2	16
Labour Law. Aspects of Security Law. Law of Insolvency. Entrepreneurial Law; Company Law, Law concerning close corporation. Law of Partnerships.					
BIF310	**BIOINFORMATICS_310**				
NAS_BCM	n a	English	1 + 1	S1	9
Concepts in Biological sequence analysis. Biological Data Structures. Deriving and Using Scoring Matrices. Theory and Application of Sequence Alignment Algorithms.					

Nucleic Acid Feature Analysis and Prediction Methods. Protein Feature Analysis and Prediction Methods. **Prerequisites:** [BME120] and [GTS251] and [WTW114 GS or WTW134 GS] or [TDH]					
BIF320	**BIOINFORMATICS_320**				
NAS_BCM	n a	English	2 + 1	S2	18
Computational methods in Bioinformatics. Biological Data Management. Genome Sequencing and Annotation. Proteomics Data Analysis Concepts and Methods. Microarray Data Analysis Concepts and Methods. Protein Structure Prediction Concepts and Methods. Intermolecular Interaction and Biological Pathway Analysis. Common algorithms in Bioinformatics. Programming for Bioinformatics. Introductory Statistics for Bioinformatics. **Prerequisite:** [BIF310]					
BLG260	**GENERAL_MICROBIOLOGY_260**				
NAS_MBY	n a	Bilingual	2 + 1	S2	8
General anatomy and morphology of bacteria, viruses and fungi. Basic nutritional requirements of micro-organisms and the effect of environmental factors on microbial growth. Micro-organisms as essential components of ecospheres: plant, water and soil ecosystems. Food decay, food poisoning and preservation of food by micro-organisms. Basic principles involved in disinfections, sterilization and control of microbes; techniques for microbial repression: sterilization by using heat, radiation, filtration, chemicals; decimation of numbers.					
BME120	**BIOMETRY_120**				
EB_WST	BME161,162	Double	4 + 1	S2	16
Simple statistical analysis: Data collection and analysis: Samples, tabulation, graphical representation, describing location, spread and skewness. Introductory probability and distribution theory. Sampling distributions and the central limit theorem. Statistical inference: Basic principles, estimation and testing in the one- and two-sample cases (parametric and non-parametric). Introduction to experimental design. One- and two-way designs, randomised blocks. *Multiple statistical analysis*: Bivariate data sets: Curve fitting (linear and non-linear), growth curves. Statistical inference in the simple regression case. Categorical analysis: Testing goodness of fit and contingency tables. Multiple regression and correlation: Fitting and testing of models. Residual analysis. Computer literacy: Use of computer packages in data analysis and report writing. **Prerequisites:** [STK113] and [STK123] or [Par 1.2]					
BME210	**BIOMETRY_210**				
EB_WST	BME251,252	English	4 + 1	S1	24
Analysis of variance: Multiway classification. Testing of model assumptions, graphics. Multiple comparisons. Fixed, stochastic and mixed effect models. Block experiments. Estimation of effects. Experimental design: Principles of experimental design. Factorial experiments: Confounding, single degree of freedom approach, hierarchical classification. Balanced and unbalanced designs. Split-plot designs. Analysis of covariance. Computer literacy: Writing and interpretation of computer programmes. Report writing. **Prerequisite:** [BME120]					
BOT161	**PLANT_BIOLOGY_161**				
NAS_BOT	n a	Bilingual	2 + 0.5	S2	8
Basic plant structure and function; introductory plant taxonomy and plant systematics;					

principles of plant molecular biology and applications of plant molecular tools; the ecosystem; adaptation of plants to extreme environments; medicinal compounds from plants; introduction to veld evaluation and veld management.					
BOT251	**SA_FLORA_&_VEGETATION_251**				
NAS_BOT	n a	Bilingual	2 + 1	S1	12
Origin and affinity of South African flora and vegetation types; principles of plant geography; plant diversity in southern Africa; characteristics, environments and vegetation of southern African biomes; major vegetation types of southern Africa; centra of plant endemism; rare and threatened plant species; red data lists; plant conservation; international conventions; local environmental laws; conservation status of southern African vegetation types. **Prerequisite:** [BOT161] or [TDH]					
BOT261	**PLANT_BIOCHEM._EVOLUTION_261**				
NAS_BOT	n a	Bilingual	2 + 1	S2	12
Role of biochemical evolution in the survival of plants as stationary organisms (coordination of outotrophic and heterotrophic metabolism on cellular and whole plant level, nitrogen fixation, defence mechanisms and interaction with other organisms). Families of economic importance, interrelationship between humans and plants; food, medicine, drugs and poisons, landscape architecture, energy, water and industry. **Prerequisites:** [BOT161] and [CMY117] and [CMY127] or [TDH]					
BOT356	**PLANT_ECOPHYSIOLOGY_356**				
NAS_BOT	n a	Bilingual	2 + 1	S1	18
The emphasis is on the efficiency of the mechanisms whereby C3-, C4- en CAM-plants bind CO2 and how it is impacted upon by environmental factors. The mechanisms and factors which determine the respiratory conversion of carbon skeletons and how production is affected thereby will be discussed. Insight into the ecological distribution and manipulation of plants for increased production is gained by discussing the internal mechanisms whereby carbon allocation, hormone production, growth, flowering and fruitset are influenced by external factors. To understand the functioning of plants in diverse environments, the relevant structural properties of plants and the impact of soil composition and water flow in the soil-plant-air continuum will be discussed. Various important techniques in the field of study will be illustrated in the practicals and may be employed to investigate aspects such as: the effect of herbicides on isolated chloroplasts, water-use efficiency of plants, factors affecting stomatal opening, determination of plant stress, photosynthetic rate and nitrogen fixation, compilation of Höfler diagrams and determination of elasticity coefficients. **Prerequisite:** [BOT161] or [TDH]					
BOT357	**CROP_BIOTECHNOLOGY_357**				
NAS_BOT	n a	Bilingual	2 + 1	S1	18
Molecular tools in crop biotechnology; whole crop plant physiology explored by molecular techniques; usefulness of model plants; gene and promoter identification and transfer techniques for crop improvement; investigation of plant transcriptomes using microarrays; molecular analysis of plant reactions to stress; transgenic plant strategies for improved stress resistance in crops. **Prerequisite:** [BOT161] or [TDH]					

BOT358	PLANT_ECOLOGY_358				
NAS_BOT	n a	Bilingual	2 + 1	S1	18

A description of the environment of plants. Theory of plant community concepts, vegetation change over space and time; surveying techniques of vegetation and environmental factors; floristic and structural composition. Data processing techniques; ecological interpretation and description of plant communities. Vegetation and environmental management; vegetation and the grazing animal. An examination of the ecological traits of plant populations; conventional and diagrammatic life tables; population growth and population regulation; population dynamics. Species interactions and an evaluation of their effects on interacting species.
Prerequisite: [BOT161] or [TDH]

BOT365	PHYTOMEDICINE_365				
NAS_BOT	n a	English	2 + 1	S2	18

The course will include a review on the discovery and use of plant medicines and phyto-therapeutically important molecules obtained from plants. Certain aspects of natural product chemistry i.e. the biosynthesis and ecological role of the three main classes of secondary compounds; terpenoids, phenolics, and alkaloids will be discussed. The role of these natural products in defence against microorganisms and herbivores will be presented during the course. The basics of alternative medicines such as homeopathy, ayurvedic medicine, acupuncture etc. will also be discussed. Key skills / practical elements to be covered in the module include modern techniques like high performance liquid chromatography and flash chromatography used for the detection and isolation of active compounds from medicinal plants. Practical drug discovery approaches using chromatographic techniques for phytochemical analysis of secondary metabolites such as tannins, alkaloids, sterols and saponins will be conducted. Bioassays on microorganisms will also be done during the practical sessions in order to develop the skills for the potential discovery of new antibiotics. Visits to several pharmaceutical laboratories will be arranged.
Prerequisite: [BOT161] or [TDH]

BOT366	PLANT_DIVERSITY_366				
NAS_BOT	n a	Bilingual	2 + 0	S2	10

Basic principles and methods of plant classification. Sources of plant variation. Modern methods to ascertain evolutionary relationships among plants. The extent and significance of vascular plant diversity. General structural, and biological characteristics of evolutionary and ecologically important plant groups. Botanical nomenclature.
Prerequisite: [BOT161] or [TDH]

BOT367	PRACT_PLANT_IDENTIFICATION_367				
NAS_BOT	n a	Bilingual	0 + 1	S2	10

Plant identification in practice; identification methods, keys, herbaria and botanical gardens. Diagnostic characters for the field identification of trees, wild flowers and grasses. Family recognition of southern African plants. Available literature for plant identification. Methods to conduct floristic surveys. Nature and significance of voucher specimens.
Prerequisite: [BOT161] or [TDH]

CHM215	**CHEMISTRY_215**				
NAS_CMY	CHM214	Double	3 + 1	S1	16
Organic chemistry. Chemical properties of organic (including aromatic) compounds. Functional group transformation and synthesis. Physical Chemistry. Colloid chemistry. Surface chemistry and processes at solid surfaces. PVT properties of real gases. **Prerequisites:** [CHM171] and [CHM181]					
CHM226	**CHEMISTRY_226**				
NAS_CMY	CHM216	Double	2 + 1	S2	8
Theory: Introduction to instrumental chemical analysis. Integration of electronic, chemical, optical and computer principles for the construction of analytical instrumentation. Detail discussion of principles and some instrumental methods from three disciplines within analytical chemistry, namely electrochemistry, spectroscopy and chromatography. This includes potentiometry, (AA) atomic absorption-, (ICP) atomic emission-, ultraviolet (UV)-, and infrared (IR) spectroscopy, potentiometric and photometric titrations, gas chromatography, liquid chromatography as well as combinations of these techniques. Practical: IR spectroscopy, UV spectroscopy, AA spectroscopy, potentiometric titration, gas chromatography. (Note: Two lectures per week. Third quarter: Six 3 hour practicals.) **Prerequisites:** [CHM171] and [CHM181]					
CIL111	**COMPUTER_LITERACY_111**				
ENG_SIT	n a	Bilingual	2 + 0	S1	4
Computing Concepts, Windows 2003, Internet & World Wide Web, What will word processing do for me?, Gaining Proficiency Editing & Formatting, Enhancing a document & the web and other resources, Advanced features: Outlines, Styles & selections & Tables, Introduction to PowerPoint, Presentations made easy, Gaining Proficiency - Slide Show Tools, The web & Slide Masters, Introduction to MS Excel: What is a spreadsheet, Gaining Proficiency - The web and business applications, Spreadsheets in Decision Making: What if?, Graphs and Charts: Delivering a Message, Introduction to MS Access: What is a Database?, Tables and Forms: Designs, Properties, Views and Wizards, Information from the Database: Reports and Queries. An exemption examination may be written in the first week of semester 1.					
CIL121	**INFORMATION_LITERACY_121**				
ENG_SIT	n a	Bilingual	2 + 0	S2	4
Why computers matter to you, Networking, Information resources (including the Department of Library Services), Quality of Information, Ethics, plagiarism and copy right, Searching the Internet, Information Seeking Strategies, Location & Access, Specific Search Environments (include all electronic databases and journals in the Department of Library Services applicable to the relevant faculties), Referencing techniques, Use synthesis and evaluation of information, New trends. Content specific to the University of Pretoria. No exemption examination.					
CIL122	**VISUAL_DESIGN_(AUTOCAD)_122**				
ENG_SIT	n a	Double	2 + 0	S2	4
AUTOCAD 122					

CMY117	**GENERAL_CHEMISTRY_117**				
NAS_CMY	CMY152, CMY153	Double	4 + 1	S1	16
Theory: General introduction to inorganic and analytical chemistry. Nomenclature of inorganic ions and compounds, stoichiometric calculations concerning chemical reactions, redox reactions, solubilities, atomic structure, periodicity. Inorganic and physical chemistry. Molecular structure and chemical bonding using the VSEPR models. Chemical equilibrium, acids and bases, buffers, precipitation. Practical: (Note: Four lectures and one 3 hour practical or tutorial per week.) **Prerequisite:** [Par 1.2]					
CMY127	**GENERAL_CHEMISTRY_127**				
NAS_CMY	CMY 161, CMY162	Double	4 + 1	S2	16
Theory: General physical-analytical chemistry: Physical behaviour of gases, liquids and solids, intermolecular forces, solutions: Organic chemistry: Structure (bonding), nomenclature, isomerism, introductory stereochemistry, introduction to chemical reactions and chemical properties of organic compounds and biological compounds, *i.e.* carbohydrates, lipids and aminoacids. Practical: Molecular structure (model building), synthesis and properties of simple organic compounds. (Note: Four lectures and one 3 hour practical or tutorial per week.) **Prerequisite:** [CMY117 GS]					
CMY133	**CHEMISTRY_133**				
NAS_CMY	n a	English	2 + 1.5	S1	8
(This modules includes 3dpw) The field of Chemistry – an overview; Mathematics in Chemistry; atomic theory: historical overview; atoms, molecules and ions; relative atomic mass; electronic structure of atoms; the periodic table; periodicity; chemical bonding. Practicals in chemistry modules last three 50 minute slots and are presented once per fortnight. **Prerequisite:** [BSc 4 year programme]					
CMY143	**CHEMISTRY_143**				
NAS_CMY	n a	English	2 + 1.5	S2	8
(This modules includes 3dpw) Bonding and molecular geometry: VSEPR theory; bonding and organic compounds (structural formulas, classification and nomenclature); matter and its properties; mole concept; reaction stoichiometry; reactions in aqueous solutions: precipitation, acid-base and redox. Practicals in chemistry modules last three 50 minute slots and are presented once per fortnight. **Prerequisite:** [CMY133]					
CMY151	**CHEMISTRY_151**				
NAS_CMY	n a	Bilingual	4 + 1	S1	16
Theory: Introduction to general chemistry: Measurement in chemistry, matter and energy, atomic theory and the periodic table, chemical compounds and chemical bonds, quantitative relationships in chemical reactions, states of matter and the kinetic theory, solutions and colloids, acids, bases and ionic compounds, chemical Equilibria. Introduction to organic chemistry: Chemical bonding in organic compounds, nature, physical properties and nomenclature of simple organic molecules, isomerism, chemical properties of alkanes and cycloalkanes, alkenes, alcohols, aldehydes and					

ketones, carboxylic acids and esters, amines and amides, carbohydrates, proteins, and lipids. Practicals: (Note: Four lectures and one 3 hour practical or tutorial per week.) **Prerequisite:** [Par 1.2]					
CMY154	**CHEMISTRY_154**				
NAS_CMY	n a	English	2 + 1.5	S2	8
This module includes 3dpw. Chemical equilibrium; acid and base equilibria; applications of aqueous equilibria: buffers and solubility; Introduction to electrochemistry; introduction to thermochemistry; organic chemistry: hybridisation, isomers (structural, geometrical and conformational), reactions (substitution, addition and elimination), introduction to reaction mechanisms. Practicals in chemistry modules last three 50 minute slots and are presented once per fortnight.					
CMY282	**PHYSICAL_CHEMISTRY_282**				
NAS_CMY	n a	English	2 + 0.5	S1	12
Theory: Classical chemical thermodynamics, gases, first and second law and applications, physical changes of pure materials and simple compounds. Phase rule: Chemical reactions, chemical kinetics, rates of reactions. Fundamentals of spectroscopy (including NMR). Practicals. (This module also includes a 50min discussion class, every 2nd week.) **Prerequisites:** [CMY117] and [CMY127]					
CMY283	**ANALYTICAL_CHEMISTRY_283**				
NAS_CMY	n a	English	2 + 0.5	S2	12
Theory: Statistical evaluation of data, gravimetric analysis, aqueous solution chemistry, chemical equilibrium, precipitation-, neutralisation- and complex formation titrations, redox titrations, potentiometric methods, introduction to electrochemistry. Practicals. (This module also includes a 50min discussion class, every 2nd week.) **Prerequisites:** [CMY117] and [CMY127]					
CMY284	**ORGANIC_CHEMISTRY_284**				
NAS_CMY	n a	English	2 + 0.5	S1	12
Theory: NMR spectroscopy: Applications, Organic reactivity: Rates and equilibrium. Acidity and basicity. Conjugation and resonance: Allylic systems. Alkenes, alkyl halides, alcohols, ethers. Carbonyl compounds: ketones, aldehydes, carboxylic acids and their derivatives. Dynamic stereochemistry: Nucleophilic substitution, elimination, addition. Practicals. (This module also includes a 50min discussion class, every 2nd week.) Selection criteria based on performance in CMY127 will be applied due to limited capacity in the practical course. **Prerequisites:** [CMY117] and [CMY127]					
CMY285	**INORGANIC_CHEMISTRY_285**				
NAS_CMY	n a	English	2 + 0.5	S2	12
Theory: Atomic structure, structure of solids (ionic model). Co-ordination chemistry of transition metals: Oxidation states of transition metals, ligands, stereochemistry, crystal field theory, consequences of d-orbital splitting, chemistry of the main group elements, acid-base concepts, non-aqueous solvents, electrochemical properties of transition metals in aqueous solution, industrial applications of transition metals. Introduction to IR spectroscopy. Practicals. (This module also includes a 50min discussion class, every 2nd week.) **Prerequisites:** [CMY117] and [CMY127]					

CMY382	PHYSICAL_CHEMISTRY_382				
NAS_CMY	n a	English	4 + 1	K4	18
Theory: Molecular quantum mechanics. Introduction: Shortcomings of classical physics, dynamics of microscopic systems, quantum mechanical principles, translational, vibrational and rotational movement. Atomic structure and spectra: Atomic hydrogen, multiple electron systems, spectra of complex atoms, molecular structure, the hydrogen molecule ion, diatomic and polyatomic molecules, structure and properties of molecules. Molecules in motion: Viscosity, diffusion, mobility. Surface chemistry: Physisorption and chemisorption, adsorption isotherms, surface tension, heterogeneous catalytic rate reactions, capillarity. Practicals. (Note: Four lectures and one 6 hour practical per week.) **Prerequisites:** [CMY282] and [CMY283] and [CMY284] and [CMY285]					
CMY383	**ANALYTICAL_CHEMISTRY_383**				
NAS_CMY	n a	English	4 + 1	K1	18
Theory: Separation methods: Extraction, multiple extraction, chromatographic systems. Spectroscopy: Construction of instruments, atomic absorption and atomic emission spectrometry, surface analysis techniques. Mass spectrometry. Instrumental electrochemistry. Practicals. (Note: Four lectures and one 6 hour practical per week.) **Prerequisites:** [CMY282] and [CMY283] and [CMY284] and [CMY285]					
CMY384	**ORGANIC_CHEMISTRY_384**				
NAS_CMY	n a	English	4 + 1	K3	18
Theory: Aromaticity and aromatic chemistry, synthetic methodology in organic chemistry: Carbon-carbon bond formation: Alkylation at nucleophilic carbon sites, aldol and related condensations, Wittig and related reactions, acylation of carbanions (Claisen condensation). Practicals. (Note: Four lectures and one 6 hour practical and one 50 minute tutorial per week.) **Prerequisites:** [CMY282] and [CMY283] and [CMY284] and [CMY285]					
CMY385	**INORGANIC_CHEMISTRY_385**				
NAS_CMY	n a	English	4 + 1	K2	18
Theory: Structure and bonding in inorganic chemistry: Molecular orbital approach, diatomic and polyatomic molecules, three-centre bonds, metal-metal bonds, transition metal complexes, magnetic properties, electronic spectra, reactivity and reaction mechanisms, reaction types, special topics. Practicals. (Note: Four lectures and one 6 hour practical per week.) **Prerequisites:** [CMY282] and [CMY283] and [CMY284] and [CMY285]					
COE400	**SOCIAL_CONTEXTS_IN_EDUCAT._400**				
OPV_KS	n a	Bilingual		J1	12
Social Context of Education 400 Contextual understanding of the human and sociological development impacting on education with particular reference to following an asset-based approach to managing a diverse, multicultural, multi-ethnic group of learners often contending with problematic home circumstances and under the threat of HIV/Aids.					
COS110	**PROGRAM_DESIGN:INTRODUCTION**				
ING_COS	n a	Double	4 + 1	S1	16
Object-oriented programming, graphical user interfaces and event handling. Teaches					

sound program design, leading to well structured, robust and documented programs. **Prerequisite:** [Par 1.2]					
COS130	**INTRODUCT._TO_PROGRAMMING_130**				
ING_COS	n a	Double	4 + 1	S1	16
This module introduces computer programming, which is a fundamental building block for all of computer science. The process of constructing a program for solving a given problem, of editing it, compiling, running and debugging it, is covered from the beginning. The aim is to master the elements of a programming language, and be able to put them together in order to construct programs using types, objects, libraries, control structures, methods and arrays. The module will teach the importance of good program design, user-friendly interfaces and efficiency. A modern programming language will be used, with emphasis on object-orientation and clean coding. **Prerequisite:** [Par 1.2]					
COS131	**INTRODUCT._TO_PROGRAMMING_131**				
ING_COS	n a	Double	4 + 1	S1	16
The aim of this module is to acquire a sound knowledge of basic computer programming concepts and an introductory knowledge of data structures. The theory of these concepts, as well as design methodologies, will be investigated. Understanding rather than memorising is emphasized in order to stimulate creative thinking and the development of innovative skills amongst students in the field of computer programming. The C-programming language is used to implement these concepts. At the end of the module a short introduction to object-oriented programming using C++ will be given. After completing this module, a student should be able to design and write structured, efficient programs using the C-programming language, be familiar with the basic data structures, pointers and file processing, and have an introductory knowledge of advanced data structures and object-orientation.					
COS151	**INTR.TO_COMPUTER_SCIENCE_151**				
ING_COS	n a	Bilingual	2 + 1	S1	8
This module introduces concepts and terminology related to the hardware of computers, system software and communication systems. It also provides an understanding of basic algorithmic concepts, number systems and binary logic.					
DAF200	**ANIMAL_ANATOMY&PHYSIOLOGY_200**				
NAS_VKU	n a	English	4 + 1	J1	36
General structure and plan of the body of livestock. Types and characteristics of cells and tissues. Body water. Anatomy, physiology and histology of systems: Skin; skeleton; muscles, connective tissue, ligaments, joints; nervous system; sensory organs of sight, sound, smell, touch, taste; circulatory system; respiratory system; endocrinology; male and female reproductive systems; digestive system, gastrointestinal tract, liver, pancreas; kidneys, acid-base balance and homeostasis; lactation; immune system. General species differences. **Prerequisite:** [CMY127] or [TDH]					
DAN310	**ANIMAL_ANATOMY_310**				
NAS_VKU	n a	Bilingual	1 + 0.5	S1	8
Functional anatomy, growth and development of tissues and organ systems. Changes during maturation, reproduction, the post-partum period and lactation. Ageing and tissue changes with erosion diseases. The influence of hormones, production and					

reproduction on conformation and a critical evaluation of assessment of animals for functional efficiency. **Prerequisite:** [DAF200]					
DFS311	**ANIMAL_PHYSIOLOGY_311**				
NAS_VKU	n a	Bilingual	2 + 0	S1	10
Homeostasis and Homeorhesis in animals: Thermoregulation. Adaptation of glucose, lipid and protein metabolism in response to short and long-term changes in the supply and balance of nutrients and to changes in tissue demand for nutrients during different physiological states. Deviations from normal homeostasis, metabolic diseases and the prevention thereof. Pathogenesis of inflammation and infections; immunity. **Prerequisite:** [DAF200]					
DFS320	**GROWTH_PHYSIOLOGY_320**				
NAS_VKU	n a	Bilingual	2 + 0.5	S2	10
The underlying physiological processes in growth and development. Pre- and post-natal growth and factors which determine growth rate: growth curves, stimulants of growth, age, nutrition, race, gender, et al. **Prerequisites:** [TDH]					
EKN110	**ECONOMICS_110**				
EB_EKN	n a	Bilingual	3 + 0	S1	10
Conceptualise the interrelationships of the different sectors in South African economy. The functioning of international trade, government economics and policy, the labour market, monetary economics, economic development, and environmental economics with specific reference to the South African context. The impact of national and international decisions and events on the South African economy.					
EKN113	**ECONOMICS_113**				
EB_unk	n a	Bilingual	3 + 0	S1	15
Introduction to economics and principles of microeconomics. The scope of economics; the basic theory of demand and supply; price, income and cross elasticity of demand; consumer utility, the utility function and case studies in terms of the utility function; the theory of the firm in the short and long run; market structures namely the perfect market, monopoly, oligopoly and monopolistic competition; public sector finances; microeconomics vs macroeconomics and economic statistics. **Prerequisite:** [Par 1.2]					
EKN120	**ECONOMICS_120**				
EB_EKN	n a	Bilingual	3 + 0	S2	10
The economic environment and problem: working and course of the South African economy; functioning and interrelationships of the different economic sectors. Macroeconomic theory and analysis. Analyse and interpret economic performance criteria: economic growth, inflation, job creation, balance of payments and exchange rate stability, income distribution. Calculate and interpret core economic indicators. Basic microeconomic principles: demand analysis (consumer theory); supply analysis (producer theory). Market analysis: market equilibrium; price determination; market forms; market failure; calculate and interpret price, income and cross elasticities. **Prerequisites:** [EKN110 GS or EKN113 GS] and [Par 1.2]					

EKN123	**ECONOMICS_123**				
EB_unk	n a	Bilingual	3 + 0	S2	15
National income and principles of macroeconomics. The mechanics of national income accounts, the Keynesian macroeconomic model, the money market, demand for money and money supply, money and credit creation and the role of the monetary authorities. The IS-LM model of macroeconomic equilibrium and monetary and fiscal policy applications; The aggregate demand and supply models with the debate between the classical school, the monetarists and the Keynesian school. The problems of inflation and unemployment. Macroeconomic issues namely: macroeconomic policy, international trade, the balance of payments and economic growth. **Prerequisites:** [EKN113 GS] and [Par 1.2]					
EKN214	**ECONOMICS_214**				
EB_EKN	n a	Bilingual	3 + 0	S1	16
Macroeconomics: From Wall and Bay Street to Diagonal Street – a thorough understanding of the mechanisms and theories explaining the workings of the economy is essential. Macroeconomic insight is provided on the real market, the money market, two market equilibrium, monetarism, growth theory, cyclical analysis, inflation, Keynesian general equilibrium analysis and fiscal and monetary policy issues. Mathematics for economics and econometric analysis of macroeconomic issues. **Prerequisites:** [EKN110 GS] and [EKN120 or EKN113 GS + EKN123 GS] and [EKN120 GS] and [STK110 GS]					
EKN215	**ECONOMICS_215**				
EB_EKN	n a	Bilingual	3 + 0	S1	16
Monetary economics: The role and elements of the financial system in the economy, economic description, functions, historic development, legal framework and asset and liability structures of financial institutions in South Africa. Financial instruments in the money market, financial instruments in the capital market, fixed interest securities market, variable interest securities market, stock market (shares), capital market instruments, foreign exchange market and instruments, futures market and contracts, options market and contracts. The meaning and functions of money, understanding interest rates, portfolio choice, the behaviour of interest rates, risk and term structure of interest rates, an economic analysis of the financial structure, multiple deposit creation and the money supply process, determinants of the money supply, the demand for money (different schools of thought) transmission mechanisms of monetary policy, money and inflation, theory of rational expectations and efficient capital markets, rational expectations and implications for policy. Global finance and the world economic environment, International Monetary System, Eurocurrency market and offshore banking, overview of the global financial markets, the current monetary policy framework and policy process in South Africa, possible future developments (including inflationary targets and modern central banking trends), bank regulation: the key role banks must play in the financial system and the basic reason for bank regulation and electronic banking. **Prerequisites:** [EKN110 GS] and [EKN120 or EKN113 GS + EKN123 GS] and [EKN120 GS] and [STK110 GS]					
EKN224	**ECONOMICS_224**				
EB_EKN	n a	Bilingual	3 + 0	S2	16
Microeconomics: Microeconomic insight is provided into: consumer and producer theory, general microeconomic equilibrium, Pareto-optimality and optimality of the price					

mechanism, welfare economics, market forms and the production structure of South Africa. Mathematics for economics and econometric analysis of microeconomic issues. **Prerequisites:** [EKN110 or EKN113] and [EKN214 GS] and [STK110]					
EKN310	**ECONOMICS_310**				
EB_EKN	n a	Bilingual	3 + 0	S1	20
Public finance: Role of government in the economy. Welfare economics and theory of optimality. Ways of correcting market failures. Government expenditure theories, models and programmes. Government revenue. Models on taxation, effects of taxation on the economy. Assessment of taxation from an optimality and efficiency point of view. South African perspective on public finance. **Prerequisites:** [EKN214] and [EKN224] and [STK120]					
EKN314	**ECONOMICS_314**				
EB_EKN	n a	Bilingual	3 + 0	S1	20
International trade/finance: International economic insight is provided into international economic relations and history, theory of international trade, international capital movements, international trade politics, economic and customs unions and other forms or regional co-operation and integration, international monetary relations, foreign exchange markets, exchange rate issues and the balance of payments, as well as open economy macroeconomic issues. **Prerequisites:** [EKN214] and [EKN224] and [STK120]					
EKN320	**ECONOMICS_320**				
EB_EKN	n a	Bilingual	3 + 0	S2	20
The identification, collection and interpretation process of relevant economic data; the national accounts (i.e. income and production accounts, the national financial account, the balance of payments and input-output tables); economic growth; inflation; employment, unemployment, wages, productivity and income distribution; business cycles; financial indicators; fiscal indicators; social indicators; international comparisons; relationships between economic time series - regression analysis; long-term future studies and scenario analysis; overall assessment of the South African economy over the period from 1960 onwards. **Prerequisite:** [EKN310 GS]					
EKN325	**ECONOMICS_325**				
EB_EKN	n a	Bilingual	3 + 0	S2	20
Economic development: *capita selecta*. Political economy: Several macroeconomic policy issues such as fiscal and monetary policy, international trade policy, labour policy and competition policy. Economic development is studied from the perspective of South Africa as a developing nation. Several *capita selecta* is covered with the focus on sustainability of development in the South African and regional context. **Prerequisites:** [EKN310 GS] and [EKN314 GS]					
EOT110	**ACADEMIC_LITERACY(1)_110**				
GW_EOT	EOT151, EOT152	Bilingual	2 + 0	S1	6
An introduction to academic literacy that considers various language learning styles and strategies, and provides an initial exploration of the characteristics of academic language. The course focuses initially on academic listening and speaking. Practice in					

collecting information for academic tasks, as well as in the processing of academic information. In addition, the module has a focus on the enhancement of academic vocabulary, and some initial and elementary academic writing is attempted.					
EOT120	**ACADEMIC_LITERACY(2)_120**				
GW_EOT	EOT153, EOT154	Bilingual	2 + 0	S2	6
While retaining an emphasis on the collection and processing of academic information, this module also provides sustained practice in academic reading. Similarly, we concentrate on building up an academic vocabulary specific to certain fields of study. The final part of the module brings together academic listening, reading and writing. The production of academic information in the form of argumentative writing is the focus here, i.e. we concentrate on producing academic discourse that is rational, coherent, clear and precise.					
EOT161	**ACADEMIC_READING_SKILLS_161**				
GW_EOT	n a	Bilingual	3 + 0	K1	6
Developing academic reading skills in English, including summarizing, vocabulary building and critical reading. *Not for students who are compelled to enroll for EOT110, EOT120.					
EOT162	**ACADEMIC_WRITING_SKILLS_162**				
GW_EOT	n a	Bilingual	3 + 0	K2	6
Developing academic reading skills in English, including structuring and sustaining arguments, and basic English grammatical and editing skills.. *Not for students who are compelled to enroll for EOT110, EOT120.					
EOT164	**COMMUNIC._IN_ORGANISATIONS_164**				
GW_EOT	n a	English	3 + 0	K4	6
This module focuses on the role of language in organizations. Techniques for persuasion, finding information, conducting interviews, etc. are covered, as well as methods used in advertising and skills needed for public speaking. The criteria for drawing up a successful CV, for conducting meetings successfully, writing letters, agendas, minutes and reports are discussed and practiced. *Not for students who are compelled to enroll for EOT110, EOT120.					
ERG282	**ERGONOMICS_282**				
NAS_VBR	ERG110	Double	1 + 1	S1	8
Study of general ergonomic principles as applied to the design of workplaces, workspaces and ways of performing work. The interaction between the human (user) and his work, workspace (immediate surroundings) and the general environment (climate, lighting, and noise, etc.) serve as a point of reference.					
EST121	**AESTHETICS_121**				
NAS_VBR	EST310	Double	1 + 1	S2	9
Presentation techniques: story boards and technical drawings. Presentation techniques using CAD. **Prerequisite:** [OBG111]					
EST212	**AESTHETICS:PRODUC.CONS.&EN.212**				
NAS_VBR	EST211	Double	1 + 1	S1	10
Introduction to aesthetics: framework of approach; physical as premise; role of clothing					

and clothing environments; perceptual process; factors that influence evaluation. Aesthetics of the product: Design elements in clothing products; visual, tactile, audio and olfactory elements; complexity, order, novelty. Aesthetics of the consumer: figure analysis; colour; design elements: clothing product and figure. Aesthetics of the environment: visual presentation in clothing environments. **Prerequisite:** [EST121]					
FAR381	**PHARMACOLOGY_381**				
MED_FAR	n a	Double	2 + 0	S1	20
Introduction, receptors, antagonism, kinetic principles, the autonomic nervous system, pharmacotherapy of hypertension, angina pectoris, myocardial infarction, heart failure, arrhythmias, and epilepsy. Diuretics, glucocorticosteroids, local anaesthetics, anaesthetic drugs, analgesics, iron and vitamins, oncostatics and immuno suppressants.					
FAR382	**PHARMACOLOGY_382**				
MED_FAR	n a	Double	2 + 0	S2	15
Hormones, drugs that act on the histaminergic, serotonergic, and dopaminergic receptors. Pharmacotherapy of diabetes mellitus, schizophrenia, depression, obesity, anxiety, insomnia, gastro-intestinal diseases. Anticoagulants, antimicrobial drugs.					
FBS110	**FINANCIAL_MANAGEMENT_110**				
EB_RFB	n a	Bilingual	3 + 0	S1	10
Purpose and functioning of financial management. Basic financial management concepts. Accounting concepts and the use of the basic accounting equation to describe the financial position of a business. Recording of financial transactions. Relationship between cash and accounting profit. Internal control and the management of cash. Debtors and short-term investments. Stock valuation models. Depreciation. Financial statements of a business. Distinguishing characteristics of the different forms of business. Overview of financial markets and the role of financial institutions. Risk and return characteristics of various financial instruments. Issuing ordinary shares and debt instruments. **Prerequisite:** [Par 1.2]					
FBS120	**FINANCIAL_MANAGEMENT_120**				
EB_RFB	n a	Bilingual	3 + 0	S2	10
Analysis of financial statements. Budgeting and budgetary control. Tax principles and normal income tax for individuals. Time value of money and its use for financial and investment decisions. Calculating the cost of capital and the financing of a business to maintain the optimal capital structure. Capital investment decisions and a study of the financial selection criteria in the evaluation of capital investment projects. The dividend decision and an overview of financial risk management. **Prerequisite:** [Par 1.2]					
FBS210	**FINANCIAL_MANAGEMENT_210**				
EB_RFB	n a	Bilingual	3 + 0	S1	16
Framework and purpose of financial management; understanding financial statements; analysis of financial statements for decision making; time value of money; risk and return relationships; business valuation; short-term planning; current asset management; long-term financing decisions.					

FBS220	FINANCIAL_MANAGEMENT_220				
EB_RFB	n a	Bilingual	3 + 0	S2	16
The purpose and functioning of management accounting, cost classification; the determination of product costs including raw material costs, labour costs, overheads and its allocation according to traditional and activity-based costing methods, inventory management, the accumulation of costs according to job and process costing systems, the treatment of joint and by-products and the determination of costs according to a direct and absorption costing approach; decision-making with reference to cost-volume-profit ratios, relevant costs, risk and uncertainty.					
FCL400	**FACILITATING_LEARNING_400**				
OPV_KS	n a	Bilingual		J1	24
Conceptualising changes in education and demonstrating change in education practice. Personal development through reflection. Studying the philosophy and principles of facilitating learning. Explore outcome based education system. Redefine existing teaching strategies in context of the learning paradigm. Designing and operationalising learning tasks for learners. Creating and managing a learning environment in which learners can construct and share meaning. Understand the importance of collaboration, team teaching and networking. Develop an integrated approach supported by ICT pertaining to the seven roles of the teacher.					
FIL155	**SCIENCE_AND_WORLD_VIEWS_155**				
GW_FIL	n a	Double	1 + 0	K1	6
Role played by mathematics and observation (experiment). Induction and falsification. Causality and determinism. Scientific revolutions: theory of relativity, quantum and evolution theory. Brain and consciousness. How is ethics possible? Euthanasia and abortion.					
FIL254	**PHILOSOPHY_OF_SCIENCE_254**				
GW_FIL	n a	Bilingual	2 + 0	K4	10
Cause and effect in science. Determinism. Induction and falsification. Positivism. The human sciences. Revolutionary changes: theory of relativity, quantum theory, theory of evolution and chaos/complexity theory. Artificial intelligence. Cosmology: origin of the universe and extraterrestrial life.					
FLG211	**INTRODUCTORY_&_NEUROPHYS.211**				
MED_FLG	n a	Double	2 + 1	S1	16
Orientation in physiology, homeostasis, cells, tissues, muscle, neurophysiology and the special senses. **Prerequisites:** [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]					
FLG212	**CIRCULATORY_PHYSIOLOGY_212**				
MED_FLG	n a	Bilingual	2 + 1	S1	16
Body fluids; haematology; cardiovascular physiology and the lymphatic system. **Prerequisites:** [CMY117] and [CMY127] and [MLB111] and [PHY171 or PHY131]					
FLG221	**LUNG/RENAL_PHYS,ACID/TEMP._221**				
MED_FLG	n a	Bilingual	2 + 1	S2	16
Structure, gas exchange and secretory function of the lungs, structure, excretory and					

non-urinary function of the kidneys; acid-base balance as well as the skin and body temperature control. **Prerequisites:** [FLG211] and [FLG212]					
FLG222	**DIGEST.,ENDOCR.&_REPROD/SYS.222**				
MED_FLG	n a	Bilingual	2 + 1	S2	16
Nutrition, digestion and metabolism; hormonal control of the body functions and the reproductive systems. **Prerequisites:** [FLG211] and [FLG212]					
FLG311	**APPL.CELLULAR_PHYSIOLOGY_311**				
MED_FLG	n a	Bilingual	1 + 1	S1	14
Study of cell morphology, functions of the cell organelles, synthesis of the various membrane en cytoskeleton proteins, activation of proteins through phosphorylation which is controlled by signal transduction mechanisms, processes involved in controlling cell numbers, background for cell based experiments and research. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG312	**DEVELOPMENTAL_PHYSIOLOGY_312**				
MED_FLG	n a	Bilingual	1 + 0	S1	9
Study oF the physiological development and adaptations from the foetus to old age. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG313	**RESEARCH_METH.&_LIT.STUDY_313**				
MED_FLG	n a	Bilingual	1 + 1	S1	14
Research methodology, career planning, subject orientated literature studies and seminars. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG314	**IMMUNOLOGY_314**				
MED_FLG	FLG321	Double	1 + 0	S1	9
Introduction to basic, applied and integrated immunological mechanisms. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG322	**INDUSTRIAL_PHYSIOLOGY_322**				
MED_FLG	n a	Bilingual	1 + 1	S2	14
Problem-orientated module, with the emphasis on occupational health and safety in the industrial environment. Integration of different physiological systems. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					

FLG324	**EXERCISE_PHYSIOLOGY_324**				
MED_FLG	n a	Bilingual	1 + 1	S2	14
Mechanisms of muscle contraction and energy sources. Cardio-respiratory changes, thermoregulation and other adjustments during exercise. Use and abuse of substances to improve performance. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG325	**NUTRITION_PHYSIOLOGY_325**				
MED_FLG	n a	Bilingual	1 + 0	S2	9
The importance of nutrients and micro-nutrients in the composition of a normal diet; the neuro-endocrine control of food intake and special aspects of immunology of the digestive tract. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG327	**HIGHER_NEUROLOGICAL_FUNCT.327**				
MED_FLG	n a	Double	0 + 2	S2	20
Tutorials and seminars on higher functions of the brain and interaction between the neurological, endocrine and immune systems. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG328	**PATHOPHYSIOLOGY_328**				
MED_FLG	n a	Double	1 + 0	S2	9
Human pathophysiology. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FLG329	**INTEGRATED_HUMAN_PHYSIOL._329**				
MED_FLG	n a	Bilingual	0 + 1	S2	9
Integration of all the human physiological systems. **Prerequisites:** [BCM255 GS + BCM256 GS] and [BCM263 GS + BCM264 GS] and [BCM265 GS + BCM266 GS] and [BCM253 GS + BCM254 GS] and [FLG221] and [FLG222]					
FOE400	**FOUNDATIONS_OF_EDUCATION_400**				
OPV_KS	n a	Bilingual		J1	6
Exploration of theories and philosophies of learning and pedagogical knowledge impacting on change in education. Issues impacting on education related to decision making in the classroom: school system, interpretation of policy documents and programme studies.					
FPP451	**CHEM/MICROBIOL_ASPEC/FOOD_451**				
NAS_VDW	VOV483	English	2 + 1	S1	20
Chemical aspects: The role and composition of the major chemical components of food					

(water, carbohydrates, proteins and lipids). The content and nutritional role of different minor chemical components of food (minerals and vitamins). The principles and control of enzymic and non-enzymic browning. The composition and use of enzymes in food processing. Microbiological aspects: Introduction to micro-organisms. Intrinsic and extrinsic factors that affect growth and survival of micro-organisms. Important microbial groups in food. Microbial spoilage of foods. Determination of micro-organisms and/or their products in foods. The preservation of foods. Microbial indicators of food safety and quality. Food borne diseases and intoxications. The utilisation of micro-organisms in food production. **Prerequisite:** [Third-year status or TDH]

FPP452	**FOOD_PROC.EQUIP/OPERATIONS_452**				
NAS_VDW	VOV485	English	3 + 0.5	S1	20
(Also includes: 1 discussion class per week) Dimensions and units. Introduction to mass and energy balance. Heat transfer theory, Energy for food processing, Fluid flow and rheology, unit operations including: materials handling, cleaning, sorting and grading, peeling, disintegration, separation, pumping, mixing and forming, heating, concentration, drying, extrusion, cooling. **Prerequisite:** [Third-year status or TDH]					
FPP461	**APPRO.FOOD_PRES.VATION_TECH461**				
NAS_VDW	n a	English	2 + 0.5	S2	20
Food security. Post-harvest losses (biochemical spoilage, chemical spoilage, physical spoilage, physiological spoilage, microbial spoilage, insects and rodents). Post-harvest handling of food (storage, transport and packaging). Appropriate processing and preservation technologies (drying, fermentation, chemical preservation, heat treatment, hurdle technology, milling). **Prerequisites:** [FPP451 GS] and [FPP452 GS] or [TDH]					
FPP462	**APPRO.FOOD_PROCES._TECHNO._462**				
NAS_VDW	VOV483	English	2 + 0.5	S2	20
Cereals (milling, fermentation, baking). Oilseeds and legumes (extraction, refining, bleaching, hydrogenation). Fruits and vegetables (drying, canning, pickling). Dairy (fermentation, concentration). Meat (fermentation, drying, canning, smoking and curing). **Prerequisites:** [FPP451 GS] and [FPP452 GS] or [TDH]					
FPP463	**PROJECT_463**				
NAS_VDW	VOV472	English	2 + 0.5	S2	20
Exercise in beneficiating a locally produced agricultural raw material into an added-value food product with an extended shelf life; applying food preservation and processing principles, performing a mass-energy balance and costing of the process. **Prerequisites:** [FPP451 GS] and [FPP452 GS] or [TDH]					
FRK111	**FINANCIAL_ACCOUNTING_111**				
EB_FRK	n a	Bilingual	4 + 0	S1	10
The nature and function of Accounting; the development of Accounting; financial position; financial result; the recording process; processing of Accounting data; elementary income statement and balance sheet; flow of documents; accounting systems; introduction to internal control and internal measures; bank reconciliations; control accounts; adjustments; financial statements of a sole proprietorship. **Prerequisite:** [Par.1.2]					

FRK121	FINANCIAL_ACCOUNTING_121				
EB_FRK	n a	Bilingual	4 + 0	S2	12
Elements of financial statements in detail. The conceptual framework. Income statement, balance sheet, cash flow statement and analysis and interpretation of clubs, partnerships close corporations. Introduction to companies. **Prerequisite:** [FRK111 GS]					
FSG110	**PHYSIOLOGY_110**				
MED_FLG	n a	Double	3 + 0	S1	6
Introduction to the study of physiology; chemical principles; cells and tissues; neurophysiology; haematology and defence systems; cardiovascular physiology.					
FSG120	**PHYSIOLOGY_120**				
MED_FLG	n a	Double	3 + 0	S2	6
Respiratory system; endocrinology; kidney physiology; acid-base equilibrium; digestion; metabolism; reproductive system; temperature regulation. **Prerequisite:** [FSG110 GS]					
FST250	**INTRO/FOOD_SCIENCE_&_TECH._250**				
NAS_VDW	VDW211	English	2 + 1	S1	12
Lectures: Food Science as a discipline. Activities of Food Scientists and Nutritionists. How food is produced, processed and distributed (food pipeline). World food problem. Human nutrition and human food requirements. Constituents of foods. Functional properties. Functional properties. Food quality. Food deterioration and control (food preservation). Unit operations in food processing. Food safety, risks and hazards. Selected food industries. Principles of food packaging. Food legislation and labelling. Food processing and the environment. Practicals: Group assignments applying the theory in practice; practical demonstrations in pilot plants; guest lecturers on the world of food scientists and nutritionists; factory visit/videos of food processing. **Prerequisites:** [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]					
FST260	**PRIN/FOOD_PROC._&_PRESERV._260**				
NAS_VDW	VDW222	English	2 + 1	S2	12
Lectures: Food preservation technologies: concept of hurdle technology; heat (blanching, pasteurisation and sterilisation); cold (refrigeration and freezing); concentration and dehydration; food irradiation; fermentation; preservatives; new methods of food preservation. Effect of various food preservation technologies on the microbiological (shelf-life and safety issues), sensory and nutritional quality of foods. Practicals: Practical applications of above processes. Physical, chemical and sensory evaluation of processed foods. Assignment: Application of hurdle technology concept to a specific food product. **Prerequisites:** [CMY117] and [CMY127] and [MBY161] and [PHY131] and [WTW134] or [TDH]					
FST350	**INTEGRATED_FOOD_SCIENCE_350**				
NAS_VDW	VDW400	English	2 + 0	J1	18
Literature studies and seminar presentations on topics in Food Science, Nutrition and Health. **Prerequisites:** [FST250] and [FST260] and [Second-year status] or [TDH]					

FST351	FOOD_CHEMISTRY-(1)_351				
NAS_VDW	VDW314	English	2 + 1	S1	18
Lectures - Chemistry of major food components: Carbohydrates. Proteins. Lipids. Water. Chemical and nutritional aspects of food processing: implications of different processing techniques on the major food components. Functional properties of the major food components. Modification of functional properties of the major food components. Food analysis methodology. Practical work: Food analysis. **Prerequisites:** [BCM255 + BCM256] and [BCM263 + BCM264] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254]					
FST352	**FOOD_CHEMISTRY-(2)_352**				
NAS_VDW	VDW324	English	2 + 1	S1	18
Lectures - Basic Food Analysis and Chemistry of the Minor Food Components: Basic food analysis, vitamins, minerals, additives, contaminants. Chemical and nutritional aspects of food processing: implications of different processing techniques on minor food components). Functional properties of the minor food components. Food analysis methodology. Practical work: Food analysis. **Prerequisites:** [BCM255 + BCM256] of [TDH] and [BCM263 + BCM264] of [TDH] and [BCM265 + BCM266] of [TDH] and [BCM253 + BCM254] of [TDH]					
FST353	**FOOD_ENGINEERING_353**				
NAS_VDW	LPR311,312	English	3 + 0.5	S1	18
Lectures- Mass and energy balance. Heat transfer theory: Convection, conduction and radiation. Energy for food processing. Fluid flow and rheology. Unit operations: materials handling, cleaning, sorting, grading, peeling, disintegration, separation (e.g. membrane technology), pumping, mixing and forming, heating, concentration, drying, extrusion, refrigeration, freezing. Tutorials/practicals - Calculations on mass and energy balances, psychometry, refrigeration and freezing. **Prerequisite:** [FST260] or [TDH]					
FST360	**PRINC_SCI_&TECH_PLANT_FOOD_360**				
NAS_VDW	n a	English	2 + 1	S2	18
Cereal and legume grains, oilseeds and fruits and vegetables: Composition and structure. Quality assessment and grading. Post-harvest storage and physiology. Cleaning and sorting principles and technologies. Milling – principles and technologies, and their effects on product functionality and nutrient composition. Juice and oil extraction – principles and technologies, and their effects on product functionality and nutrient composition. Bread and baked goods making – principles and technologies, and their effects on product functionality and nutrient composition. Practical work: Laboratory analyses of components and products of cereals, oilseeds, legumes and fruits and vegetables; Determination of quality; Factory visits. **Prerequisites:** [FST250] and [FST260] and [FST351] and [FST352] or [TDH]					
FST361	**ANIMAL_FOOD_SCIENCE_361**				
NAS_VDW	n a	English	2 + 1	S2	18
Dairy science: Composition of milk; some physical properties of milk; factors affecting composition of milk; microbiological aspects of milk production; lactation; mechanical milking; milk defects; nutritive value of milk and milk products. Practical work: Chemical and microbiological tests of milk. Demonstration of the cheese-making process. Meat, poultry, fish and egg science: The composition, nutritional value and quality of meat,					

poultry, fish and eggs; factors affecting quality from slaughter or harvesting to consumption. Practical work: Visits to red meat and poultry abattoirs; quality determinations, egg quality and protein functionality. **Prerequisites:** [FST250] and [FST260] and [FST351] and [FST352] or [TDH]					
FST400	**RESEARCH_METHODOLOGY_&_SEM.400**				
NAS_VDW	FST453	English	2 + 1	J1	20
Lectures and assignments: Research methodology. Literature study and seminar presentations on topics in Food Science and/or Technology. The candidate must also pass an oral examination at the end of the module. **Prerequisite:** [Third-year status] or [TDH]					
FST401	**ANIMAL_FOOD_TECHNOLOGY_401**				
NAS_VDW	FST452	English	2 + 1	J1	20
Dairy technology: The technology of fluid, concentrated, dried, frozen and fermented dairy products and starter cultures. Requirements for milk supply and other ingredients. Principles for the manufacturing of products in this category. Possible defects, causes and prevention. Practical work: Preparation of condensed milk, custard, ready-to-eat milk-based desserts, flavoured milk beverages, dairy-fruit juice mixtures; ice cream and other frozen desserts; yoghurt and cultured milk products; cheeses. Evaluation and analysis of the products. Effect of processing on nutritional value of dairy products. Factory visits. Meat, poultry, fish and egg technology: Meat, poultry, fish and egg processing and equipment. Meat emulsion, curing, dehydration and fermentation technology. Preservation and storage. Packaging. Legislation. Quality control and hygiene. Effect of processing on nutritional value of meat products. Practical work: Manufacturing of dried, cured, fermented and emulsion type products. Visits to processing factories. **Prerequisite:** [FST361] or [TDH]					
FST402	**ADV_PLANT_FOOD_SCI_&_TECHN_402**				
NAS_VDW	FST462	English	2 + 1	J1	20
Plant food functionality: Starch, non-starch polysaccharides, protein. Advanced rheology and texture. Malting and brewing. Ready-to-eat (RTE) technologies and their impact on functional and nutritional quality. Plant oil processing. Minimal processing of fruits and vegetables. Practical work: Pasting properties of starch; Dough rheology; Isolation of legume and cereal proteins; SDS-PAGE electrophoreses of legume and cereal proteins; Malting and mashing of sorghum and barley malt; Extraction of essential oils; Extraction and identification of phenolic compounds; Minimal processing of fruits and vegetables. **Prerequisite:** [FST360] or [TDH]					
FST412	**SENSORY_ANALYSIS_412**				
NAS_VDW	n a	English	1 + 1	S1	10
Principles and applications of sensory evaluation. Types of panels, tests and test conditions and their functions. Selection and training of panellists for descriptive sensory evaluation. Instrumental sensory quality measurements. Statistical analysis and interpretation of data. Practicals: Practical aspects and execution of sensory evaluation techniques, analysis and interpretation of data. Instrumental sensory quality measurements. **Prerequisites:** [FST260] and [FST351] and [FST352] or [TDH]					

FST413	PRODUCT_DEV.&_QUALITY_MAN._413				
NAS_VDW	VDW442, FST461, FST410	English	3 + 1	S1	30
Lectures: Principles involved and steps that are followed to develop new food products that are safe, tasty, nutritious and cost effective. Application of the theory of food product development. Quality management systems with specific reference to Good Manufacturing Practices, HACCP and ISO 9000. National and international standards, Codex Alimentarius, FDA. Application of food legislation. Food Packaging. Practicals: A product development project will be planned, conducted and presented. Application and implementation of HACCP. **Prerequisites:** [FST260] or [TDH] and [FST351] and [FST352]					
FST414	**RESEARCH_METHODOLOGY_414**				
NAS_VDW	Cap Sel FST 400	English	3 day + full-time	S1	8
Three-day intensive Research Methodology Workshop: Philosophy of research; Where to start research - Problem statement; Role and importance of the literature review; How to formulate hypotheses and objectives; Experimental design; The good practical way to do research, including getting the results down; Application of Statistics to research; Writing an honours report/masters dissertation/doctoral thesis; Writing a scientific paper; Preparing and presenting posters and oral papers. **Prerequisite:** [Third-year status] or [TDH]					
FST420	**ADVANCED_FOOD_SCIENCE_420**				
NAS_VDW	FST451	English	2 + 0	J1	20
Discusion classes in advanced level food chemistry, food microbiology, food engineering, food processing and nutrition. Problem solving and literature discussion. **Prerequisite:** [Third-year status] or [TDH]					
FST463	**RESEARCH_PROJECT_463**				
NAS_VDW	n a	English	0 + 1	J1	40
Planning, execution and reporting of a research project on a selected Food Science and/or Technology subject. **Prerequisite:** [Third-year status in Food Science or TDH]					
GGY132	**CARTOGRAPHIC_SKILLS_132**				
NAS_GGY	n a	Bilingual	0 + 1	S1	4
Principles of cartography. Map reading, analysis and interpretation; introductory survey techniques.					
GGY156	**INTRO.TO_HUMAN_GEOGRAPHY_156**				
NAS_GGY	n a	English	4 + 0	K2	6
Foundations for understanding contemporary human geographic processes. The module will trace the major changes in the economic, political and population geography of Southern Africa and beyond.					
GGY157	**INTRO.TO_ENVIRONM.SCIENCES_157**				
NAS_GGY	n a	English	4 + 0	K1	6
Introducing the basic concepts and interrelationships required to understand the complexity of natural environmental problems, physical and human environment,					

human induced environmental problems, the ways in which the natural environment affects human society and biodiversity, an introduction to major environmental issues in southern Africa and sustainable development in the context of environmental issues.					
GGY162	**REMOTE_SENSING_162**				
NAS_GGY	n a	English	0 + 1	S2	4
Use, interpretation and analysis of satellite imagery, aerial photography and other remotely sensed data.					
GGY166	**SA_&_GLOBAL_GEOMORPHOLOGY_166**				
NAS_GGY	n a	English	4 + 0	K3	6
Investigating southern African landscapes and placing them in a global context. Introduction to the concepts of Physical Geography and its relationships to other physical sciences (climatology, geology, hydrology, biology). The interaction of landscaping processes and controls thereon, contemporary geomorphological dynamics and vulnerability of landforms and landscapes. The geomorphological evolution of southern Africa, in a global context.					
GGY252	**PROCESS_GEOMORPHOLOGY_252**				
NAS_GGY	n a	English	4 + 2	K2	12
Physical processes that influence the earth's surface and management. Specific processes and their interaction in themes such as weathering; soil erosion; slope, mass movement and fluvial processes.					
GGY263	**URBAN_MODELLING_263**				
NAS_GGY	n a	English	4 + 2	K3	12
The utility of existing models for urban planning for cities in developing countries, and the challenges presented by urban realities will be examined using empirical case studies of cities and planning in Africa. Themes discussed include urban agriculture, peri-urban settlement, tenure insecurity, and the importance of the informal economy. In light of the realities of the aforementioned factors, the development of new, more appropriate urban models will be considered.					
GGY264	**URBAN_SOCIAL_MORPHOLOGY_264**				
NAS_GGY	n a	English	4 + 2	K4	12
The structure and spatial distribution of class, income, ethnicity, age and other demographic variables in urban environments in South Africa and other parts of the world. Qualitative and quantitative analyses of social change and transformation in cities, including segregation, desegregation and gentrification. Other themes include urban perception, urban living, social area analysis, and spatial strategies for social integration.					
GGY283	**INTRODUCTORY_GIS_283**				
NAS_GGY	n a	English	2 + 1	S1	12
Introduction to Geographic Information Systems (GIS), theoretical concepts and applications of GIS. The focus will be on the GIS process of data input, data analysis, data output and associated technologies. Note: The content of this module is the same as GIS 221 and students are not allowed to earn credits for both GGY 283 and GIS 221. Note: This is a closed module, only available to students studying [BT&RP] (12132022), [BSc(Arch)] (12132002), [BSc(LArch)] (12132004), BSc Meteorology (02133312), BSc Geoinformatics (02133383), BSc Environmental Science (02133361),					

BSc Earth Sciences (02133012), BSc Geography (02133385) or as approved by the Head of Department.					
GGY354	**DEVELOPMENT_GEOGRAPHY_354**				
NAS_GGY	n a	English	4 + 2	K1	18
Principles of development, perspectives on development. Aspects of development strategy such as population growth, urbanisation, rural development. Development in Third World cities. Frameworks for development in South Africa.					
GGY355	**HUMAN_ENVIRONM._INTERACT._355**				
NAS_GGY	n a	English	4 + 2	K2	18
Focus on contemporary environmental issues in southern Africa. Recent and future impacts of human pressures on natural resources, the state of the environment in South Africa, management of critical resources, population trends, biodiversity loss, pollution, water scarcity, desertification, climate change, waste accumulation and management, environmental management tools, environmental education and environmental management legislation.					
GGY361	**ENVIRONM.GEOMORPHOLOGY_361**				
NAS_GGY	n a	English	4 + 2	K3	18
Interactions of geomorphic processes within the physical and built environments; themes such as geomorphology and environmental change, slope processes and the environment, geomorphic risks and hazards, soil erosion and conservation, geomorphology in environmental management, weathering in urban environments, preservation of buildings, and deterioration and preservation of indigenous rock art. Practicals involve fieldwork and subsequent laboratory analysis, as well as modelling utilising modern computational techniques. NOTE: The content of this module is the same as GGY363 and students are not allowed to earn credits for both GGY361 and GGY363.					
GGY363	**APPLIED_GEOMORPHOLOGY_363**				
NAS_GGY	n a	English	4 + 0	K3	12
Interactions of geomorphic processes within the physical and built environments. Geomorphology in environmental management, weathering in urban environments, conservation and preservation of buildings. NOTE: The content of this module is the same as GGY361 and students are not allowed to earn credits for both GGY361 and GGY363.					
GGY364	**ENVIRONMENTAL_MODELLING_364**				
NAS_GGY	n a	English	4 + 2	K4	18
Theoretical approaches to model building and modelling in the environment, and their application to real world examples will be investigated with an emphasis on the geomorphology in a changing environment. Practical applications of the theory may include, amongst others: soil and hillslope hydrology, catchment hydrology, environmental change, fluvial processes and interactions, ecosystem variables, erosion and sediment transport, slope instability, landuse change, and socio-economic variables. Practical applications will utilise spatial modelling techniques in Geographic Information Systems, remote sensing and other expert computer modelling systems.					

GIS220	GEOGRAPHIC_DATA_ANALYSIS_220				
NAS_GGY	n a	English	3 + 1	S2	12
The nature of Geographical data and measurement. Probability, probability distributions and densities, expected values and variances, Central Limit theorem. Sampling techniques. Exploratory data analysis, descriptive statistics, statistical estimation, hypothesis testing, correlation analysis and regression analysis.					
GIS221	**GIS_INTRODUCTION_221**				
NAS_GGY	n a	English	2 + 1	S2	12
Introduction to Geographic Information Systems (GIS), theoretical concepts and applications of GIS. The focus will be on the GIS process of data input, data analysis, data output and associated technologies. NOTE: The content of this module is the same as GGY283 and students are not allowed to earn credits for both GGY283 and GIS221.					
GIS310	**GEOGRAPHIC_INFORMATION_SYS.310**				
NAS_GGY	n a	English	3 + 1	S1	24
Advanced theory and practice of Geographic Information Systems; GIS applications; design and implementation of GIS applications. **Prerequisite:** [GGY283] or [TDH]					
GIS320	**SPATIAL_ANALYSIS_320**				
NAS_GGY	n a	English	3 + 1	S2	24
Construction of Raster Geovisualisations, Spatial Model construction and use, Multi Criteria Decision Analysis. Factor Analysis: Principle component analysis. Geostatistics: Spatial Dependence modeling, Ordinary Kriging. Markov Chains and Cellular Automata, combined models. **Prerequisite:** [GIS310] or [TDH]					
GKD250	**INTRODUCTORY_SOIL_SCIENCE_250**				
NAS_PGW	GKD213	Bilingual	3 + 1	S1	12
Origin and development of soil, weathering and soil formation processes. Profile differentiation and morphology. Physical characteristics: texture, structure, soil water, atmosphere and temperature. Chemical characteristics: clay minerals, ion exchange, pH, buffer action, soil acidification and salinisation of soil. Soil fertility and fertilisation. Soil classification. Practical work: Laboratory evaluation of simple soil characteristics. Field practicals on soil formation in the Pretoria area. **Prerequisite:** [CMY117 GS] or [TDH]					
GKD260	**SOIL_FERTIL.&_PLANT_NUTRIT.260**				
NAS_PGW	GKD228	Bilingual	3 + 1	S2	12
Principles of plant nutrition. Essential plant nutrient elements. Soil as growth medium for plants. Macro and micro element supply to plants. Micro elements. Deficiencies and toxicities. Evaluation of soil fertility. Practical work: Laboratory evaluation of soil fertility. Pot experiments in glass house. **Prerequisite:** [GKD250 GS]					
GKD320	**SOIL_CHEMISTRY_320**				
NAS_PGW	GKD215	Bilingual	2 + 1	S2	14
The more exact chemistry of soils systematically explained by understanding the					

particular chemical principles. Charge origin. Chemical equilibriums. Manifestations of sorption. Ion exchange. In depth study of acidic soils, saline soils and the organic fraction of soil. The chemistry of the important plant nutrient elements P, K and N is explained. **Prerequisite:** [GKD250]					
GKD350	**SOIL_CLASSIF.&_SURVEYING_350**				
NAS_PGW	GKD317	Bilingual	2 + 1	S1	14
A taxonomic system for South Africa. USDA's Soil Taxonomy. Land suitability evaluation. Optimal resource utilization. The conservation component. Ecological aspects. Ecotype, land types. Soil maps. Practical work: Field practicals and compulsory excursion. Identification of soil horizons, forms and families. Land suitability evaluation. Elementary mapping exercise. **Prerequisite:** [GKD250 GS]					
GKD351	**SOIL_PHYSICS_351**				
NAS_PGW	GKD329	Bilingual	1 + 0.5	S1	10
A study of some soil physical properties of soil: structure, texture, compacting and crusting. Sedimentation and sieve analyses for the determination of particle sizes. Conduction of heat. Practical work: Determination of some physical properties of soil. **Prerequisite:** [GKD250]					
GKD460	**ENVIRONMENTAL_MANAGEMENT_460**				
NAS_PGW	PGW411+GKD414	Bilingual	4 + 1	S2	26
Chemical, physical and biological soil degradation (with the emphasis on pollution): types, causes, effects and combating. Biogeochemical element cycles. Sewage sludge, Acid rain. Pesticides. Aspects of soil erosion. Integrated environmental management. Environmental impact studies as well as planning, implementation and auditing of environmental management plans. Strip and open cast mining. Catchment's studies and management of catchments, desertification, control of invasive exotics, bush encroachment and pollution of air and water. Environmental legislation Practical work: Studies on the aspects of lectures. **Prerequisites:** [GKD250] and [GKD350]					
GKD461	**SOIL_MINEROL.&SOIL_GENESIS_461**				
NAS_PGW	GKD415	Bilingual	2 + 1	S2	14
Pedogenetic processes. Soil forming factors. Clay mineralogy: structure, nomenclature, classification and synthesis of clay minerals.					
GLY151	**INTRODUCTORY_GEOLOGY_151**				
NAS_GLY	GLY112	English	4 + 1	K1	8
Solar system; structure of solid matter; minerals and rocks; introduction to symmetry and crystallography; important minerals and solid solutions; rock cycle; classification of rocks. Crystal models, mineral and rock samples. **Prerequisite:** [Par 1.2]					
GLY152	**PHYSICAL_GEOLOGY_152**				
NAS_GLY	GLY113	English	4 + 1	K2	8
External geological processes (gravity, water, wind, sea, ice) and their products (including geomorphology). Internal structure of the earth. The dynamic earth – volcanism, earthquakes, mountain building – the theory of plate tectonics. Geological					

processes (magmatism, metamorphism, sedimentology, structural geology) in a plate tectonic context. Geological maps and rock specimens.
Prerequisite: [Par 1.2]

GLY161	**HISTORICAL_GEOLOGY_161**				
NAS_GLY	GLY123	English	4 + 1	K4	8

Principles of stratigraphy and stratigraphic nomenclature; geological dating and international and SA time scales; Africa framework and tectonic elements of SA; introduction to depositional environments. Overview of the historical geology of SA, from the Archaean to the present: major stratigraphic units, intrusions and tectonic-metamorphic events - their rock types, fossil contents, genesis and economic commodities. Principles of palaeontology and short description of major fossil groups: fossil forms, ecology and geological meaning. Geological maps and profiles; rock samples.
Prerequisite: [Par 1.2]

GLY162	**ENVIRONMENTAL_GEOLOGY_162**				
NAS_GLY	n a	English	4 + 1	K3	8

Geological processes and their influence on man's environment: earthquakes, volcanoes, slope movement, subsidence, floods, coastal processes, meteorite impacts, atmospheric changes. Natural resource utilization and the impact of man on the geological environment: urban development, dams, mining, agriculture, transport systems, heavy structures, construction materials, groundwater extraction, waste disposal, environmental pollution. Geological maps, profiles and rock specimens, fossil specimens.
Prerequisite: [Par 1.2]

GLY251	**CRYSTAL_OPTICS_&_CRYS.CHEM.251**				
NAS_GLY	GLY214	English	4 + 2	K1	12

The properties of light in isotropic and anisotropic solids; the polarizing microscope; nature and identification of isotropic, uniaxial and biaxial crystals in transmitted and reflected light. Atoms and atomic structure; crystal structure and crystal field theory.
Prerequisites: [CMY117 GS] and [GLY151 and 2 of GLY152, GLY161, GLY162.]

GLY252	**MINERALOGY_252**				
NAS_GLY	n a	English	4 + 2	K2	12

Phase rule of Willard Gibbs. Phase diagrams in pressure-temperature-compositional space. One and two component systems. Systematic review of the major rock-forming silicate, sulphide and oxide minerals in terms of optical properties, crystal structure, crystal chemistry, pressure-temperature conditions of formation, alteration and association in rock systems. Optical identification and description of minerals and their mutual relationships in thin section.
Prerequisite: [GLY251 GS] of [TDH]

GLY253	**SEDIMENTOLOGY_253**				
NAS_GLY	GLY215	English	4 + 2	K2	12

Introduction to sedimentology; grain studies; composition and textures of sedimentary rocks; flow dynamics and behaviour of sediment particles in transport systems; description and genesis of sedimentary structures; diagenesis; depositional environments and their deposits, modern and ancient; chemical sedimentary rocks; economic sedimentology; field data acquisition from sedimentary rocks and writing of

reports; sieve analysis; Markov analysis; analysis of palaeocurrent trends; interpretation of sedimentary profiles. **Prerequisite:** [3 of GLY151, GLY152, GLY161, GLY162.]					
GLY254	**STRUCTURAL_GEOLOGY_254**				
NAS_GLY	GLY216	English	4 + 2	K1	12
Integrated theoretical and practical course dealing with the principles of rock deformation and analysis of deformed rocks. Stress, strain and rheology; fault systems, reactivation of faults, inversion tectonics, balanced cross sections; folds, interference (superposed) folds; tectonic fabrics; shear zones, progressive deformation; mapping and analysis of deformed rocks; regional tectonics. **Prerequisite:** [3 of GLY151, GLY152, GLY161, GLY162.]					
GLY261	**IGNEOUS_PETROLOGY_261**				
NAS_GLY	GLY316	English	4 + 2	K3	12
Classification and nomenclature of igneous rocks. The nature of silicate melts; physical and chemical factors influencing crystallisation and textures of igneous rocks. Phase diagrams, fractional crystallisation and partial melting. Trace elements and isotopes, and their use in petrogenetic studies. Global distribution of magmatism and its origin. Mid-oceanic ridges, active continental margins, intraplate magmatism. **Prerequisite:** [GLY252] or [TDH]					
GLY262	**METAMORPHIC_PETROLOGY_262**				
NAS_GLY	GLY316	English	4 + 2	K4	12
Classification of metamorphic rocks. Anatexis, migmatite and granite; eclogite. Metamorphic textures. PT-time loops. Metamorphism in various plate tectonic environments. **Prerequisite:** [GLY252] or [TDH]					
GLY264	**INTRODUCTION_TO_GEOPHYSICS_264**				
NAS_GLY	n a	English	4 + 2	K3	12
Physical properties of rocks and minerals relevant to exploration geophysics: porosity, and permeability; density; magnetic properties; natural radioactivity; elastic properties; seismic wave attenuation; thermal properties; electrical properties. Basic principles and applications of various geophysical techniques: gravity, magnetic, resistivity, electromagnetic, seismic and radiometric techniques. Mapping techniques. **Prerequisites:** [GLY151] and [GLY152] and [WTW114]					
GLY265	**GROUNDWATER_265**				
NAS_GLY	n a	English	4 + 2	K3	12
Origin and classification of groundwater; classification of aquifers; groundwater movement; equations for groundwater flow into boreholes; the La Place equation and solutions for pump tests; execution and interpretation of pump tests. Groundwater flow modelling; classification of aquifers in southern Africa; groundwater exploration and management. Compulsory attandance of 2nd year mapping camp and a mark of at least 50% for the accompanying report. **Prerequisite:** [GLY152] or [TDH]					
GLY352	**GEODYNAMICS_ORE_FORMATION_352**				
NAS_GLY	GLY323	English	4 + 2	K4	18
Principles of ore-forming processes and geological environments of ore formation; ore					

classification schemes: tectonic, temporal and structural controls on ore formation. Structural interpretation of ore deposits, and mapping techniques. **Prerequisite:** [GLY261]					
GLY361	**ORE_DEPOSITS_361**				
NAS_GLY	GLY323	English	4 + 2	K3	18
Systematic review of major metallic and non-metallic ore types and examples in South Africa and world-wide; ore type models (grades, tonnages); geometry of ore bodies; mining. Ore samples and ore mineralogy. Mapping techniques.					
GLY362	**GEOSTAT.&_ORE_RESERV._CALC.362**				
NAS_GLY	GLY323	English	4 + 2	K2	18
Review of classical geostatistical methods; problem evaluation; descriptive statistics, normal-, lognormal, three parameter lognormal distributions; confidence intervals; t-test. Sampling; cut-off values; grid generation and trend surface analysis. Semivariogram; error estimation; Kriging (BLUE) techniques. Ore reserve calculations. Compulsory attandance of 3rd year mapping camp and a mark of at least 50% for the accompanying report.					
GLY363	**ENGINEERING_GEOLOGY_363**				
NAS_GLY	GLY323	English	4 + 2	K1	18
Definition and scope of Engineering Geology; properties and use of rock material; rock mass classification; origin of soil; engineering properties and use of soils; stages of site investigation; general geotechnical properties of the typical soils and rocks on the Southern African subcontinent. **Prerequisites:** [GLY152] and [GLY265] or [TDH]					
GMA220	**REMOTE_SENSING_220**				
NAS_GGY	n a	English	3 + 1	S2	16
The electromagnetic spectrum, atmospheric and surface properties related to aerial photography. History of photogrammetry. Camera and film parameters, types of conventional and digital aerial photographs and their uses, photo mosaics, orthophotos. Flight plans and photo acquisition. Stereoscopic analysis, height measurements and mapping. Applications and interpretation of aerial photographs for a wide range of disciplines.					
GMA320	**REMOTE_SENSING_320**				
NAS_GGY	n a	English	3 + 1	S2	24
The electromagnetic spectrum, atmospheric and surface properties related to satellite imagery. History of satellite remote sensing. Orbit and sensor parameters, resolution types, satellite types and their uses, passive and active systems. Introductory digital image processing. Web sites and data acquisition. Applications and interpretation of satellite data for a wide range of disciplines.					
GMC110	**CARTOGRAPHY_110**				
NAS_GGY	n a	English	3 + 0	S1	8
The history of cartography, the shape of the earth and its portrayal on a flat surface, map design keeping the principles of design and map readers' perceptions in mind. Introduction to the principles of Geographic Information Systems (GIS), practical use of a GIS program to design and create a map. **Prerequisite:** [GGY132 #]					

GMC210	**CARTOGRAPHY_210**				
NAS_GGY	n a	English	3 + 1	S1	12
Information processing approaches to sight and visual cognition and the potential applications for cartographic representation, visual processing of maps, mental categories, knowledge structures and the understanding of maps, application of semiotics to cartography. **Prerequisite:** [GMC110]					
GMC310	**CARTOGRAPHY_310**				
NAS_GGY	n a	English	3 + 1	S1	24
Spherical Trigonometry, datum surfaces in Geodesy, calculations on the reference ellipsoid, projection principles, map distortion, construction of map projections, projection choice. Multi-variate mapping, dynamic mapping and functional representation. **Prerequisite:** [GMC210]					
GMT320	**PROJECT:_GEOMATICS_320**				
NAS_GGY	n a	Bilingual	3 + 1	S2	24
A project which is approved by the lecturer and in which one or more of the studied techniques of data acquisition and processing are used to produce an output of spatially referenced information. The project must be fully described in a project report. **Prerequisite:** [GIS310] or [TDH]					
GPE400	**GLOBAL_PERSPECTIVES_IN_EDU.400**				
OPV_KS	n a	Bilingual		J1	6
Dealing with future scenarios in education emerging from globalisation, world of work and contextual impact on education in South Africa. Interpreting the works of contemporary visionaries on the future education scenarios impacting on education in context of Africa. Creating management strategies in dealing with the age of technology, HIV/Aids, new social structures, gender and racial issues. (ClickUP)					
GTS161	**INTRODUCTORY_GENETICS_161**				
NAS_GTS	GTS122	Double	2 + 0.5	S2	8
Principles of Mendelian inheritance: concepts such as locus and allele, dominance interactions and epistasis. Introductory cytogenetics, the karyotype and cell division. Probability studies. Genetic linkage and chromosome mapping. Sex determination and sex linked traits. Inheritance of cytoplasmic DNA and cytoplasmic effects. **Prerequisite:** [MLB111 GS] or [TDH]					
GTS251	**GENE_&_CHROMOSOME_ORGANIZ._251**				
NAS_GTS	GTS215, GTS217	English	2 + 0.5	S1	12
Introduction to molecular genetics: Gene structure, transcription and translation, gene regulation, DNA replication, mutation, DNA repair and transposition. Extranuclear inheritance. The genetic basis of cancer and immunity. **Prerequisite:** [GTS161 GS] or [TDH]					
GTS261	**GENETIC_ANAL._&_MANIPULA._261**				
NAS_GTS	GTS215, GTS217	English	2 + 0.5	S2	12
Creation of variation in micro organisms: transformation, conjugation and transduction. Basic concepts of recombinant DNA technology and its applications in gene analysis					

and manipulation. Introduction to genetic analysis of populations: allele and genotypic frequencies, breeding systems and quantitative inheritance. **Prerequisite:** [GTS161 GS] or [TDH]					
GTS351	**EUKARYOTIC_GENE_CON.&_DEVL.351**				
NAS_GTS	GTS325	English	2 + 1	S1	18
Regulation of gene expression in eukaryotes: regulation at the genome, transcription, RNA processing and translation levels. Applications of the principles of gene control: cancer, development and differentiation of plants and animals. Aspects of the epigenetic control of gene expression. **Prerequisites:** [GTS251 GS] and [GTS261 GS] or [TDH]					
GTS352	**GENOMES_352**				
NAS_GTS	n a	English	2 + 1	S1	18
Analysis of the genome as central entity in molecular genetics. Comparison of the molecular organization of prokaryote and eukaryote genomes, nuclear and mitochondrial genomes. Genome organization in different organisms; gene families, overlapping genes, pseudogenes, DNA repeat content. Genetic techniques for genome mapping, physical mapping, genome sequencing and the localization of genes. Processing of DNA sequencing data using computer technology. Approaches for studying genome function. Functional genomics, transcriptomics and proteomics. Genome evolution. **Prerequisites:** [GTS251 GS] and [GTS261 GS] or [TDH]					
GTS353	**ADV._POPULATION_GENETICS_353**				
NAS_GTS	GTS326	English	2 + 1	S1	18
Genetic variation and mating systems. Allele frequency change: genetic drift, natural and kin selection, mutation and migration. Molecular evolution: nucleotide substitutions to multigene families, and the neutral theory. Quantitative genetics: analysis of genetic variation, heritability, natural selection and artificial selection of quantitative traits. Identification of quantitative trait loci (QTLs). **Prerequisites:** [GTS251 GS] and [GTS261 GS] or [TDH]					
GTS361	**HUMAN_GENETICS_361**				
NAS_GTS	GTS314	English	4 + 2	K3	18
Human karyotype. Pedigree analysis and the inheritance of single gene traits in humans, concepts such as X-chromosome inactivation, variable expressivity, penetrance, locus heterogeneity, genomic imprinting and mosaicism. Developmental genetics. Genetic differentiation of sex and sex chromosome abnormalities. Cytogenetic and molecular basis of genetic diseases. Linkage analysis and the identification of human disease genes. Genetics of the immune system. **Prerequisite:** [GTS352 GS] or [TDH]					
GTS363	**EVOLUTIO._&_PHYLO-GENETICS_363**				
NAS_GTS	n a	English	2 + 1	S2	18
Origin of life's code. Molecular evolution and analytical tools. Determining the molecular ecology and evolutionary history of populations and species, and its applications in conservation, medical sciences and human evolution. Optimality, phylogenetic and molecular studies of adaptation; Evolution of sexual reproduction, resistance and virulence, and its practical applications; Evolutionary arms races. **Prerequisite:** [GTS353 GS] or [TDH]					

GTS365	**APPLIED_MEDICAL_GENETICS_365**				
NAS_GTS	n a	English	4 + 2	K4	18
The clinical manifestations of common Mendelian diseases and cognenital anomalies; Risk assessment/calculation and genetic counselling; Genes and diseases - the use of polymorphisms, gene mapping, gene linkage and association studies in medicine; Genetic diagnosis - common molecular and cytogenetic techniques and the applications thereof; Carrier detection and predictive testing; Population screening - prenatal- and neonatal screening; Treatment of genetic diseases and gene based therapy; Pharmacogenetics and cancer genetics. Ethical issues. **Prerequisites:** [GTS251 GS] and [GTS261 GS] or [TDH]					
GTS366	**PLANT_GENETICS_&_BIOTECHN._366**				
NAS_GTS	GTS362	English	2 + 1	S2	18
Plant genetic resources and genetic systems. Plant genome organization and evolution. Control of gene expression in plants: cis and trans regulation, mRNA stability, gene silencing and RNA signaling, regulation of cytoplasmic genes, light/dark regulation, hormonal control and signal transduction during defense. Protein processing. Developmental genetics: seed/embryo development, control of vascular development and flowering. Genetics of male sterility and self-incompatibility. Plant biotechnology, tissue and cell cultures, plant transformation and regeneration. **Prerequisites:** [GTS251 GS] and [GTS261 GS] or [TDH] and [GTS351 is recommended] and [GTS352 is recommended]					
GVK420	**LARGE_STOCK_SCIENCE_420**				
NAS_VKU	n a	Double	2 + 0.5	S1	12
Industrial science and management of large stock. Revision of the principles of agricultural management. Aspects of business management of the large stock enterprise. Management programmes, production systems and techniques applicable to beef cattle, dairy cattle and horses. Design and planning of farm buildings and structures. Storage and handling of fodder. The handling and management of refuse. Hygiene and herd health programmes. **Prerequisites:** [RPL320] and [VGE301] and [VKU210]					
HNT210	**HUMAN_NUTRITION_210**				
MED_HNT	n a	Double	1 + 1	S1	12
Application of scientific principles in human nutrition. Menus (diet, mealplan, menus), ration scale, food composition tables. Standards and guidelines. **Prerequisite:** [VDG250 #]					
HSC260	**CROP_PROPAGATION_260**				
NAS_PGW	TBK221	Bilingual	2 + 0.5	S2	12
Propagation by seed: seed development, including pollination, fertilisation, embryogenesis fruit and seed development; principles and techniques of seed production; seed physiology; principles and practical aspects of seed germination; seed testing and legislation. Vegetative propagation: principles and techniques of rooting of cuttings; budding and grafting; propagation using specialized organs; micro propagation (tissue culturing). Students will get hands-on experience and will visit companies and nurseries. **Prerequisite:** [BOT161]					

HSC320	**FRUIT_PRODUCTION_320**				
NAS_PGW	HSC350, HSC362, HSC450	Bilingual	4 + 1	S2	26
Crop modelling, climate zones, climate requirements, cultivation regions, economic importance, anatomy and morphology, phonological modelling. Commercially important scions, rootstocks and their interactions. Crop management including fertilization, irrigation, pest and disease complex, tree and fruit manipulation, physiological disorders of economically important tropical, subtropical and temperate fruit crops produced in Southern Africa. **Prerequisites:** [HSC260] and [PPK251]					
HSC351	**NURSERY_MANAGEMENT_351**				
NAS_PGW	STZ311	Bilingual	2 + 0.5	S1	14
The nursery industry in South Africa. Greenhouse environmental control. Requirements for soil-based and soil-less growing media. The production of plants in a nursery. Management, economical and marketing aspects of different nursery operations. Practical experience on the experimental farm or in nurseries of own choice is compulsory for all participants in this module.					
HSC490	**ORNAMENT_HORTICULTURE_490**				
NAS_PGW	HSC352,451	Bilingual	2 + 0.5	S1	14
Economic importance of cut flowers and pot plants. Taxonomy and plant description. Climatic requirements and production practices including establishing, growth manipulation, nutritional requirements, irrigation, pest and disease control, harvest and post-harvest handling. Identification of ornamental plants for commercial and land-scape use. Climatic, reproduction and maintenance requirements for trees, palms, shrubs, flowering plants, ground covers, climbers and indoor plants. Functional and aesthetic value of plants in a landscape or indoors. Excursions to nurseries and practical experience on the experimental farm is compulsory for all participants in this module.					
IAS211	**ACTUARIAL_MATHEMATICS_211**				
NAS_VWT	n a	Bilingual	2 + 1	S1	12
Accumulation functions, interest, time value of money, compounding periods, cashflow models, equations of value, annuities certain, continuous time application, life tables, derivation of contingent probabilities from life tables, contingent payments, fundamentals of survival models, simple laws of mortality, expectation of life, elementary survival contracts, commutation functions, premiums for elementary survival contracts. **Prerequisites:** [WTW114 60%] and [WTW128 60%]					
IAS221	**ACTUARIAL_MATHEMATICS_221**				
NAS_VWT	n a	Bilingual	2 + 1	S2	12
Select and ultimate life tables, advanced life annuities, accumulation and discounting, life insurance, net and gross premiums, reserves, pension applications, statistical considerations, loan schedules, performance measurement, valuation of fixed interest securities. **Prerequisite:** [IAS211 GS]					

IAS282	**FINANCIAL_MATHEMATICS_282**				
NAS_VWT	AKM702	English	3 + 0	S2	12
Generalised cash-flow model. The time value of money. Interest rates. Discounting and accumulating. Compound interest functions. Equations of value. Loan schedules. Project appraisal. Investments. Simple compound interest problems. The "No Arbitrage" assumption and forward contracts. Term structure of interest rates. Stochastic interest rate models. **Prerequisite:** [IAS211 70%]					
IAS361	**INSURANCE_&_ACTUARIAL_APPL_361**				
NAS_VWT	n a	English	3 + 0	S1	18
Concepts of risk and insurance, legal aspects, common products, product providers, pricing, reserving, reinsurance, accounting, wider fields, professionalism. **Prerequisite:** [IAS211 GS]					
IAS382	**ACTUARIAL_MODELLING_382**				
NAS_VWT	n a	English	2 + 1	S2	20
Principles of actuarial modelling and stochastic processes. Markov chains and continuous-time Markov jump processes. Simulation of stochastic processes. Survival models and the life table. Estimating the lifetime distribution Fx(t). The Cox regression model. The two-state Markov model. The general Markov model. Binomial and Poisson models. Graduation and statistical tests. Methods of graduation. Exposed to risk. The evaluation of assurances and annuities. Premiums and reserves. **Prerequisite:** [IAS282]					
INB220	**INTERIOR_PLANNING_220**				
NAS_VBR	n a	Double	1 + 2	S2	16
Advanced colour theory; basic interior planning; visual presentations for clients; including storyboards and computer -aided design. Evaluation of floor plans; arrangement of furniture. **Prerequisites:** [ERG282 GS] and [OBG111]					
INB320	**INTERIOR_PLANNING_320**				
NAS_VBR	n a	Double	1 + 1	S2	11
The planning and arrangement of existing living and working spaces to provide for the various needs of the individual, family or group. Evaluation of floor plans; arrangement of furniture. **Prerequisites:** [ITW311] and [OBG111]					
INB322	**INTERIOR_PLANNING_322**				
NAS_VBR	INB321	Double	1 + 1	S2	11
The planning and designing of living and working spaces to provide for the different needs of the client. Visual and oral presentations for clients. **Prerequisites:** [ERG282] and [ITW311] and [OBG111]					
INB410	**INTERIOR_PLANNING_410**				
NAS_VBR	n a	Double	1 + 2	S1	23
Advanced interior planning **Prerequisites:** [CIL122] and [INB322]					

INF112	**INFORMATICS_112**				
EB_INF	n a	Bilingual	2 + 0	S1	10
Introduction to information systems, information systems in organisations, hardware: input, processing, output, software: systems and application software, organisation of data and information, telecommunications and networks, the Internet and Intranet. Transaction processing systems, management information systems, decision support systems, information systems in business and society, systems analysis, systems design, implementation, maintenance and revision. **Prerequisite:** [Par 1.2]					
INF153	**INFORMATICS_153**				
EB_INF	n a	Bilingual	2 + 0	S1	5
General systems theory, creative problem solving, soft systems methodology. **Prerequisite:** [Par 1.2]					
INF154	**INFORMATICS_154**				
EB_INF	n a	Bilingual	1 + 2	S1	5
Introduction to programming. **Prerequisite:** [Par 1.2]					
INF163	**INFORMATICS_163**				
EB_INF	n a	Bilingual	2 + 0	S2	5
The systems analyst, systems development building blocks, systems development, systems analysis methods, process modelling. **Prerequisite:** [INF153]					
INF164	**INFORMATICS_164**				
EB_INF	n a	Bilingual	1 + 2	S2	5
Advanced programming, use of a computer-aided software engineering tool. **Prerequisite:** [INF154]					
INF181	**INFORMATICS_181**				
EB_INF	n a	Bilingual	2 + 0	S1	3
Computer processing of accounting information.					
INF214	**INFORMATICS_214**				
EB_INF	n a	Bilingual	3 + 2	S1	14
Database design: The relational model, structured query language (SQL), entity relationship modelling, normalisation, database development life cycle. Practical introduction to database design. Databases: advanced entity relationship modelling and normalisation, object-oriented databases, database development life cycle, advanced practical database design. **Prerequisites:** [CIL111] and [CIL121]					
INF225	**INFORMATICS_225**				
EB_INF	n a	Bilingual	3 + 2	S2	14
Overview of systems infrastructure and integration. **Prerequisites:** [CIL111] and [CIL121]					

INF261	**INFORMATICS_261**				
EB_INF	n a	Bilingual	1 + 1	S2	7
Database management: transaction management, concurrent processes, recovery, database administration. New developments: distributed databases, client-server databases; practical implementation of databases. **Prerequisite:** [INF214]					
INF264	**INFORMATICS_264**				
EB_INF	n a	Bilingual	1 + 2	S2	8
Application of spreadsheets and query languages in an accounting environment. **Prerequisites:** [CIL111] and [CIL121] and [INF112]					
INF271	**INFORMATICS_271**				
EB_INF	INF253	Bilingual	1 + 1	J1	14
Systems analysis. Systems design: construction, application architecture, input design, output design, interface design; internal controls, program design, object design; project management, system implementation, use of computer-aided development tools. **Prerequisites:** [CIL111] and [CIL121] and [INF163] and [INF164]					
INF272	**INFORMATICS_272**				
EB_INF	INF263	Bilingual	2 + 0	J1	14
Use of computer-aided development tools, advanced programming. **Prerequisites:** [CIL111] and [CIL121] and [INF163] and [INF164]					
INK110	**INTERIOR_PRODUCTION_110**				
NAS_VBR	n a	Double	1 + 1	S1	9
Basic and more advanced construction and sewing techniques; use of various sewing machines and materials in the construction of selected interior products.					
INK210	**INTERIOR_PRODUCTION_210**				
NAS_VBR	n a	Double	1 + 1	S1	10
Evaluation of ready-made interior products; measuring, planning and construction of custom made interior products: window coverings, upholstery and assorted furnishings. **Prerequisite:** [INK110]					
INK310	**INTERIOR_PRODUCTION_310**				
NAS_VBR	n a	Double	1 + 1	S1	11
A study of fashion and market trends in interior textile products. Development of a sample file. Exposure to mass production of selected interior products. **Prerequisite:** [INK210]					
IPO380	**INTERIOR_EXPERIENTIAL_TRAI.380**				
NAS_VBR	n a	Double		S2	8
Controlled experiential training. **Prerequisites:** [INK310] and [ITW311]					
ITP481	**PROJECT:_INTERIOR_MERCHAN._481**				
NAS_VBR	ITP480	Double	1 + 1	J1	22
Project to illustrate the ability to integrate relevant theory in the planning and					

presentation of an interior merchandise project for specific clients. **Prerequisites:** [INB322] and [INB410 #] and [SEM381 GS] and [Final-year status]					
ITW121	**INTERIOR_MERCHANDISE_121**				
NAS_VBR	ITW120	Double	2 + 1	S2	8
Household material and equipment studies: Metals and non-metals used for the manufacturing of objects, equipment and components of appliances for household use. Study and evaluation of selected non-electrical household equipment in terms of specific end-use situations.					
ITW221	**INTERIOR_MERCHANDISE_221**				
NAS_VBR	ITW220	Double	2 + 1	S2	10
Equipment studies: study of major and portable electrical household appliances in terms of consumer needs, specific end use situations, running and life cycle costs, sustainability aspects and environmental concerns to facilitate consumer decision making. **Prerequisite:** [ITW121]					
ITW261	**INTERIOR_MERCHANDISE_261**				
NAS_VBR	n a	Double	2 + 1	K3	5
Equipment studies: study of selected major and portable electrical household appliances in terms of consumer needs, specific end use situations, running and life cycle costs, sustainability aspects and environmental concerns to facilitate consumer decision making.					
ITW311	**INTERIOR_MERCHANDISE_311**				
NAS_VBR	ITW310	Double	2 + 1	S1	11
A study of furniture (case goods and upholstered), floor coverings, wall finishes, lighting and household textile products in terms of construction techniques, composition, properties, quality indicators, advantages and disadvantages, appearance, durability, cost and maintenance and care factors. **Prerequisite:** [ITW121]					
KEP220	**CULTURAL_EATING_PATTERNS_220**				
NAS_VBR	VDG120/KEP261	Double	3 + 0	S2	12
Origin and development of food habits; Factors influencing food habits and choice; Dynamics of food habits. Influence of religion on food habits. Food habits of different ethnic groups. The influence of culture on cuisines. Study of the cuisines of selected African, European and Eastern countries.					
KEP261	**CULTURAL_EATING_PATTERNS_261**				
NAS_VBR	VDG120	Double	3 + 0	K3	6
Origin and development of food habits; Factors influencing habits and choice; Dynamics of food habits. Influence of religion on food habits. Food habits of different ethnic groups.					
KGK110	**HISTORY_OF_ART_110**				
GW_KGK	KGK155, KGK156	Double	3 + 0	S1	12
Survey of art and ideas: This module focuses on a contextual survey of western art from prehistoric times to the present. Emphasis is placed on the interaction between art, culture, and ideas.					

KGK120	HISTORY_OF_ART_120				
GW_KGK	KGK 157	Double	3 + 0	S2	12
Introduction to design history: Overview of design in the twentieth century as both product and process. Four themes are briefly outlined: the development of the profession; the arena of production; the history of consumption and the impact of design on everyday life. Following the overview particular consideration is given to the history of graphic design, reproduction and representation from the Industrial Revolution to the present.					
KGK356	**SOUTH_AFRICAN_ART:_THEMES_356**				
GW_KGK	n a	Double	3 + 0	K3	15
This module focuses on the art historical concepts of representation and identity in contemporary South African art. Different aspects of representation and identity are investigated by means of the art of artists such as Leora Faber, Wilma Cruise, Robert Hodgins, Tommy Motswai and Minette Vari.					
KLD210	**COSTUME_&_FASHION_HISTORY_210**				
NAS_VBR	KLD220	Double	3 + 0	S1	12
Costume and fashion history: Appearance characteristics of Western dress. Influencing factors. Evolution of styles from Ancient Egyptian up to and including the present.					
KLD222	**FASHION_FORECASTING_222**				
NAS_VBR	KLD411	Double	3 + 0	S2	12
The South African fashion industry: Basic principles of fashion; fashion as a product; and the consumer. Fashion production: Haute Couture and ready-to-wear clothes. Fashion forecasting and fashion analyses.					
KLD322	**SOC.&CULT.ASPECTS_OF_CLOTH.322**				
NAS_VBR	KLD221, KLD320	Double	4 + 0	S2	20
Social-Psychological and cultural aspects of clothing: Development of a framework; Symbolic-Interaction as a framework; the cognitive approach. Development of the self: self and self-concept: the body as indicator; personal values and norms. Appearance management and presentation of the self: role acceptance, identity, social control, roles in social cognition. Cultural context and dress: reflection of human adaptation; culture creations (technical, moral and ceremonial patterns); societies and clothing; beauty standards and beauty ideals. Social context, identity, change and clothing: the family, politics, religion, economy and the role of clothing as a reflection of social and personal identities; mentefacts and identities; social change and clothing.					
KLD410	**CLOTHING_RETAIL_MANAGEMENT_410**				
NAS_VBR	n a	Double	3 + 0	S1	15
Clothing retail and marketing aspects: fashion marketing communication; clothing ranges; textiles, footwear and accessories merchandise characteristics; customer service; packing and packaging. Global interdependence: appreciation of cultural differences; respect for diversity; trade agreements and implications; understanding of import/export regulations. **Prerequisite:** [Fourth-year status]					

KLD420	CLOTHING_MERCHANDISING_420				
NAS_VBR	KLD420, KLD411	Double	3 + 0	S2	15
Clothing merchandise managerial aspects: planning, purchasing, control; search for suppliers; relationship with suppliers; management roles and responsibilities; technology; ethical and legal behaviour. Visual merchandising: basic components; tools and techniques; planning. Retail and wholesale: Introduction: factors influencing stock movement; redistribution of stock; merchandising processes. Planning stock movement; factors influencing buying strategies. **Prerequisite:** [Fourth-year status]					
KLR110	**CLOTHING_PROD:SEWING_TECH_110**				
NAS_VBR	n a	Double	1 + 1	S1	9
A study of sewing appliances and equipment and the handling and use of different types of fabric. Functional and creative sewing techniques; grading and quality assurance.					
KLR120	**CLOTHING_PRODUCT:PROCESSES_120**				
NAS_VBR	n a	Double	1 + 1	S2	9
Processes (collars, pockets, buttonholes, fasteners, belts, hems, etc.) Application: Unstructured, multi-sized garment or selected interior product. **Prerequisite:** [KLR110]					
KLR211	**FLAT_PATTERN_DESIGN_211**				
NAS_VBR	KLR320	Double	0 + 2	S1	12
Flat pattern design. Production design (flat pattern design + CAD) **Prerequisite:** [KLR120]					
KLR221	**PATTERN_USE_AND_GOOD_FIT_221**				
NAS_VBR	KLR210	Double	1 + 1	S2	10
Pattern use and good fitting. Wardrobe planning strategies. **Prerequisite:** [KLR211]					
KLR311	**TAILORING_311**				
NAS_VBR	KLR220	Double	1 + 1	S1	11
Tailoring. **Prerequisites:** [KLR211] and [KLR221]					
KLR321	**CLOTHING_PRODUCTION_321**				
NAS_VBR	KLR310	Double	1 + 1	S2	11
Small scale production: Industrial machines, production systems, quality assurance. **Prerequisite:** [KLR221]					
KLR411	**PRODUCT_DEVELOPMENT_411**				
NAS_VBR	KLR420	Double	2 + 1	S1	19
Production: product analysis, planning and execution. Application clothing, textile and consumer knowledge by utilising a CAD-program for planning and assembling apparel. The small business enterprise: Introduction: clothing small business enterprises; types and locations. Marketing aspects: target market selection; product mix; pricing methods; distribution channels; marketing communication mix; financial aspects. **Prerequisites:** [KLR221] and [KLR321]					

KOB183	COMMUNICATION_MANAGEMENT_183				
EB_BEM	n a	Bilingual	3 + 0	K3	5
(Module content will be adapted in accordance with the appropriate degree programme.) *Applied business communication skills* Acquiring basic business communication skills will enhance the capabilities of employees, managers and leaders in the business environment. An overview of applied skills on the intrapersonal, dyadic, interpersonal, group (team), organisational, public and mass communication contexts is provided. The practical part of the module (for example, the writing of business reports and presentation skills) concentrates on the performance dimensions of these skills as applied to particular professions.					
KTP220	**EXPERIENTIAL_TRAINING_220**				
NAS_VBR	n a	Double	0 + 1	S2	4
Compulsory practical training in the clothing industry during the year, approved in consultation with the head of the department.					
KTP402	**CLOTHING_TEXTILE_PROJECT_402**				
NAS_VBR	n a	Double	0 + 1	J1	18
Project in field of application: planning and execution. **Prerequisites:** [SEM381] and [Fourth-year status]					
KVK420	**SMALL_STOCK_SCIENCE_420**				
NAS_VKU	n a	Afrikaans	2 + 0.5	S2	12
Small stock management, shearing organisation, sheds and equipment, pens, dipping, drinking and feeding facilities. Preparation and marketing of hides, mohair and karakul. Lambing seasons and herd management. Management programmes for the production of wool, meat, karakul pelt and mohair according to the particular ecological region and for conditions of drought. Herd health programmes. **Prerequisites:** [RPL320] and [VGE301] and [VKU220]					
LBU260	**AGROCLIMATOLOGY_260**				
NAS_PGW	LBU260, LKM262	Bilingual	2 + 0.5	S2	12
Climate in Southern Africa. Irradiation and energy balance. Hydrological cycle with special reference to downpour and evaporation from vegetative surfaces. Wind-breaks and frost control. Influence of climate on farming systems. Instrumentation and measurement of downpour, evaporation, radiation, temperature, humidity and wind. This module may only be taken by students enrolled for a BSc(Agric) programme.					
LEK220	**AGRICULTURAL_ECONOMICS_220**				
NAS_LEK	n a	Double	3 + 0	S2	12
The agribusiness system; the unique characteristics of agricultural products; marketing functions and costs; market structure; historical evolution of agricultural marketing in South Africa. Marketing environment and price analysis in agriculture: Introduction to supply and demand analysis. Marketing plan and strategies for agricultural commodities; market analysis; product management; distribution channels for agricultural commodities, the agricultural supply chain, the agricultural futures market. **Prerequisites:** [LEK251] and [LEK252] or [EKN113 and/or EKN120]					

LEK251	INTRO.TO_FIN.MAN.IN_AGRICU.251				
NAS_LEK	n a	Double	3 + 0	K1	6
Introduction to financial management in agriculture: Farm management and agricultural finance, farm management information; analysis and interpretation of farm financial statements; risk and farm planning. Budgets: partial, break-even, enterprise, total, cashflow and capital budgets. Time value of money.					
LEK252	**INTR.TO_AGRIC._PROD._ECON._252**				
NAS_LEK	n a	Double	3 + 0	K2	6
Introduction to production and resource use: the agricultural production function, total physical product curve, marginal physical product curve, average physical product curve, stages of production. Assessing short-term business costs; Economics of short-term decisions. Economics of input substitution: Least-cost use of inputs for a given output, short-term least-cost input use, effects of input price changes. Least-cost input use for a given budget. Economics of product substitution. Product combinations for maximum profit. Economics of crop and animal production. **Prerequisite:** [LEK251]					
LEK310	**AGRICULTURAL_ECONOMICS_310**				
NAS_LEK	n a	Bilingual	3 + 0	S1	12
Historical evolution of South African agricultural policy. Agriculture and the state: reasons for government intervention. Theoretical aspects of agricultural policy. Introduction to agricultural policy analysis. Welfare principles, pareto optimality. Macro-economic policy and the agricultural sector. International agricultural trade. **Prerequisites:** [LEK251 or EKN110] and [LEK252 or EKN120]					
LEK320	**AGRICULTURAL_ECONOMICS_320**				
NAS_LEK	n a	Bilingual	3 + 2	S2	18
The modern food and agribusiness sistem: The financing decision: capital acquisition, different capital sources, capital structures. The investment decision and working capital management. Strategic marketing. Operational management and human resources management. **Prerequisites:** [LEK220] and [LEK251] and [LEK252]					
LEK415	**AGRICULTURAL_ECONOMICS_415**				
NAS_LEK	n a	Bilingual	3 + 1	S1	18
Derivative instruments in agriculture: To prepare students for taking the SAFEX Agricultural Markets Division brokerage exam. Giving an in-depth knowledge on the importance of hedging. Giving an in-depth knowledge on designing and implementation of low/zero risk hedging strategies. Introduction to the mathematics of portfolio management and mathematical modeling of derivatives. Working knowledge of the mathematical relationships in the management of a hedged portfolio. Working knowledge on the applicable software for managing derivative portfolios. Introduction into the management of option portfolios. To expand the thinking on the uses of derivatives, by also dealing with the hedging of diesel cost, interest rates and weather events. **Prerequisites:** [EKN110] and [LEK220] and [WTW134]					
LEK421	**AGRICULTURAL_ECONOMICS_421**				
NAS_LEK	n a	Bilingual	3 + 2	S2	24
Price and production function analysis; Input - output, input - input and product -					

product relationships; profit maximization; the production process through time, economies of size; risk and risk management; linear programming. **Prerequisites:** [LEK451] and [STK210] and [STK281]					
LEK424	**INTRODUCT.TO_RESOURCE_ECON.424**				
NAS_LEK	n a	English	3 + 0	S2	15
This module reviews the origins and evolution of natural and environmental resource economics and its present-day main paradigms. Sources of externalities and causes of environmental degradation are examined. An introduction to the concepts and methods backing the design and implementation of environmental policies are provided. Economic valuation of natural and environmental resources is introduced. **Prerequisites:** [LEK251] and [LEK252]					
LEK451	**AGRI.DEMAND_&_SUPP.ANALYSIS_451**				
NAS_LEK	n a	Double	3 + 2	K1	12
This module will focus on the demand and supply shifters as well as the elasticities, flexibilities, and impact multipliers. After providing an appropriate background in the theoretical concepts of demand and supply these basics will be applied in the generation of econometric simulation models. Practical experience in the formulation of these models will be attained from practical sessions. The student will submit a project in which he/she must analyse the demand or supply patterns of a commodity of his/her choice by generating an econometric model. **Prerequisites:** [LEK220] and [LEK252] and [STK281]					
LEK452	**COMMODITY_PRICE_ANALYSIS_452**				
NAS_LEK	n a	Double	3 + 2	K2	12
This module will focus primarily on price determination under different market structures, which will be followed by practical sessions on measuring market structures in various ways. This will include the calculation of market concentration. Some time will also be spent on measuring price changes by using indexes, and especially seasonal indexing. All of this will be supported by the relevant practical sessions. The relevance of changes to the main macro economic indicators will be discussed throughout this course. **Prerequisites:** [LEK220] and [LEK252] and [LEK451] and [STK281]					
LKM450	**ENVIRONMENTAL_BIOPHYSICS_450**				
NAS_PGW	LKM451,452	Bilingual	2 + 0.5	S1	16
Environmental variables. Quantitative description and measurement of atmospheric environmental variables and water in organisms. Mass and energy fluxes. Quantitative description of energy fluxes in organisms' environments. Energy balances of animals and plant communities will be derived. **Prerequisite:** [WTW134]					
LNT400	**LEARNING_THEORIES_400**				
OPV_KS	n a	Bilingual		J1	12
This study focuses on different theories of learning. Students will be challenged to explore most recent research on learning style preferences and motivation, whole-brain learning and multiple intelligences and possible causes of poor and underachievement to enable them to cater for the diversity of learners. Concepts, elements and skills of critical and creative thinking will be dealt with to create challenging learning environments (Web-based).					

MBY161	INTRODUCTION_TO_MICROBIOLO.161				
NAS_MBY	n a	Bilingual	2 + 0.5	S2	8
General anatomy and morphology of bacteria, viruses and fungi. Basic nutritional requirements of micro-organisms and the effect of environmental factors on microbial growth. Micro-organisms as essential components of ecospheres: plant, water and soil ecosystems. Food decay, food poisoning and preservation of food by micro-organisms. Basic principles involved in disinfection, sterilization and control of microbes; techniques for microbial repression: sterilization by using heat, radiation, filtration, chemical; decimation of numbers.					
MBY251	**GROWTH_DIVERS.&CONTROL/BAC.251**				
NAS_MBY	n a	Bilingual	2 + 1	S1	12
Envelope of gram positive and gram negative rods. Growth of bacteria, replication of the genome, regulation of septum formation, diversity of cell division mechanisms across the prokaryotes, bacterial survival structures. Control of bacterial growth; classes of antibacterial agents, cellular targets for growth inhibition and killing of cells. Energy sources, harvesting from light versus oxidation, regulation of catabolic pathways, chemotaxis. Nitrogen metabolism, iron-scavenging. Alternative electron acceptors: denitrification, sulphate reduction, methanogenesis. Structure and function versus phylogenetics. Biodiversity; bacteria occurring in the natural environment (soil, water and air), associated with humans, animals, plants, and those of importance in foods and in the water industry. **Prerequisite:** [MBY161 GS]					
MBY261	**GROWTH_ACT.&_CONTROL/FUNGI_261**				
NAS_MBY	n a	Bilingual	2 + 1	S2	12
Organisation and molecular architecture of fungal thalli, chemistry of the fungal cell. Mechanisms, quantification, regulation of and chemical and physiological requirements for growth, nutrient acquisition, primary metabolism; secondary metabolism; regulation of metabolism; mating and meiosis; spore development; spore dormancy, dispersal and germination. Classes of antifungal agents, cellular targets for inhibition and killing of cells. Fungi as saprobes in soil, air, plant, aquatic and marine ecosystems; role of fungi as decomposers and in the deterioration of materials; fungi as predators and parasites; mycoses, mycetisms and mycotoxicoses; fungi as symbionts of plants, insects and animals. Applications of fungi in biotechniology. **Prerequisite:** [MBY161]					
MBY351	**STRUCT.&_DIVERS.OF_VIRUSES_351**				
NAS_MBY	n a	English	2 + 1	S1	18
Introduction to the viruses as a unique kingdom inclusive of their different hosts, especially bacteria, animals and plants; RNA and DNA viruses; viroids, tumour viruses and oncogenes, mechanisms of replication, transcription and protein synthesis; effect on hosts; viral immunology; evolution of viruses. **Prerequisites:** [BCM253 + BCM254] and [CMY127] and [MBY161]					
MBY352	**ENVIRONMENTAL_MICROBIOLOGY_352**				
NAS_MBY	n a	Bilingual	2 + 1	S1	18
Basic principals in microbial ecology; microbial evolution, microbial interactions, ecosystems and communities, gene transfer, abiotic factors and extreme environments, microbial habitats which include air, water, soil, man, insects, animals					

and plants. The role of micro-organisms in biogeochemical cycling and microbial food webs. Potential exploitation of extreme environments, organisation of native populations in extreme environments, ecological aspects of deterioration control, soil, waste and water management. **Prerequisite:** [MBY161]					
MBY353	**VERTIBRATE-MICROBE_INTERAC.353**				
NAS_MBY	n a	Bilingual	2 + 1	S1	18
Normal interactions between humans or animals and microorganisms; Host-pathogen interactions; Principles of pathogenesis; Important infectious diseases of man and animals; Principles of diagnostics; Introduction to epidemiology.					
MBY354	**VETERINARY_VIROLOGY_354**				
NAS_MBY	n a	English	2 + 0	S1	9
Introduction to viruses important in veterinary science; mechanisms of virus replication, transcription and protein synthesis; effect on hosts; viral immunology; epidemiology and evolution of viruses; prions; diagnoses and control of viral diseases and viral vaccines. **CAPITA SELECTION ONLY FOR BVSc PROGRAMME.** **Prerequisites:** [BCM253 + BCM254] and [CMY127] and [MBY161]					
MBY361	**TRENDS_IN_MICROBIOLOGY_361**				
NAS_MBY	n a	English	2 + 1	S2	18
Biotechnological advances and gene-based innovations in Microbiology: Microbial diagnostics and epidemiology; microbial biosensors; vaccinology and therapeutic agents; biological control of plant pathogens; microbial diversity and bioprospecting; and bioremediation. Regulation, intellectual property rights and patenting in biotechnology. **Prerequisites:** [BCM253 + BCM254] and [GTS261] and [MBY251]					
MBY362	**FOOD_MICROBIOLOGY_362**				
NAS_MBY	n a	English	2 + 1	S2	18
Food microbiology: different organisms involved, their isolation, screening and improvement. Microbial quality and spoilage of food: meat, poultry, seafood, dairy products, fruits, vegetables and grains. Microbial food safety: foodborne pathogens, microbes and public health. Protective measures: preservation. Food fermentations: fermentation types, principles and organisms involved. Product extraction, downstream processing, examples: dairy, beer, wine, amino acids, enzymes, traditional products. Microbiological examination of foods: Conventional approaches, alternative methods; rapid methods. Controlling food quality: Microbiological criteria, GMPs, HACCP, Risk analysis. **Prerequisite:** [MBY251]					
MBY363	**MOLEC._BIOL.OF_PROKARYOTES_363**				
NAS_MBY	n a	English	2 + 1	S2	18
Modification of genetic material: DNA damage and damage repair, photoreactivation, SOS response. Mobile elements, insertion sequences, transposons. Control of operons and regulons, negative control, positive control, mixed control, regulation by upstream DNA structure, sigma factors, the role of recombination in expression, regulation of translation, DNA-protein interactions. Posttranslational control and modifications of proteins: allosteric control, covalent modifications, posttranslational control by					

compartmentalisation. Global regulatory networks, carbon catabolyte repression, alarmones, signal transduction, chemotaxis, regulation of fermentation and respiration, stress responses, adaptation to extreme environments. Folding of proteins, protein export, repair of damaged proteins. **Prerequisites:** [BCM253 + BCM254] and [CMY127] and [MBY161]					
MBY364	**GENE.MANIPULATION/MICROBES.364**				
NAS_MBY	n a	English	2 + 1	S2	18
Isolation of clonable DNA (genomic libraries, cDNA synthesis) cloning vectors (plasmids, bacteriophages, cosmids) plasmid incompatibility and control of copy number. Ligation of DNA fragments, modification of DNA end and different ligation strategies. Direct and indirect methods for the identification of recombinant organisms. Characterization (polymerase chain reaction, nucleic acid sequencing) and mutagenisis of cloned DNA fragments. Gene expression in Gram negative (E.coli) Gram positive (B.subtilis) and yeast cells (S.cerevisea). Use of Agrobacterium and baculoviruses for gene expression in plant and insect cells respectively. Applications in protein engineering, diagnostics and synthesis of useful products. **Prerequisites:** [BCM253 + BCM254] and [CMY127] and [MBY161]					
MGW112	**PEOPLE_&_THEIR_ENVIRONMENT_112**				
MED_MGW	n a	English	4 + 0	S1	6
This module comprises basic psychology and sociology concepts relevant to Medicine. Basic psychiatric concepts are also taught.					
MLB111	**MOLECULAR_AND_CELL_BIOLOGY_111**				
NAS_GTK	n a	Double	4 + 1	S1	16
Introductory study of the ultrastructure, function and composition of representative cells and cell components. General principles of cell metabolism, molecular genetics, cell growth, cell division and differentiation.					
MLB133	**MOLECULAR_AND_CELL_BIOLOGY_133**				
NAS_GTK	n a	English	2 + 2	S1	8
This module includes 2dpw. The scientific method, the meaning of life, principles of microscopy, chemistry of the cell, introductory study of the structure, function and composition of akaryotes, HIV/AIDS, the immune system and other health issues, ecosystems and human interference. **Prerequisite:** [BSc 4 year programme]					
MLB143	**MOLECULAR_AND_CELL_BIOLOGY_143**				
NAS_GTK	n a	English	2 + 2	S2	8
This module includes 2dpw. Biochemistry of the cell, introduction to the structure, function and composition of prokaryotic and eukaryotic cells, introduction to taxonomy and systematics, energy and cellular metabolism, photosynthesis. **Prerequisite:** [MLB133]					
MLB153	**MOLECULAR_AND_CELL_BIOLOGY_153**				
NAS_GTK	n a	English	2 + 2	S1	8
This module includes 2dpw. Cell growth and cell division, Mendelian and human genetics, principles of molecular genetics, principles of recombinant DNA technology and its application. **Prerequisite:** [MLB143]					

MTL181	**MEDICAL_TERMINOLOGY_181**				
GW_MTL	n a	Double	2 + 0	S1	6
The module entails the acquisition of a basic medical orientated vocabulary compiled from Latin and Greek stem forms combined with prefixes and suffixes derived from these languages. The manner in which the meanings of medical terms can be determined by analyzing the terms into their recognizable meaningful constituent parts is taught and exercised. The functional application of medical terms in context as practical outcome of terminological application is continually attended to.					
MTT210	**FURNITURE&_TEXTILE_HISTORY_210**				
NAS_VBR	n a	Double	3 + 0	S1	12
Influences of ideologies, social institutions and technology on the development of Western and other material cultures, especially on furniture and textiles. Style periods from Egyptian to the French Revolution.					
MTT220	**FURNITURE&_TEXTILE_HISTORY_220**				
NAS_VBR	n a	Double	3 + 0	S2	12
Influences of ideologies, social institutions and technology on the development of Western and other material cultures, especially on furniture and textiles. Style periods from early nineteenth century to the present. **Prerequisite:** [MTT210 GS]					
OBG111	**DESIGN_PRINCIPLES_111**				
NAS_VBR	OBG110	Double	1 + 1	S1	7
Introduction to basic concepts in design (Design elements and principles) and practical application in interior planning and design, foods, clothing. Theories of colour.					
OBS114	**BUSINESS_MANAGEMENT_114**				
EB_OBS	OBS113	Bilingual	3 + 0	S1	10
Introduction to and overview of general management, especially regarding the five management tasks, strategic management, contemporary developments and management issues, financial management, marketing, public relations. Introduction to and overview of the value chain model, management of the input, management of the purchasing function, management of the transformation process with specific reference to production and operations management, human resources management, and information management, corporate governance, black economic empowerment (BEE).					
OBS124	**BUSINESS_MANAGEMENT_124**				
EB_OBS	OBS123	Bilingual	3 + 0	S2	10
The nature and development of entrepreneurship, the individual entrepreneur. Characteristics of South African entrepreneurs. Looking at the window of opportunity. Getting started (business start-up). Exploring different routes to entrepreneurship: entering a family business, buying a franchise, home-based business and the business buyout. This semester also covers how entrepreneurs can network and find support in their environments. Case studies of successful entrepreneurs, South African entrepreneurs are studied.					
OBS156	**BUSINESS_MANAGEMENT_156**				
EB_OBS	n a	Bilingual	3 + 0	K2	5
A brief introduction to business management which includes a description of a					

business enterprise and its environments and stake holders; the business person's task in establishing a business, and the obtaining of finance; the general management principles which are used to manage the whole enterprise and its different functions in order to ensure competitiveness.					
OBS210	**BUSINESS_MANAGEMENT_210**				
EB_OBS	n a	Bilingual	3 + 0	S1	16
The role of logistics in an enterprise, definition and scope of customer service, electronic and other logistics information systems, inventory management, materials management with special reference to Japanese systems, management of the supply chain. Methods of transport and transport costs, types and costs of warehousing, electronic aids in materials handling, cost and price determination of purchases, organising for logistics management, methods for improving logistics performance.					
OBS220	**BUSINESS_MANAGEMENT_220**				
EB_OBS	n a	Bilingual	3 + 0	S2	16
Project management: Introduction. Project management concepts, needs identification, the project manager and the project team, types of project organisations, project communication and documentation. Planning and control: planning, scheduling and schedule control of projects, resource considerations and allocations, cost planning and performance evaluation.					
OBS310	**BUSINESS_MANAGEMENT_310**				
EB_OBS	n a	Bilingual	4 + 0	S1	20
Human resource management and development. The environment in which human resource management takes place, job analysis, strategic human resource planning, equal employment opportunities, planning and management of training, development and careers, functioning in a global environment. The nature of negotiation preparation for negotiation, negotiating for purposes of climate, creation, persuasive communication, handling conflict and aggression, specialised negotiation, and collective bargaining in the South African context.					
OBS321	**ENTREPRENEURSHIP_321**				
EB_OBS	n a	Bilingual	3 + 0	S2	20
*General service module available as elective module to some BCom degrees. Performance motivation: development of positive motives, role models, determining of the level of achievement motivation, reinforcement of the need for performance motivation, strategies and action plans. Creativity, innovation, need for achievement, entrepreneurial role models, and the development of risk propensity.					
OKW413	**WEED_SCIENCE_413**				
NAS_PGW	OKW451,452	Bilingual	2 + 0.5	S1	14
Identification of important weeds of crops, gardens and recreational areas. Identification of alien invasive and indigenous encroaching species. Impacts of weeds on desirable vegetation. Interference between crop and weed species through allelopathy and competition phenomena. Role of weeds in plant-biodiversity and crop production potential. Weeds in annual and perennial crop situations. Weed biology and ecology. Mechanical, cultural, biological and chemical weed management practices. Integrated weed management. Herbicide formulations and application techniques. Modes of action of herbicides, and their behaviour and fate in the environment. **Prerequisite:** [PPK251]					

PAS300	PROD.ANIM.BEHAV.HAND.&WELF.300				
VET_PAS	AHG300	English	1 + 1	J1	12
Introduction to the normal behavioural repertoire of cattle, pigs, sheep and goats and selected economically important behavioural aberrations and their prevention. Animal welfare aspects of these behavioural patterns. Practical animal handling and the development of proficiency in a range of farm animal procedures. **Prerequisite:** [Only students selected for BSc: Veterinary Biology]					
PEL400	**PROFESSIONAL_ETHICS_&_LAW_400**				
OPV_OPV	n a	Bilingual		J1	6
This module explores and reflects on human rights, environmental and democratic issues impacting on own practices. Critical analysis of education systems (education policy) and its impact on the micro level (in the classroom) in education. Knowledge of the elements of effective school management, systems of discipline and defining activities that promote an awareness of citizenship, human rights and the principles and values of the Constitution. Interpret educational legislation dealing with HIV/Aids, drugs and violence. Identifying and internalising ethical professional educator behaviour.					
PGB410	**PROJECT:_RESEARCH_METHODOL.410**				
NAS_VBR	n a	Bilingual	2 + 0	S1	10
Research methodology. Planning, executing and reporting a research project in Hospitality Management.**Prerequisite:** [Final-year status]					
PGB420	**PROJECT:_HOSPITALITY_MANAG.420**				
NAS_VBR	n a	Bilingual	4 + 0	S2	20
Research methodology. Planning, executing and reporting a research project in Hospitality Management. **Prerequisite:** [PGB410 and Final-year status]					
PGW350	**SOIL_WATER_RELA.&_IRRIGAT._350**				
NAS_PGW	PGW351,352	Bilingual	2 + 0.5	S1	16
Quantitative description and measurement of soil water content and potential as well as saturated and unsaturated hydraulic conductivity. Modelling water flow in soil (Darcy's law, Richards's equation). Infiltration, redistribution, evaporation, runoff and percolation. Irrigation in South Africa. Modelling and managing the soil water balance. Plant water consumption and the Soil-Plant-Atmosphere Continuum. Irrigation scheduling (soil, plant and atmosphere approaches). Managing poor quality water. Irrigation systems. Module includes a field trip to an irrigation scheme. **Prerequisite:** [GKD250]					
PGW400	**SEMINAR_400**				
NAS_PGW	PGW400	Bilingual	1 + 0	J1	20
Basic principles of the scientific process. Literature accessing and article assessment. Manuscript preparation and presentation of seminars. Basic instruction on the use of visual aids, etc. for effective oral presentations.					
PGW421	**EXPERIMENTAL_DESIGN_&_ANAL.421**				
NAS_PGW	PGW401	Bilingual	2 + 0.5	S2	14
Basic experimental designs. Measurement and control over experimental error.					

Factorial experiments and interactions. Analysis of variance (ANOVA) and data interpretation. **Prerequisite:** [BME120]					
PHY131	**GENERAL_PHYSICS_131**				
NAS_PHY	n a	Double	4 + 1	S1	16
This course is intended for students who require only a single semester of physics. Students who have passed the PHY131 course but would prefer to continue with the PHY171 year course, will have to do an additional course. This change can only be made after approval by the Head of the Department. Units, vectors, one dimensional kinematics, dynamics, work, equilibrium, sound, liquids, heat, electric potential and capacitance, direct current and alternating current, optics, modern physics, radio activity. **Prerequisite:** [Par 1.2]					
PHY133	**PHYSICS_133**				
NAS_PHY	n a	English	2 + 2	S1	8
This module includes 2dpw. Heat: temperature and scales, the kinetic molecular model, work, energy and heat, calorimetry, specific heat, expansion, heat transfer. Measurements: SI-units, measuring error and uncertainty,(graphs), significant figures, mathematical modelling. Geometrical optics: reflection, refraction, dispersion, mirrors, thin lenses, instruments. **Prerequisite:** [BSc 4 year programme]					
PHY141	**GENERAL_PHYSICS_141**				
NAS_PHY	n a	English	1 + 0	S2	16
This module includes 2 tutorial sessions. This is an anti-semester presentation of the module PHY 131 General Physics 131. Refer to PHY 131 for the content description. Students will not be credited for both PHY 131 and PHY 141 toward their degree. **Prerequisites:** [PHY131 GS as well as 50% (min) for the practical component of PHY131] or [TDH]					
PHY143	**PHYSICS_143**				
NAS_PHY	n a	English	2 + 2	S2	8
This module includes 2dpw. Waves: sound, intensity, superposition, interference, standing waves, resonance, beats, Doppler effect. Physical optics: Young-interference, coherence, thin layers, diffraction, gratings, polarisation. Hydrostatics and dynamics: density, pressure, Archimedes' law, continuity, Bernouli. **Prerequisite:** [PHY133]					
PHY153	**PHYSICS_153**				
NAS_PHY	n a	English	2 + 2	S1	8
This module includes 2dpw. Vectors. Kinematics of a point: relative, projectile, circular motion. Dynamics: Newton's laws, friction. Work: point masses, gases (ideal gas law), gravitation, spring, power. Kinetic energy. Potential energy: conservative forces, gravitation, spring, conservation of mechanical energy and energy, conservation of momentum. Impulse and collisions. System of particles: centre of mass, Newton's laws, Rotation: torque, conservation of angular momentum, equilibrium, centre of gravity. **Prerequisite:** [PHY143]					

PHY171	FIRST_COURSE_IN_PHYSICS_171				
NAS_PHY	n a	Double	4 + 1	J1	32

SI-units. Significant figures. Waves: sound, intensity, superposition, interference, standing waves, resonance, beats, Doppler. Geometrical optics: Reflection, refraction, dispersion, mirrors, thin lenses, instruments. Physical optics: Young-interference, coherence, thin layers, diffraction, gratings, polarisation. Hydrostatics and dynamics: density, pressure, Archimedes' law, continuity, Bernouli. Heat: temperature and scales, specific heat, expansion, heat transfer. Vectors. Kinematics of a point: relative, projectile, and circular motion. Dynamics: Newton's laws, friction. Work: point masses, gases (ideal gas law), gravitation, spring, power. Kinetic energy. Potential energy: conservative forces, gravitation, spring. Conservation of mechanical energy and energy. Conservation of momentum. Impulse and collisions. System of particles: centre of mass, Newton's laws. Rotation: torgue, conservation of angular momentum, equilibrium, centre of gravity. Simple harmonic motion and pendulums. Coulomb's law. Electric field: dipole, Gauss' law. Potential. Capacitance. Electric currents: resistance, resistivity, Ohm's law, energy, power, emiconductors, superconductors, emf, RC-circuits. Magnetism: Hall effect, Biot-Savart. Faraday's and Lenz's laws. LR-circuits. Alternating current: RLC-circuits, power, transformers. Modern physics: Theory of special relativity, wave/particle nature, photoelectric effect, matter waves, quantum theory, infinite potential well, hydrogen atom and spectra, nuclear physics, Rutherford model, nucleons.

Prerequisite: [Par 1.2]

PHY253	SIMULAT._USING_MATHEMATICA_253				
NAS_PHY	n a	English	0 + 1	K1	6

Introduction to programming in ”Mathematica”: Concept of an algorithm and the basic logic of a computer programme. Basics of “Mathematica” language and syntax. Symbolic manipulations with “Mathematica”. Graphics with “Mathematica”. “Mathematica” as a tool for numerical computations.

Applications: Selected illustrative examples from Mathematics, Physics, Chemistry, Biology and Economics.

Prerequisites: [PHY171] and [WTW211 #] and [WTW218 #]

PHY254	GENERAL_PHYSICS_254				
NAS_PHY	n a	English	4 + 2	S1	24

Vibrating systems & Waves (12 lectures)

Simple harmonic motion (SHM). Superposition (different frequencies, equal frequencies). Perpendicular vibrations (Lissajous figures). Damped SHM. Forced oscillations. Resonance. Q-value. Fourier analysis. Transverse wave motion. Plane wave solution using method of separation of variables. Reflection and transmission at a boundary. Normal & eigenmodes. Wave groups. Group velocity.

Modern Physics (30 lectures)

Special Relativity: Galilean & Lorentz transformations. Postulates. Momentum and energy. 4 vectors & tensors. General relativity.Quantum physics. Failure of classical physics. Bohr model. Particle-Wave duality. Schrödinger equations. Piece-wise constant potentials. Tunneling. Hydrogen atom. Angular momentum. Spin. X-rays. Laser.Nuclear physics: Fission. Fusion. Radioactivity.

Heat & Thermodynamics (14 lectures)

Heat. First Law. Kinetic theory of gases. Mean free path. Ideal, Clausius, Van der Waals and virial gases. Entropy. Second Law. Engines & refrigerators. Third Law. Thermodynamic potentials: Enthalpy Helmholtz & Gibbs Free energies, Chemical

potential. Legendre transformations (Maxwell relations). Phase equilibrium. Gibbs phase rule.
Prerequisites: [PHY171] and [PHY253 #] and [WTW211 #] and [WTW218 #]

PHY263	**GENERAL_PHYSICS_263**				
NAS_PHY	n a	English	4 + 2	S2	24

Classical Mechanics (28 lectures)
Mechanics of deformable matter: Fluids. Pascal's Law. Archimedes' Law. Bernoulli equation. Elasticity. Bulk & Young's modulus. Shear. Fundamental concepts: Space & time. Newton's Laws. One-dimensional Motion. Conservative forces. Conservation of energy. Motion near equilibrium. Collision problems. Energy & Angular Momentum: Energy. Conservative forces. Torque, angular momentum. Central forces. Hamilton's principle & Lagrange's equations.Central Conservative Forces: Conservation Laws. Inverse square force. Orbits equation. Scattering cross sections. Impact parameter. Rotating Frames: Angular velocity. Rate of change of a vector. Apparent gravity. Coriolis force. Precession of elliptic orbit around centre of force. Two Body problem: Centre-of-mass & relative coordinates - also Lagrange equations. The centre-of-mass frame (P, J and T). Many Body Systems: Momentum & centre of mass (CM) motion. Angular momentum & moments of internal forces. Kinetic & Potential Energy. Lagrange equations in CM & relative coordinates.
Physical Optics (14 lectures)
Electromagnetic Theory: Maxwell equations - simplified form for uniform transverse fields. Wave equation & plane-wave solutions. Electromagnetic character of light. Spherical waves. Waves at an interface: Fresnel equations. Evanescent waves. Conducting media. Complex index or refraction. Polarization: Law of Malus. Jones vectors & matrices. Crystal Optics: Dielectric tensor. Index ellipsoid & surfaces. Characteristic waves. Uniaxial crystals.Interference: Superposition of vector fields, wave-front splitting, amplitude splitting. Thin-film stacks - matrix methods. Diffraction: Huygens principle. Fraunhofer approximation. Single & double slit. Diffraction grating.
Physics of Materials (14 lectures)
Classification of materials. Atomic bonding. Crystallography. Point defects and diffusion. Line defects. Material strength. Phase diagrammes. Ceramics. Polymers. Composites. Fracture. Electrical properties. Semiconductors. Surface physics. Smart materials. Nanotechnology.
Prerequisites: [PHY253 GS] and [PHY254 GS] and [WTW211 GS] and [WTW218 GS] and [WTW220 #] and [WTW221 #]

PHY353	**PHYSICS_PROJECT_353**				
NAS_PHY	n a	English	0 + 3	S1	12

A student is required to complete a project under guidance of the lecturer. The nature of the project is determined jointly by the student, lecturer and the Head of Department. Requirement: Admission only with the approval of the Head of Department and lecturer involved. Cannot be used as substitute for other Physics 300 modules to obtain admission to the BSc(Hons) in Physics.
Prerequisite: [TDH]

PHY354	**ELECTRONICS_&_ELECTROMAGN._354**				
NAS_PHY	PHY361	English	4 + 2	K1	18

Electronics
Electronic Circuits: Thévenin & Norton equivalent circuits, superposition principle, RC, LC & LRC circuits. Semiconductor diode. Bipolar transitor. Operational amplifiers.

Electromagnetism
Electrostatics: Coulomb's law, divergence and curl of E, Gauss' law, Laplace's equation, image charge problems, multipole expansion. *Magnetostatics*: Lorenz force, Biot-Savart law, divergence and curl of magnetic field, Ampère's law, magnetic vector potential, multipole expansion, boundary conditions. *Electrodynamics*: Electromotive force, electromagnetic induction, Maxwell's equations, wave equation. *Electric & magnetic fields in matter*: Polarization, electric displacement & Gauss's law in dielectrics, linear dielectrics. Magnetization (diamagnets, paramagnets, ferromagnets), auxiliary field H & Ampère's law in magnetized materials, linear and nonlinear media.
Prerequisites: [PHY254 GS] and [WTW218 GS]

PHY355	**QUANTUM_MECHAN.&_MODELLING_355**				
NAS_PHY	PHY351	English	4 + 2	K2	18

Quantum Mechanics *The mathematical and conceptual basis of Wave Mechanics*: de Broglie hypothesis and the de Broglie atom, Fourier series and transforms, basis vectors in function spaces, delta function, wave packets, statistical interpretation, Schrödinger equation, Heisenberg uncertainty principle. Operators, eigenequations. *One-dimensional applications*: free particle, potential wells and barriers. Eigenvalues obtained through operator methods, harmonic oscillator. *Three dimensional applications*: Schrödinger equation in cartesian and spherical coordinates, angular momentum eigenvalues, 3D box, 3D oscillator spectrum, hydrogen atom. Matrix methods and spin.
Physics Modelling (Assessment will be done through a portfolio of project reports) Physics applications using basic statistical methods in physics modelling: random walks, Monte Carlo methods. Deterministic chaos: logistic map, Liapunov exponents. Chaos in continuous dynamical systems: Poincare maps.
Prerequisites: [PHY253 GS] and [PHY254 GS] and [PHY263 GS] and [WTW221 GS]

PHY363	**PHYSICS_PROJECT_363**				
NAS_PHY	n a	English	0 + 3	S2	12

A student is required to complete a project under guidance of the lecturer. The nature of the project is determined jointly by the student, lecturer and the Head of Department. Requirement: Admission only with the approval of the Head of Department and lecturer. Cannot be used as substitute for other Physics 300 courses to obtain admission to the BSc(Hons) in Physics.
Prerequisite: [TDH]

PHY364	**GENERAL_PHYSICS_364**				
NAS_PHY	PHY362 & PHY352	English	4 + 2	S2	36

Statistical Mechanics (32 lectures) *Isolated systems in thermodynamical equilibrium*. Systems in equilibrium with a heat bath: the canonical ensemble, Gibbs' entropic formula, classical statistical mechanics, energy equipartition theorem, heat capacity of classical ideal gases, heat capacity of solids. Einstein's model. Debye's model, black body radiation, paramagnetism. *The classical limit of perfect gases*: Gibbs paradox and the non-distinguishable character of quantum particles, Sackur-Tetrode entropic formula, the equation of state of the classical ideal gas. *Quantum perfect gases*: the grand canonical ensemble, Fermi-Dirac distribution, the free electron gas in metals, the Bose-Einstein distribution, Bose-Einstein condensation.
Solid State Physics (24 lectures) *Crystallography*: waves in crystals, diffraction. *Thermal lattice vibrations*: the Debye model. Phonons in non-metals, thermal

conductivity, scattering mechanisms for phonons. *Free electrons in crystals*: free-electron theory and distribution of the electrons amongst the energy states. *Electrical conductivity and the band theory*: scattering mechanisms. *Semiconductors*: effective mass, doping and Fermi levels. *Physics of the p-n junction*: applications, low dimensional systems, heterojunctions. *Magnetism*: Paramagnetism, susceptibility, L-S coupling and Hund's rules, Curie's law. Ferromagnetism, hysteresis. Antiferromagnetism. Ferrimagnetism. *Dielectric properties*: microscopic theory of the dielectric constant, piezoelectricity, dielectric breakdown. *Superconductivity*: Meissner effect, origin of superconductivity, isotope effect.
Physics Modelling (Assessment will be done through a portfolio of project reports) Modelling of physical systems. Biologically inspired computational methods. Selected illustrations of modelling in other fields.
Prerequisites: [PHY253 GS] and [PHY254 GS] and [PHY263 GS] and [PHY354 GS] and [PHY355 GS] and [WTW221 GS]

PLG251	**INTRODUCT._CROP_PROTECTION_251**				
NAS_MBY	PLG220	Bilingual	2 + 1	S1	12

Development and importance of crop protection. Basic principles in crop protection i.e. epidemic development of disease and insect pest populations, ecology of plant diseases and abiotic factors that affect plant health i.e. environmental pollution and pesticides, nutrient deficiencies and extreme environmental conditions. Ecological aspects of plant diseases, pest outbreaks and weed invasion. Important agricultural pests and weeds. Life cycles of typical disease causing organisms. Basic principles of integrated pest and disease management.

PLG262	**PRINCIPLES_OF_PLANT_PATHOL.262**				
NAS_MBY	n a	Double	2 + 1	S2	12

Fundamental principles of Plant Pathology. The concept of disease in plants. Causes of plant diseases. Stages in development of plant diseases. Disease cycles. Diagnosis of plant diseases.
Prerequisite: [MBY161]

PLG351	**GENERAL_PLANT_PATHOLOGY_351**				
NAS_MBY	PLG220	Bilingual	2 + 1	S1	18

Principles and examples of of plant diseases and their socio-economic importance. Introductory aspects of Phytobacteriology and Plant Virology. Current trends in plant pathology such as biosecurity, sanitory and phytosanitary issues of trade. Risk assessment and international food safety standards. Global Information Systems to assess disease spread and impact of global warming. Supply chain analysis, postharvest technology and food trade aspects.
Prerequisites: [MBY161] and [MBY261] or [TDH]

PLG363	**PLANT_DISEASE_CONTROL_363**				
NAS_MBY	PLG421	Bilingual	2 + 1	S2	18

Principles of plant disease control. Non-chemical control including biological control, disease resistance, regulatory measures, cultivation practices, physical methods. Modern chemo-therapy: characteristics, mode of action and application of fungicides, bactericides and nematicides. Principles of integrated disease management.

PLG364	**HOST_PATHOGEN_INTERACTIONS_364**				
NAS_MBY	PLG351	Bilingual	2 + 1	S2	18
Includes fungal, bacterial and viral interactions. Focuses on molecular and cellular events occurring during recognition, during fungal evasion of the host's defence mechanisms and during disease symptom development. Topics discussed will also include cell biology of interactions, systemic acquired resistance and the role of pathogenesis related proteins and toxins in pathogenesis. Basic aspects of plant disease epidemiological theory and concepts. Introduction to equipment and techniques used in epidemiological research as well as practical applications of epidemiology in plant disease management.					
PLG461	**NURSERY_&_SEED_PATHOLOGY_461**				
NAS_MBY	PLG422	Bilingual	1 + 0.5	S2	10
Principles of disease control in nurseries. Quality assessment of nurseries. Chemical and non chemical control measures will be discussed including disinfection of soil and growth media. Plant improvement schemes, production of disease free plant material and indexing of mother material for plant pathogens. Seed pathology: principles, detection and control of seed borne diseases.					
PLG462	**RESEARCH_PROJECT_462**				
NAS_MBY	MBY401	Bilingual	1 + 1	J1	20
A practical research project of limited extent under the supervision of one of the lecturers in Plant Pathology within the Department. Any topic in Plant Pathology can be selected.					
PPF400	**PROFESSIONAL_PORTFOLIO_400**				
OPV_OPV	n a	Bilingual		J1	12
End of first semester: progress assessment and feedback. End of the academic year: submission of a prepared professional portfolio as a valid and reliable scientific proof of learning, integrating all modules. Present and defend the professional portfolio to a panel of examiners for final evaluation.					
PPK251	**SUSTAINABLE_PRODUCTION_SYS.251**				
NAS_PGW	PPK210	Bilingual	2 + 0.5	S1	12
Sustainability in plant production. Principles and practices of monoculture, crop rotation, ley cropping and intercropping systems. Organic farming. Precision farming. Concepts such as target yield, maximum economic yield and the farming systems approach. Principles of soil cultivation and conservation. **Prerequisite:** [BOT161]					
PSZ311	**ROCK_MECHANICS_311**				
ING_ING	n a	English	3 + 1	S2	16
Stress and strain in solid materials. Elasticity. Strength and failure modes of rock material and rock failure criteria. The characteristics of joints in rock. Collection of joint information and interpretation thereof. The characteristics of a rock mass, classification methods and determination of strength. Rock failure due to gravity. Slope stability, joint failure, wedge failure, circular and non-circular failure in surface mines. **Prerequisite:** [SWK210]					

PVK420	**POULTRY_SCIENCE_420**				
NAS_VKU	n a	Afrikaans	2 + 0.5	S1	12
Industrial science and management of production systems and feeding systems in poultry production units. Applied breeding of poultry. Design and utilization of equipment and housing facilities. Product quality and marketing of poultry products. Hygiene and health programmes. **Prerequisites:** [LEK210] and [VGE301] and [VKU220]					
RPL310	**REPRODUCTION_SCIENCE_310**				
NAS_VKU	n a	Bilingual	1 + 0.5	S1	8
Theriogenology, spermatogenesis, zoogenesis, the female sexual cycle. Species differences. Hormonal control of the sexual functions. **Prerequisite:** [DAF200]					
RPL320	**REPRODUCTION_SCIENCE_320**				
NAS_VKU	n a	Bilingual	2 + 0.5	S2	10
Artificial insemination. Semen collection techniques, the evaluation, dilution and conservation of semen. Collection, conservation and transfer of embryos. Collection of ova and in vitro fertilization. Handling of apparatus and practical insemination, oestrus observation and determination of gestation. **Prerequisite:** [RPL310]					
SCE171	**RELIGIOUS_INSTRUCTION_171**				
NAS_SCE	n a	English	2 + 0	S1	8
Prominent religions in South Africa, world views associated with these religions, the cultural role of religions, importance of holy days. Mysticism and the occult.					
SCE201	**SCIENCE_EDUCATION_201**				
NAS_SCE	n a	English	2 + 0	J1	16
An introduction to patterns of scientific thinking. An introduction to science and science literacy. Ethics of science. Using the scientific method to encourage discovery learning. Exploring the concept of knowledge. The Learning Cycle. Principles of curriculum design.					
SCE303	**SCIENCE_EDUCATION_303**				
NAS_SCE	n a	English	2 + 1	J1	36
Understanding the application of OBE in the teaching of science. The infusion of scientific thinking into the science curriculum in a developmentally appropriate way. The design of learning programmes by programme organisers at school level. Macro planning in the natural science learning area. Provincial and national models of assessment. The assessment and implementation of learning programmes. The assessment of learner progress in the context of specific science learning programmes. Introduction to the principles of discipline and motivation. Some aspects of school guidance and career planning. Practical: Practical experience with learning opportunities. Use of computers as a teaching aid. **Prerequisite:** [CIL111 GS]					
SCI154	**EXPLORING_THE_UNIVERSE_154**				
NAS_SCI	n a	English	4 + 0	S1	16
This module is presented in English only. Students from all faculties are welcome to					

join us in our exploration of the universe from an earth-bound perspective. We reflect on the whole universe from the sub microscopic to the vast macroscopic and mankind's modest position therein. To what degree is our happiness determined by stars? Echoes from ancient firmaments - the astronomy of old civilisations. The universe is born with a bang. Stars, milky ways and planets are formed. Life is breathed into the landscape on earth, but is there life elsewhere? The architecture of the universe – distance measurements, structure of our solar system and systems of stars. How does it look on neighbouring planets? Comets and meteorites. Life cycles of stars. Spectacular exploding stars! Exotica like pulsars and black holes. The content of this course is the same as SCI164 and students are not allowed to register for both SCI154 and SCI164.					
SCI164	**EXPLORING_THE_UNIVERSE_164**				
NAS_SCI	n a	Afrikaans	4 + 0	S2	16
This module is presented in Afrikaans only. See SCI154 for a summary of the course content. The content of this module is the same as SCI154 and students are not allowed to register for both SCI154 and SCI164.					
SEM381	**SEMINAR_381**				
NAS_VBR	n a	Double	1 + 0	S2	5
Introduction to research methodology. The compilation of a well structured literature review. **Prerequisite/s**: [Third year status]					
SGM311	**SOIL_MECHANICS_311**				
Ing_ING	n a	Bilingual	3 + 1	S1	16
Introduction to soil mechanics. Introduction to clay mineralogy. Mass- volume relationships and phases of soil. Groundwater flow and permeability. Effective stress principle. Suction pressures in saturated as well as partially saturated soil. The Mohr circle and stresses at a point. The Mohr-Coulomb strength theory and the stress-strain properties of soil. The Boussinesq theory. Consolidation theory and soil settlement.					
SLK110	**PSYCHOLOGY_110**				
GW_SLK	SLK151 + SLK 154	Bilingual	2 + 0	S1	12
(Also includes 1 tutorial per week) Psychology 110 This module is an orientation to Psychology with a focus on major personality theories. An introduction is given to various paradigmatic approaches in Psychology and the development of psychology as a science is discussed.					
SLK120	**PSYCHOLOGY_120**				
GW_SLK	n a	Bilingual	2 + 0	S2	12
(Also includes 1 tutorial per week) This module introduces the student to a basic knowledge and understanding of the biological bases of human behaviour. The module addresses the key concepts and terminology related to the biological subsystem, the rules and principles guiding biological psychology, and identification of the interrelatedness of different biological systems and subsystems. This module also examines various cognitive processes, including perception, memory, thinking, intelligence and creativity. Illustrations are given of various thinking processes, such as problem solving, critical, analytic and integrative thinking					

SLK210	PSYCHOLOGY_210				
GW_SLK	SLK 252 + SLK 253	Bilingual	2 + 0	S1	20
(Also includes 1 tutorial per week) In this module human development from conception through adolescence to adulthood is discussed with reference to various psychological theories. Incorporated are the developmental changes related to cognitive, physical, emotional and social functioning of the individual and the context of work in adulthood. Traditional and contemporary theories of human development explaining and describing these stages are studied in order to address the key issues related to both childhood and adulthood.					
SLK220	**PSYCHOLOGY_220**				
GW_SLK	SLK254	Bilingual	2 + 0	S2	20
(Also includes 1 tutorial per week) This module is a social-psychological perspective on interpersonal and group processes. Themes that are covered include communication, pro-social behaviour, social influence and persuasion, political transformation, violence, and group behaviour.					
SLK310	**PSYCHOLOGY_310**				
GW_SLK	SLK352 + SLK362	Bilingual	2 + 0	S1	30
(Also includes 1 tutorial per week) Identification of abnormal behaviour in children based on knowledge of normal childhood development; introduction to the study of various models pertaining to abnormal behaviour; understanding and application of basic concepts in child psychopathology. This module also provides an introduction to psychopathology and symptomatology of adult abnormal behaviour. Terminology, definitions of abnormal behaviour, problems in diagnosis, labelling, and myths regarding abnormal behaviour are discussed. Neurosis as a specific mental disorder is studied critically from a multi-dimensional perspective, including intrapsychic, interpersonal and social-cultural explanations.					
SLK320	**PSYCHOLOGY_320**				
GW_SLK	SLK351 + SLK353	Bilingual	2 + 0	S2	30
(Also includes 1 tutorial per week) This module deals with a community psychological perspective on human behaviour and psychological interventions and also critically explores the contribution of various perspectives in Psychology. The module focuses on themes such as definitions of key concepts, principles and aims of community psychology, and the role of the community psychologist as well as the impact of earlier thought frameworks on contemporary perspectives. The implications of these ideas for practical initiatives focussed on mental health in communities, is discussed.					
SOC210	**SOCIOLOGY_210**				
GW_SOC	n a	English	3 + 0	S1	20
Sociology 210 (SOC 259 + SOC 261) Includes 1 tutorial. Section 1: Social change, development and globalisation: The study of societal change and development is fundamental to sociological analysis. Moreover the contemporary process of globalisation at a world level impacts on the process of change. This section will review some classical and contemporary debates on issues such as 'progress', modernisation, 'development and underdevelopment', 'dependency', 'post-development' and globalisation. Section 2: Households, family and gender: This section focuses on theories and issues relevant to the understanding of gender, households and family life					

at a general level but with a particular emphasis on the Southern African context. The section will address issues such as poverty, survival strategies of rural and urban households, domestic violence and its effects on family life.					
STK110	**STATISTICS_110**				
EB_WST	n a	Double	3 + 1	S1	13
Descriptive Statistics – Univariate: Sampling and the collection of data, frequency distributions and graphical representations. Descriptive measures of location and dispersion. *Probability and inference*: Introductory probability theory and theoretical distributions. Sampling distributions. Estimation theory and hypothesis testing of sampling averages and proportions (one and two sample cases). Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. This module is also presented as an anti-semester bilingual module. **Prerequisite:** [Par 1.2]					
STK113	**STATISTICS_113**				
EB_WST	n a	Double	3 + 1	S1	11.5
Data operations and transformations: Introductory concepts: The role of statistics, various types of data and the number system. Concepts underlying linear, quadratic, exponential, hyperbolic, logarithmic transformations of quantitative data: Graphical representations, solving of equations, interpretations. Determining linear equations in practical situations. Characteristics of logarithmic functions. The relationship between the exponential and logarithmic functions in economic and related problems. Systems of equations in equilibrium. Additional concepts relating to data processing: functions and inverse functions, sigma notation, factorial notation, sequences and series, inequalities (strong, weak, absolute, conditional, double) and absolute values. *Descriptive statistics – Univariate*: Sampling and the collection of data, frequency distributions and graphical representations. Descriptive measures of location and dispersion. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. The weekly one hour practical is presented during the last seven weeks of the semester. This module is also presented as an anti-semester bilingual module. Prerequisite: None					
STK120	**STATISTICS_120**				
EB_WST	n a	Double	3 + 1	S2	13
Multivariate statistics: Analysis of variance, categorical data analysis, distribution-free methods, curve fitting, regression and correlation, the analysis of time series and indices. *Statistical and economical applications of quantitative techniques*: Systems of linear equations: Drafting, matrices, solving and application. Optimisation: Linear functions (two and more independent variables), non-linear functions (one and two independent variables). Marginal- and total functions. Stochastic and deterministic variables in statistical and economical context: producers' surplus, consumers' surplus, distribution functions, probability distributions and probability density functions. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. This module is also presented as an anti-semester bilingual module. **Prerequisite:** [STK110 GS]					
STK123	**STATISTICS_123**				
EB_WST	n a	Double	3 + 1	S2	11.5
Optimisation techniques with economic applications: Data transformations and					

relationships with economic applications: operations and rules, linear, quadratic, exponential, hyperbolic and logarithmic functions, systems of equations in equilibrium, system of linear inequalities, solving of linear programming problems by means of the graphical and extreme point methods. Applications of differentiation and integration in statistic and economic related problems: the limit of a function, continuity, rate of change, the derivative of a function, differentiation rules, higher order derivatives, optimisation techniques, the area under a curve and applications of definite integrals. *Probability and inference*: Introductory probability theory and theoretical distributions. Sampling distributions. Estimation theory and hypothesis testing of sampling averages and proportions (one- and two-sample cases). Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. The weekly one hour practical is presented during the last seven weeks of the semester. This module is also presented as an anti-semester bilingual module. **Prerequisite:** [STK113 GS]					
STK210	**STATISTICS_210**				
EB_WST	n a	Double	3 + 1	S1	20
Probability theory. Univariate probability distributions, expected values and moments. Special probability distributions: Binomial, hypergeometric, poison, exponential, gamma, beta and normal distribution. Probability distributions and moments in the bivariate case. The bivariate normal distribution. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. This module is also presented as an anti-semester bilingual module. **Prerequisites:** [STK110] and [STK120]					
STK281	**STATISTICS_281**				
EB_WST	n a	English	2 + 1	S2	10
Applied regression analysis: Simple and multiple regression, non-linear regression, correlation, the use of dummy variables, heteroscedasticity, serial correlation and lag structures. Applied time series analysis. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. **Prerequisites:** [STK110] and [STK120]					
SUR220	**SURVEYING_220**				
EB_GGY	n a	Double	3 + 1	S2	16
Definition of Surveying. Adjustment and use of the following instruments: Level, compass and theodolite. Site surveying, levelling and tacheometry. Co-ordinate systems, angles of direction, joins and polars. Point positioning. Trigonometric height determination. **Prerequisite:** [WTW114 GS]					
SWK122	**MECHANICS_122**				
ING_ING	n a	Bilingual	4 + 0	S2	16
Equivalent force systems, resultants. Newton's laws, units. Forces acting on particles. Rigid bodies: principle of transmissibility, resultant of parallel forces. Vector moments and scalar moments. Relationship between scalar- and vector moments. Couples. Equivalent force systems on rigid bodies. Resultants of forces on rigid bodies. Equilibrium in two and three dimensions. Hooke's law. Trusses and frameworks. Centroids and second moments of area. Hydrostatics: pressure at a point, resultant forces on submerged plane areas. Beams: distributed forces, shear force, bending moment, method of sections, relationship between load, shear force and bending moment. **Prerequisite:** [WTW158 or WTW114]					

SWK210	STRENGTH_OF_MATERIALS_210				
ING_ING	n a	Bilingual	3 + 2	S1	16
Stresses, strains and material behaviour: Normal and shear stresses, factors and safety. Bar structures with axial loads: Displacements and stresses of statically determinate and indeterminate structures, thermal effects, transformation of stress, strain energy, dynamic loads. Torsion: Torsion of round bars, transformation of shear stress, relationship between E, G, y, transmission of power, statically indeterminate axles, strain energy. Shear and bending of beams: Shear force and bending moment, strains and stresses. Analysis of stress and strain: Plane stress, tri-axial stress, 3-D stress, plane strain. Deflections of beams. Buckling. **Prerequisites:** [SWK122] and [WTW128 # or WTW158#]					
TBE151	**TOURISM_MANAGEMENT_151**				
EB_TBE	n a	Bilingual	4 + 0	K1	5
Structure and organisation of the tourism industry: This introductory module provides an introduction to and overview of the tourism industry. Firstly definitions and concepts are explored, whereafter the evolution of tourism through the ages is addressed. With a sound frame of reference in place, the structure and organisation of tourism at the international, national, provincial and private sector levels, is examined.					
TBE152	**TOURISM_MANAGEMENT_152**				
EB_TBE	n a	Bilingual	4 + 0	K2	5
The tourism system and the key components of tourism: This module provides various perspectives on the tourism system and then focuses on the specific components of the tourism system, their relationships and their interdependence. Specific attention is placed on key components such as attractions, transportation, distribution channels, hospitality and related services.					
TBE161	**TOURISM_MANAGEMENT_161**				
EB_TBE	n a	Bilingual	4 + 0	K3	5
Tourism demand, consumer behaviour and market research: As the consumer is central to success in the tourism industry, this module addresses tourism demand from both a quantitative and a qualitative perspective. An understanding is provided of tourist behaviour; cultural and international aspects of travel as well as the sociology of tourism. The latter part of this module focuses on the key role of travel and tourism research, particularly the application of research techniques and the interpretation of research results as an aid in tourism planning and decision-making.					
TBE162	**TOURISM_MANAGEMENT_162**				
EB_TBE	n a	Bilingual	4 + 0	K4	5
Tourism supply, planning and development: This module focuses on supply side activities and services that need to be addressed to ensure quality visitor experiences. Particular attention is given to the formulation and implementation of sustainable tourism planning, development and management principles and practices.					
TBE261	**TOURISM_MANAGEMENT_261**				
EB_TBE	n a	Bilingual	4 + 0	K3	8
The management of tourism attractions: In this module the aspect of visitor attractions, which is at the core of successful tourism, will be addressed at three levels. Firstly, the key role of visitor attractions in the tourism industry will be outlined, whereafter the					

overall development process (feasibility studies, financial and design aspects, etc.) relating to visitor attractions will receive attention. The last part of this module focuses on the strategic management and operational aspects of visitor attractions.					
TBE262	**TOURISM_MANAGEMENT_262**				
EB_TBE	n a	Bilingual	4 + 0	K4	8
Strategic destination marketing: This module firstly explores the unique characteristics of and approaches to strategic destination marketing, with particular emphasis on global best practices in this regard. It then provides a management and operational framework for destination marketing. Within this framework new developments, trends, practices and case studies in destination marketing are also addressed.					
TBE310	**TOURISM_MANAGEMENT_310**				
EB_TBE	n a	Double	4 + 0	S1	20
Hospitality management 1: Rooms division and front office management: This section covers the "guest cycle" and addresses the process and procedures, from the moment a potential guest contacts an accommodation establishment to the time that he or she departs. All the operational and management functions of this process as well as key supportive aspects such as hospitality, social skills and customer care are covered in detail. A distinction is drawn between revenue centres and support centres. All the key support centres such as housekeeping, maintenance and security are covered. This section concludes with a well-rounded overview of the operational and management aspects of the front office and its support units. Hospitality management 2: Food and beverage and financial management. This section firstly covers the key operational and management aspects of food and beverage management, which forms a vital part of hospitality management. Industry exposure and practical involvement is an essential ingredient of this section. As financial management and costing is critical to the success of any hospitality organisation, the second part of this section covers all the policies, principles and procedures pertaining to financial operations and financial management in such establishments.					
TKS212	**TXS:UTILITY,FIBRES_&_YARNS_212**				
NAS_VBR	TKS210	Double	3 + 1	S1	14
Utility aspects: basic components of textiles, consumer decision making, utility aspects that include durability, comfort, maintenance, health/safety/protection and aesthetic aspects. Fibres and yarns: Fibre structure and performance including textile chemistry, fibre morphology and formation, fibre properties, classification and identification. Yarn structure and performance (including spun yarns, filament yarns, compound and novelty yarns)					
TKS222	**TXT:STRUCTURES_&_FINISHES_222**				
NAS_VBR	TKS220	Double	3 + 1	S2	14
Fabric structures: Introduction to fabric structures. Woven fabrics, knits, non-woven fabrics and compound fabrics. Finishes and dying processes: Introduction to fabric finishing. Preparatory and final finishes. Finishes for special end-uses: durability, comfort and protection; ease of maintenance; aesthetic appeal. Dyed and printed fabrics. **Prerequisite:** [TKS212 GS]					

TKS310	NEW_DEV.&_TEXTILES_IN_USE_310				
NAS_VBR	TKS362	Double	2 + 0	S1	10
New developments (apparel textiles). Textile product use and assessment of performance during use and care. **Prerequisites:** [TKS212] and [TKS222 GS]					
TKS421	**TEXTILES_421**				
NAS_VBR	TKS420	Double	3 + 0	S2	15
Clothing textiles and textile products from a marketing and consumer perspective. Practical project: Project to assess performance properties of textiles for specific end-use by using laboratory tests. A written report of the results is also required. **Prerequisites:** [TKS212] and [TKS222] and [TKS310]					
TLR320	**ANIMAL_BREEDING_320**				
NAS_VKU	n a	Bilingual	2 + 0.5	S2	10
Karyotyping of farm animals; breed and specie differences and the influence on classification of breeds. Influence of chromosomal aberrations. Phenotypic expression of genes and gene-interaction in farm animals. Single gene, major genes and polygenes. Variation in traits of economic importance and statistical description. Use of genetic variation. Estimation of breeding values and family indices on traits determined by single genes. Principles of breeding systems. **Prerequisite:** [GTS261]					
TLR411	**ANIMAL_BREEDING_411**				
NAS_VKU	n a	Afrikaans	2 + 0.5	S1	12
Components of animal performance. Sources of variation, population parameters and the estimation thereof. Introduction to matrix algebra for application in animal breeding. Selection indices theory. Statistical models in estimation of breeding values. Application of breeding values and prerequisites for accuracy. Breeding and selection for reproduction and growth. Principles of QTLs. **Prerequisite:** [TLR320]					
TLR420	**ANIMAL_BREEDING_420**				
NAS_VKU	n a	Bilingual	2 + 0.5	S2	12
Formulation and application of breeding objectives. Animal recording systems and international guidelines for evaluation. Specie- specific breeding systems. Traits of economic impotence and the efficiency thereoff. Crossbreeding systems in meat producing farm animals. Breed development. **Prerequisite:** [TLR411]					
VAP300	**VET.ANATOMY_&_PHYSIOLOGY_300**				
VET_ANA	n a	English	10 + 2	J1	72
Veterinary Anatomy, physiology, histology and embryology of the skin, locomotor system, nervous system, cardiovascular system, respiratory system, digestive system and urogenital system of the domestic animals. The dog is used as model for anatomy. Topographical anatomy of the dog. **Prerequisite:** [Only students selected for BSc(Veterinary Biology)III]					

VBF411	**CONSUMER_FACILITATION_411**				
NAS_VBR	VBF410	Double	2 + 0	S1	10
Consumer decision making through the family life cycle; determinants of consumer satisfaction. Consumer education; development of consumer skills; less privileged consumers. Expenditure patterns of the diverse SA consumer market. Consumerism. Globalisation.					
VBM400	**SUBJ_DID:_BUSINESS_MANGEM._400**				
OPV_CUR	n a	Bilingual	2 + 1	J1	24
Basic principles of community nutrition. Nutritional assessment. Nutrition problems and programmes in South African communities.					
VDB321	**FOOD_SERVICE_MANAGEMENT_321**				
NAS_VBR	VDB361,362	Double	3 + 0.5	S2	18
Planning and layout of food service units for different food service systems. Equipment for food services. Factors influencing the choice and purchasing of equipment for different food service units. Hygiene and safety in food services. Principles of management as applied to food service systems. Human Resource Management in food service systems. Financial management in food services. **Prerequisite:** [VDS322 #]					
VDB410	**FOOD_SERVICE_MANAGEMENT_410**				
NAS_VBR	VDB451,452	Double	3 + 1	S1	24
The professional food service manager's roles, responsibilities and characteristics. Contemporary leadership and management styles in food service systems. Professionalism and ethics. Advanced food service systems and production management techniques. Marketing of food services. **Prerequisites:** [ABV320] and [VDB321 GS]					
VDG220	**NUTRITION_220**				
NAS_VBR	n a	Double	3 + 0	S2	12
Integration of natural science concepts basic to the study of human nutrition. Cell and tissue; energy metabolism and balance; body temperature; cardiovascular system; kidneys and acid-base equilibrium.					
VDG250	**NUTRITION_250**				
NAS_VKU	n a	English	3 + 0.5	S1	12
Nutrition in the context of growth, development and composition of organisms. Metabolic processes and control in the body. Overview of nutritional processes. The study of the fundamental principles of nutrient metabolism (including macro- and micro-nutrients and water) and digestion physiology. Applications are made regarding man and animals. Practical work: Experimental work and problem orientated tasks. **Prerequisite:** [CMY127]					
VDG311	**NUTRITION_311**				
NAS_VBR	VDG310	Double	3 + 1	S1	17
The study of nutrients and water regarding their chemical composition, characteristics, basic digestion, absorption, metabolism, functions, food sources and symptoms of deficiency and toxicity. Energy metabolism. Dietary recommendations and guidelines,					

dietary guides and meal planning. The use and application of food composition tables in dietary analysis. **Prerequisites:** [FSG110] and [FSG120] or [VDG220]					
VDG321	**NUTRIT._DURING_LIFE_CYCLE_321**				
NAS_VBR	VDG320	Double	3 + 1	S2	17
The role of nutrition in the life cycle. The role of nutrition in the prevention of lifestyle related diseases - osteoporosis, cancer, coronary heart disease, tooth decay. Vegetarianism. Different conditions of malnutrition: Protein Energy Malnutrition and obesity. **Prerequisite:** [VDG311]					
VDS111	**FOOD_SUPPLY_&QUALITY_CONTR.111**				
NAS_VBR	VDS110	Double	2 + 1	S1	10
Basic food preparation and food preparation techniques. Weighing and measurement techniques, equipment and terminology as applied in food preparation. Basic food quality control.					
VDS210	**FOODS_210**				
NAS_VBR	n a	Double	3 + 1	S1	18
The study of different food systems with regard to food preparation. Physical and chemical properties and the influence of the composition in food preparation. Food preparation basics of the following: soups and sauces; fruit and vegetables; salads; frozen desserts; gelatine. **Prerequisite:** [VDS111]					
VDS221	**FOODS_221**				
NAS_VBR	n a	Double	3 + 1	S2	18
The study of different food systems with regard to food preparation. Physical and chemical properties and the influence of the composition in food preparation. Food preparation basics of the following: meat; poultry; fish, legumes, eggs and milk, starches and cereals; baked products (whole spectrum); leavening agents. **Prerequisite:** [VDS210]					
VDS310	**FOODS_310**				
NAS_VBR	VDS351,352	Double	3 + 1	S1	21
Planning executing and reporting consumer food research. Food preservation and evaluation techniques. Experiments in food, emphasizing ingredient function and standard preparation methods. Application of experimental methods through which the chemical and physical reactions of food to different food handling, preparation and preservation techniques are illustrated. Quality evaluation and consumer orientated sensory evaluation of food products. **Prerequisites:** [VDS210] and [VDS221]					
VDS322	**LARGE_SCALE_PLANNING&_PREP.322**				
NAS_VBR	VDS320	Double	3 + 3	S2	29
MODULE 1 AND PRACTICAL WORK: Principles of large-scale food preparation and the practical application thereof in a practical restaurant situation. Restaurant management. Recipe formats and adjustment applicable to large-scale food preparation. Work scheduling and the practical exposure to the use of large scale catering equipment in a real life situation. MODULE 2: Menu planning for different food					

service systems and styles of food service. MODULE 3: Large scale food procurement, consumption and storage. **Prerequisites:** [KEP261 or KEP220] and [VDS221]					
VDS354	**FOODS_354**				
NAS_VBR	n a	Double	3 + 0	K2	8
Principles of food safety and food hygiene. Consumer rights and protection.					
VDS355	**FOOD_&_BEVERAGE_MANAGEMENT_355**				
NAS_VBR	n a	Double	2 + 1	K1	6
Table setting, table serving, wine service, food and wine pairing, beverage management. **Prerequisites:** [VDS220] and [VDS221]					
VDS413	**FOODS_413**				
NAS_VBR	n a	Double	3 + 2	S1	30
Recipe development process. Development of appropriate recipes and food products for a given situation. Standardisation of recipes. Food styling and food photography. **Prerequisite:** [VDS310 or VDS322]					
VDS414	**CULINARY_ART_414**				
NAS_VBR	n a	Double	2 + 1	S1	19
Advanced food preparation and presentation techniques. **Prerequisites:** [VDS210] and [VDS221]					
VDS415	**VISUAL_MERCHANDIS.OF_FOODS_415**				
NAS_VBR	n a	Double	3 + 0	S2	15
Aspects of food retailing with special emphasis on food packaging and labelling of food products. Aspects of food retailing with regard to display, presentation and shop layout as applied to food products.					
VDS423	**FOODS_423**				
NAS_VBR	n a	Double	3 + 0	S1	15
Factors influencing food consumption, consumer behaviour and food choice. Food product advice. Consumer advice, marketing of food products, consumer education.					
VDS424	**CULINARY_ART_424**				
NAS_VBR	n a	Double	2 + 1	S2	19
Advanced food preparation and presentation techniques. Event planning and banqueting. **Prerequisites:** [VDS221] and [VDS322 #] and [VDS414]					
VDS425	**PROJECT_FOODS:VISUAL_MERCH.425**				
NAS_VBR	n a	Double	3 + 0	S2	15
Practical application of the principles in visual merchandising of food and food retailing in the food industry. **Prerequisites:** [VDS415] and [VDS423]					
VDS426	**FOOD_RESEARCH_PROJECT_426**				
NAS_VBR	n a	Double	1 + 2	S2	18
Planning, executing and reporting a research project in a food related field. **Prerequisites:** [PGB410 #] and [VDS310]					

VGE301	**NUTRITION_SCIENCE_301**				
NAS_VKU	n a	Bilingual	3 + 0.5	J1	32
Digestion and metabolism of feeds. The division of food energy and food energy systems. Protein quality and requirements. Mineral and vitamin requirements. Nutritional standards. Voluntary intake. Water quality. Characteristics of fodder. Rumen function and microbial fermentation. Practical work: In vivo and in vitro digestibility studies. **Prerequisites:** [BCM263 + BCM264] and [BCM265 + BCM266] and [DAF200] and [VDG250] and [VKU220]					
VGE411	**NUTRITION_SCIENCE_411**				
NAS_VKU	n a	Double	4 + 0.5	S2	18
Specialised nutrition of monogastric animals: poultry, pigs, horses and selected freshwater aquatic organisms. The use of computer systems in feeding management. **Prerequisite:** [VGE301]					
VGE421	**NUTRITION_SCIENCE_421**				
NAS_VKU	n a	English	3 + 0.5	S2	16
Specialized small stock and game nutrition. Nutrition of rams, ewes and lambs for optimal production. Principles of creep feeding, drought feeding, winter and supplementary feeding. Feeding pen nutrition and final nutritional preparation of lambs. Influence of nutrition on wood, pelts and Mohair. Fodder flow planning. Practical work: Formulation of lowest cost rations and practical work with ruminants. **Prerequisite:** [VGE301]					
VGE423	**NUTRITION_SCIENCE_423**				
NAS_VKU	n a	Double	3 + 0	S1	16
Specialized nutrition of beef and dairy cattle according to production systems. The use of computer systems in feeding management. The practicals will include compiling rations in terms of requirements and least cost formulations, specialised assignments and on-farm experiential training. **Prerequisite:** [VGE301]					
VHS400	**SUBJ.DID:_HOSPITALITY_STUD.400**				
OPV_CUR	n a	Bilingual	0 + 1	J1	24
The study field of Didactics: Hospitality studies. Examples of theme study from the secondary school syllabus for Grade 10, 11 & 12, the reduction of learning content, evaluation of the school subject. Principles of lesson design.					
VHT400	**SUBJ.DID:_COMSUMER_STUDIES_400**				
OPV_CUR	n a	Bilingual	+	J1	24
Subject Didactics of Consumer Studies 400 The nature and structure of the subject consumer studies. Basic principles, concepts and practices in consumer studies. Facilitating learning in consumer studies. Design and implementation of supportive learning material.					
VKD410	**PIG_SCIENCE_410**				
NAS_VKU	n a	Afrikaans	1 + 0.5	S2	8
Industrial science and management of pigs - sow, boar and growing pigs. Production systems and feeding systems. Design and utilization of housing facilities. Product					

quality and marketing. Hygiene and herd health programmes. **Prerequisites:** [VGE301] and [VKU220]					
VKF411	**ANIMAL_SCI.PHARMACOLOGY_411**				
NAS_VKU	n a	Afrikaans	3 + 0	S1	12
The pharmacology, laws, control and use of substances for animal production. **Prerequisites:** [DFS320] and [VGE301]					
VKK110	**VISUAL_COMMUNICATION_110**				
GW_GW	VKK155, VKK153	Double	3 + 0	S1	12
Introduction to visual culture studies; study of the form, content and aims of static and moving images in diverse media (e.g. advertising, music video). Introduction to terminology and modes of analysis in visual culture (e.g. formalism, feminism, Marxism, semiotics). Investigation of the relationship between popular culture and the mass-media. Interpretation of cultural icons such as the hero in relation to cultural codes, stereotypes and myths.					
VKU210	**ANIMAL_SCIENCE_210**				
NAS_VKU	n a	English	1 + 0.5	S1	6
An overview of the livestock industry. Livestock production regions and systems. Livestock species, breeds and products. Principles of livestock production. Practical work: The general care and handling of livestock. **Prerequisite:** [GTS161]					
VKU220	**ANIMAL_SCIENCE_220**				
NAS_VKU	n a	Bilingual	2 + 0.5	S2	12
Introduction to the basic principles and terminology of large stock, small stock, pig and poultry production systems. **Prerequisite:** [VKU210 GS] or [TDH]					
VKU222	**ANIMAL_SCIENCE_222**				
NAS_VKU	n a	Bilingual	2 + 0	S2	6
The chemical composition of fodder. Digestive processes and the digestibility of fodder. The nutrition and nutritional requirements of farm stock. Basic composition of rations. Intensive and extensive feeding.					
VKU320	**ANIMAL_SCIENCE_320**				
NAS_VKU	n a	Double	3 + 1	S2	12
Functional management of intensive and extensive beef, dairy, sheep and goat production systems. Discussions and literature studies on applied animal nutrition, breeding production planning and production processes. **Prerequisites:** [VKU210] and [VKU220] and [WDE310]					
VKU361	**ANIMAL_ECOLOGY_361**				
NAS_VKU	VNE310	Bilingual	2 + 0	S2	8
Animal ecology, interaction between genotype and environment. Animal-ecological factors which influence regional classification. Animal ecology factors which must be taken into consideration in the obtaining of the production factors, planning and management of the cattle farming enterprise. Conservation farming and adapted farming and management systems; environmental conservation. **Prerequisite:** [TDH]					

VKU362	**ANIMAL_SCI._BIOTECHNOLOGY_362**				
NAS_VKU	n a	Bilingual	1 + 0	S2	8
Application of biotechnology in farm animals with specific reference to reproductive biotechnology such as AI MOET and sex manipulation, which has an effect on genetic progress. Application of DNA-technology such as parentage verifications, identification of genetic defects, QTL's and MAS. **Prerequisite:** [GTS261]					
VKU411	**SEMINAR_411**				
NAS_VKU	n a	Double	1 + 0	S1	8
Literature studies and seminars in Animal Science. **Prerequisite:** [TDH]					
VKU412	**RESEARCH_METHODOLOGY_412**				
NAS_VKU	n a	Double	1 + 0	S1	8
Research methodology in Animal Science: Handling of queries, introduction to the problem, approach to problem solving, reporting. Practice. **Prerequisite:** [TDH]					
VSX420	**MEAT_AND_DAIRY_SCIENCE_420**				
NAS_VKU	n a	Afrikaans	2 + 0	S2	10
Meat industry. Meat species. Composition of carcass and meat, slaughtering process, meat quality, and the consumer. Dairy industry. Composition and nutritional value of milk and factors that influence it. Milk production, milk quality and distribution. **Prerequisite:** [DFS320]					
VVW350	**COM.NUTRITION_&PUBL.HEALTH_350**				
NAS_VDW	n a	Bilingual	3 + 1	S1	21
Theory and practice of community nutrition and public health (cap sel CNT411). Environmental health issues and health indicators in communities. **Prerequisites:** [HNT210] or [TDH] and [VDG250] and [VDG321]					
VVW363	**FOOD,_NUTRITION_AND_HEALTH_363**				
NAS_VDW	n a	Bilingual	3 + 1	S2	21
Scientific foundation of food and nutrition in health promotion and disease prevention. Principles of interpretation of nutritional assessment data. **Prerequisites:** [HNT210] or [TDH] and [VDG311] and [VDG321]					
VVW364	**FOOD_COMP.&_APPL_NUTR.PROG.364**				
NAS_VDW	n a	English	2 + 1	S2	18
Generation, interpretation and application of food composition data in nutrition programmes. Chemical composition of foods: sampling for food analysis, assessing methods of food analysis for inclusion in food composition data. Interpretation of food composition data. Nutritional labeling of food. Use of nutritional data in food formulations. Dietary supplementation, enrichment and fortification of foods. **Prerequisites:** [FST351] and [FST352] or [TDH]					
WDE310	**PRINCIPLES_OF_VELD_MANAGE_310**				
NAS_PGW	n a	Bilingual	2 + 0.5	S1	12
The influence of biotic and abiotic factors on the productivity of different strata and					

components of natural pastures. This will enable the student to advise users, with the necessary motivation, on the appropriate use of these strata and components and will form a basis for further research on this system. The principles of veld management and the influence of management practices on sustainable animal production from natural pastures. This will enable the student to advise users on veld management and veld management principles. It will also form a basis for further research on veld management.

WDE320	**PLANTED_PAST_&_FODDERCROPS_320**				
NAS_PGW	n a	Bilingual	2 + 0.5	S2	14

The establishment and use of planted pastures species and fodder crops and the conservation of fodder. This will enable students to advise users on establishment and utilization of planted pastures species as well as farmers on the production, conservation and optimum use of fodder. This will also form a basis for further research on planted pastures.
Prerequisite: [WDE310]

WDE450	**EVALUAT.OF_RANGE_&_FORAGES_450**				
NAS_PGW	WDE421	Bilingual	3 + 0.5	S1	14

Determining veld condition and grazing capacity on the basis of botanical composition, grazing gradients, species preference and utilization value. Evaluation of grasses / forage crops in terms of environmental adaptation, acceptability and adaptability to a utilization system and the management requirements of an integrated production system.

WDE461	**TURFGRASS_MANAGEMENT_461**				
NAS_PGW	WDE412	Bilingual	2 + 0.5	S2	14

The choice and characteristics of suitable turfgrass species, preparation of substrates, establishment techniques and maintenance practices for sports fields as well as the reclamation of disturbed soils.

WKD151	**ATMOSPHERIC_PROCESSES_151**				
NAS_GGY	WKD151	English	4 + 1	K1	8

Weather and climate. Origin and composition of the atmosphere. Oxygen, carbon and life. Meteorological instruments. Temperature distribution and heat capacity. Atmospheric mass and pressure. Radiation. Zenith angle of the sun. Sunshine variability. The boundary layer. Heat transfer in the boundary layer. Atmospheric heat budget. Urban and rural climates. Equation of state. Air parcel theory. Phases of water and latent heat. Vapour and saturated vapour pressure. Dew point temperature and relative humidity. Dry adiabatic, wet adiabatic and environmental temperature lapse rates. Cloud development. Sensible heat. Comfort zones. Acquisition of data from the South African Weather Bureau: Composition and submission of a report.

WKD152	**ATMOSPHERIC_CIRC.&_CLIMATE_152**				
NAS_GGY	WKD152	English	4 + 1	K2	8

Hadley and Walker (ENSO) cells. Convergence, divergence, convection and subsidence. Polar stratospheric ozone. Air parcel theory. Angular velocity of the earth. Gravitational, centrifugal forces: Gravity force. Pressure gradient force. Coriolis force. Friction force. Rotation of a cyclone and anti-cyclone. Geostrophic wind. Inter-tropical convergence zone (ITCZ). Monsoon rain. Mid-latitude cyclonic frontal systems. Cut-off low. Coastal lows. Jet streams. Tropical cyclones. Foehn effect. Climate and climate

change. Typical circulation patterns over South Africa: Composition and submission of a report.					
WKD162	**DYNAM.&_NUMER._METEOROLOGY_162**				
NAS_GGY	WKD162	English	4 + 1	K3	8
Electromagnetic spectrum. Planck's constant. Radiation energy. Irradiance and radiance. Albedo. Stefan Boltzman law. Global energy balance. Hydrostatic assumption. Hypsometric equation. Equations for the pressure gradient and Coriolis forces. The Geostrophic wind. Vorticity and divergence. Introduction to finite difference methods. Numerical estimation of the geostrophic wind, vorticity and divergence. Advection of temperature. Development of a two-dimensional numerical temperature advection model: Composition and submission of a report.					
WKD164	**CLIMATE_AND_WEATHER_OF_SA_164**				
NAS_GGY	WKD164	English	4 + 0	K4	8
The Climate of Southern Africa. Synoptic weather systems of Southern Africa. Classification of weather types. Synoptic and METAR messages. Weather data on the Internet. Introduction to satellite images and synoptic charts.					
WKD250	**WEATHER_FORECASTING_250**				
NAS_GGY	WKD251,252	English	5 + 0	S1	24
Understanding of all coded meteorological messages. Basic principles and interpretation of satellite imagery. Interpretation of aerological diagrams, dynamic and thermodynamic variables. Integration of information to describe the current state of the atmosphere and to predict a future state of the atmosphere.					
WKD253	**COMMUNITY_PROJECT_253**				
NAS_GGY	WKD253	English	3 + 0	S1	12
Identification and execution of a community project with the aim to provide meteorological information to the general South African public. A project proposal including a budget will be drawn up before the project commences and a project report will be drawn up after completion of the project.					
WKD261	**PHYSICAL_METEOROLOGY_261**				
NAS_GGY	WKD261	English	4 + 0	K3	12
Conservative forces and conservation laws. Basic thermodynamic laws for dry and humid air. The equation of state. Adiabatic processes and temperature lapse rates. The Clausuis-Claperon equation. Calculation of the wet adiabat.					
WKD351	**ATMOSPHERIC_BALANCE_LAWS_351**				
NAS_GGY	WKD351	English	4 + 1	K1	18
Acceleration in rotating co-ordinates, fundamental forces, momentum equation, one, two and three dimensional flow balance, conservation of mass, heat equation, thermodynamic energy equation.					
WKD352	**ATMOSP._VORTIC._&DIVERGENC.352**				
NAS_GGY	WKD352	English	4 + 1	K2	18
Scale analyses and simplification of the basic equations. The geostrophic, thermal and gradient wind. The vorticity equation and divergence.					

WKD360	**RESEARCH_PROJECT_360**				
NAS_GGY	WKD363,364	Bilingual	0 + 2	S2	36
Literature survey, acquisition and manipulation of data, research report, presentation of research results.					
WKD361	**QUASI-GEOSTROPHIC_ANALYSIS_361**				
NAS_GGY	WKD361	English	4 + 0	K3	18
Tendency and Omega equations. Model of a boroclinic system. Introduction to numerical models.					
WKD362	**CLOUD_&_BOUNDARY_LAYER_DYN.362**				
NAS_GGY	WKD362	English	4 + 0	K4	18
Introduction to cloud dynamics. Classification and development of clouds. Cumulonimbus clouds, super cell storms and tornadoes. Planetary boundary layer, atmospheric turbulence, Reynolds average, turbulent kinetic energy, the Ekman layer, secondary circulation.					
WKE420	**WILDLIFE_SCIENCE_420**				
NAS_VKU	n a	Afrikaans	2 + 0	S2	10
Introductory aspects of wildlife conservation, habitat management, wildlife nutrition and keeping wildlife in zoological gardens. **Prerequisites:** [VGE301] and [VKU361] or [TDH]					
WLK410	**WOOL_SCIENCE_410**				
NAS_VKU	n a	Afrikaans	1 + 0.5	S1	8
Development of follicles and growth of wool. The morphology, physical and chemical characteristics of wool fibre. The classing, marketing and processing of wool. Physical testing. Regulations with regard to the classing and packaging of wool. Class standards of the NWGA.					
WST111	**MATHEMATICAL_STATISTICS_111**				
EB_WST	WST110	Bilingual	4 + 1	S1	16
Introductory statistical concepts: sampling, classification of data, graphic representation, descriptive measures and exploratory data analysis. Probability theory. Introductory theory. Introductory distribution theory and special statistical distributions. Generating functions and moments. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. **Prerequisite:** [Par 1.2]					
WST121	**MATHEMATICAL_STATISTICS_121**				
EB_WST	WST120	Bilingual	4 + 1	S2	16
Statistical inference: Point and interval estimation. Hypothesis testing with applications in one and two-sample cases. Analysis of variance. Distribution-free testing methods. Curve fitting. Correlation and regression. Introductory categorical data analysis. Indices. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. Report writing. **Prerequisite:** [WST111 GS]					

WST211	MATHEMATICAL_STATISTICS_211				
EB_WST	WST210	Bilingual	4 + 2	S1	24

Set theory. Probability measure functions. Random variables. Distribution functions. Probability mass functions. Density functions. Expected values. Moments. Moment generating functions. Special probability distributions: Bernoulli, binomial, hypergeometric, geometric, negative binomial, Poisson, Poisson process, discrete uniform, uniform, gamma,exponential, Weibull, Pareto, normal. Joint distibutions: Multinomial, extended hypergeometric, joint continuous distributions. Marginal distributions. Independent random variables. Conditional distributions. Covariance, correlation. Conditional expected values. Transformation of random variables: Convolution formula. Order statistics. Stochastic convergence: Convergence in distribution. Central limit theorem. Practical applications. Practical statistical modelling and analysis using statistical computer packages and the interpretation of the output.
Prerequisites: [WST111] and [WST121] and [WTW114 GS] and [WTW126 GS] and [WTW128 GS]

WST221	MATHEMATICAL_STATISTICS_221				
EB_WST	WST220	Bilingual	4 + 2	S2	24

Stochastic convergence: asymptotic normal distributions, convergence in probability. Statistics and sampling distributions: Chi-squared distribution. Distribution of the sample mean and sample variance for random samples from a normal population. t distribution. F distribution. Beta distribution. Point estimation: Method of moments. Maximum likelihood estimation. Unbiased estimators. Uniform minimum variance unbiased estimators. Cramer-Rao inequality. Efficiency. Consistency. Asymptotic relative efficiency. Bayes estimators. Sufficient statistics. Completeness. The exponential class. Confidence intervals. Test of statistical hypotheses. Reliability and survival distributions. Practical applications. Practical statistical modelling and analysis using statistical computer packages and the interpretation of the output.
Prerequisite: [WST211 GS]

WST311	MULTIVARIATE_ANALYSIS_311				
EB_WST	Part of WST310	Bilingual	2 + 1	S1	18

Multivariate statistical distributions: Moments of a distribution, moment generating functions, independence. Multivariate normal distribution: Conditional distributions, partial and multiple correlations. Multinomial and multivariate Poisson distributions: Asymptotic normality and estimation of parameters. Distribution of quadratic forms in normal variables. Multivariate normal samples: Estimation of the mean vector and covariance matrix, estimation of correlation coefficients, distribution of the sample mean, sample covariance matrix and sample correlation coefficients. The linear model: Models of full rank, least squares estimators, test of hypotheses. Practical applications: Practical statistical moodelling and analysis using statistical computer packages and interpretation of the output.
Prerequisites: [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]

WST312	STOCHASTIC_PROCESSES_312				
EB_WST	Part of WST310	Bilingual	2 + 1	S1	18

Definition of a stochastic process. Stationarity. Covariance stationary. Markov property. Random walk. Brownian motion. Markov chains. Chapman-Kolmogorov equations. Recurrent and transient states. First passage time. Occupation times. Markov jump processes. Poisson process. Birth and death processes. Structures of processes. Structure of the time-homogeneous Markov jump process. Applications in insurance.

Practical statistical modelling, analysis and simulation using statistical computer packages and the interpretation of the output. **Prerequisites:** [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]					
WST321	**TIME_SERIES_ANALYSIS_321**				
EB_WST	WST361	Bilingual	2 + 1	S2	18
Stationary and non-stationary univariate time series. Properties of autoregressive moving average (ARMA) and outoregressive integrated moving average (ARIMA) processes. Identification, estimation and diagnostic testing of a time series model. Forecasting. Multivariate time series. Practical statistical modelling and analysis using statistical computer packages. **Prerequisites:** [WST211] and [WST221] and [WST311 GS] and [WTW211 GS] and [WTW218 GS]					
WST322	**ACTUARIAL_STATISTICS_322**				
EB_WST	WST362	Bilingual	2 + 1	S2	18
Decision theory. Loss distributions. Reinsurance. Risk models. Ruin theory. Credibility theory. Methods to forecast future claim numbers and amounts. The generalized linear model: Exponential family, mean and variance, link functions, deviance and residual analysis, test statistics, log-linear and logit models. Practical statistical modelling and analysis using statistical computer packages. **Prerequisites:** [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]					
WST362	**MATHEMATICAL_STATISTICS_362**				
EB_WST	WST320(2)	Bilingual	2 + 1	S1	18
Distribution-free methods: one, two and multi-sample rank tests. Linear rank test statistics with applications. Rank correlation. Asymptotic relative efficiency. Student seminars. Identification, use, evaluation and interpretation of statistical computer packages and statistical techniques. **Prerequisites:** [WST211] and [WST221] and [WTW211 GS] and [WTW218 GS]					
WTW114	**CALCULUS_114**				
NAS_WTW	n a	Double	4 + 1	S1	16
Functions, limits and continuity. Differential calculus of single variable functions, rate of change, graph sketching, applications. The mean value theorem, the rule of L'Hospital. Definite and indefinite integrals, the fundamental theorem of Calculus, the mean value theorem for integrals, integration techniques. This module serves as preparation for students majoring in Mathematics (including all students who intend to enrol for WTW 218 and WTW 220). Students will not be credited for more than one of the following modules for their degree: WTW 114, WTW 158, WTW 134. (4 lectures and 1 tutorial of 3 hours) **Prerequisite:** [Par 1.2]					
WTW115	**DISCRETE_STRUCTURES_115**				
NAS_WTW	n a	Double	2 + 1	S1	8
Propositional logic: truth tables, logical equivalence, implication, arguments. Mathematical induction and well-ordering principle. Introduction to set theory. Counting techniques: elementary probability, multiplication and addition rules, permutations and combinations, binomial theorem, inclusion-exclusion rule. (2 lectures and 1 tutorial of 1½ hours) **Prerequisite:** [Par 1.2]					

WTW123	NUMERICAL_ANALYSIS_123				
NAS_WTW	n a	Double	2 + 1	S2	8

Non-linear equations, numerical integration, initial value problems for differential equations, systems of linear equations. Algorithms for elementary numerical techniques are derived and implemented in computer programs. Error estimates and convergence results are treated. (2 lectures and 1 tutorial of 1½ hours)
Prerequisite: [WTW114 GS]

WTW126	LINEAR_ALGEBRA_126				
NAS_WTW	n a	Double	2 + 1	S2	8

Vector algebra with applications, matrix algebra, systems of linear equations, the vector space R^n, bases, determinants. Mathematical induction. Complex numbers and factorisation of polynomials. This module also includes a technique mastering programme. This module serves as preparation for students majoring in Mathematics (including all students who intend to enrol for WTW 211). (2 lectures and 1 tutorial of 1½ hours)
Prerequisite: [Par 1.2]

WTW128	CALCULUS_128				
NAS_WTW	n a	Double	2 + 1	S2	8

Integration techniques, improper integrals. Applications of integration. Taylor's theorem. Vector functions of one variable. Multivariable functions and their line integrals. Vector fields and their line integrals. Directional derivatives and the fundamental theorem for line integrals. Geometric meaning of the gradient. This module serves as preparation for students majoring in Mathematics (including all students who intend to enrol for WTW 218 and WTW 220). (2 lectures and 1 tutorial of 1½ hours)
Prerequisite: [WTW114 GS]

WTW133	PRECALCULUS_133				
NAS_WTW	n a	English	5 + 1	S1	8

Real numbers, elementary set notation, exponents and radicals. Algebraic expressions, fractional expressions, linear and quadratic equations, inequalities. Coordinate geometry: lines, circles. Functions: definition, notation, piecewise defined functions, absolute value, domain and range, graphs, transformations of functions, symmetry, even and odd functions, combining functions, one-to-one functions and inverses, polynomial functions and zeros. Sequences, summation notation, arithmetic, geometric sequences, infinite geometric series, annuities and instalments. Degrees and radians, unit circle, trigonometric functions, fundamental identities, trigonometric graphs, trigonometric identities, double-angle, half-angle formulae, inverse trigonometric functions, trigonometric equations, applications.
(5 lectures, 1 practical session of 1 hour and 1 tutorial of 2 hours)
Prerequisite: [BSc 4 year programme]

WTW134	MATHEMATICS_134				
NAS_WTW	n a	Double	4 + 1	S1	16

Functions, derivatives, interpretation of the derivative, rules of differentiation, applications of differentiation, integration, interpretation of the definite integral, applications of integration. Discrete probability, matrices, solutions of systems of equations. Markov chains. Students will not be credited for more than one of the following modules for their degree: WTW 134, WTW 114, WTW 158. WTW 134 does

not generally lead to admission to Mathematics at 200 level and is intended for students who require Mathematics at 100 level only. WTW134 can also be taken in the second semester. (4 lectures and 1 tutorial of 1½ hours)
Prerequisite: [Par 1.2]

WTW143	**CALCULUS_143**				
NAS_WTW	n a	English	4 + 1	S2	8

Functions: exponential and logarithmic functions, natural exponential and logarithmic functions, exponential and logarithmic laws, exponential and logarithmic equations, compound interest. Limits: concept of a limit, finding limits numerically and graphically, finding limits algebraically, limit laws without proofs, squeeze theorem without proof, one-sided limits, infinite limits, limits at infinity, vertical, horizontal and slant asymptotes, substitution rule, continuity, laws for continuity without proofs. Differentiation: average and instantaneous change, definition of derivative, differentiation rules without proofs, derivatives of polynomials, chain rule for differentiation, derivatives of trigonometric, exponential and logarithmic functions, applications of differentiation: extreme values, critical numbers, monotone functions, first derivative test, optimisation. (4 lectures, 1 practical session of 1 hour and 1 tutorial of 2 hours)
Prerequisite: [WTW133]

WTW152	**MATHEMATICAL_MODELLING_152**				
NAS_WTW	n a	Double	2 + 1	S1	8

Introduction to the modelling of dynamical processes using difference equations. Curve fitting. Introduction to linear programming. Matlab programming. Applications to real-life situations in, among others, finance, economics and ecology. (2 lectures and 1 tutorial of 1½ hours).
Prerequisite: [Par 1.2]

WTW153	**CALCULUS_153**				
NAS_WTW	n a	English	4 + 1	S1	8

Rigorous treatment of limits and continuity. Differential calculus of a single variable with proofs and applications. The mean value theorem, the rule of L'Hospital. Upper and lower sums, definite and indefinite integrals, the fundamental theorem of Calculus, the mean value theorem for integrals, integration techniques, with some proofs.
(4 lectures, 1 practical session of 1 hour and 1 tutorial of 2 hours)
Prerequisite: [WTW143]

WTW158	**CALCULUS_158**				
NAS_WTW	n a	Double	4 + 1	S1	16

Vector algebra with applications to geometry. Functions, limits and continuity. Differential calculus of single variable functions, rate of change, graph sketching, applications. The mean value theorem, the rule of L'Hospital. Indefinite integrals, integration techniques. This module is designed for first year engineering students. Students will not be credited for more than one of the following modules for their degree: WTW 158, WTW 114, WTW 134. (4 lectures and 1 tutorial of 3 hours)
Prerequisite: [Par 1.2]

WTW162	**DYNAMICAL_PROCESSES_162**				
NAS_WTW	n a	English	2 + 1	S2	8

Introduction to the modelling of dynamical processes using elementary differential equations. Solution methods for first order differential equations and analysis of

properties of solutions (graphs). Applications to real life situations. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW114 GS] and [WTW152 GS]					
WTW211	**LINEAR_ALGEBRA_211**				
NAS_WTW	n a	Double	2 + 1	S1	12
Matrices and linear equations, linear independence, real vector spaces and subspaces, eigenvalues, eigenvectors, diagonalisation of matrices, applications of eigenvalue problems, linear transformations. (2 lectures and 1 tutorial of 1½ hours) **Prerequisite:** [WTW126]					
WTW218	**CALCULUS_218**				
NAS_WTW	n a	Double	2 + 1	S1	12
Calculus of multivariable functions, directional derivatives. Extrema and Lagrange multipliers. Multiple integrals, polar, cylindrical and spherical coordinates. Line integrals and the theorem of Green. Surface integrals and the theorems of Gauss and Stokes. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW114] and [WTW128]					
WTW220	**ANALYSIS_220**				
NAS_WTW	n a	Double	2 + 1	S2	12
Properties of real numbers. Analysis of sequences and series of real numbers. Power series and theorems of convergence. The Bolzano-Weierstrass theorem and the intermediate value theorem. Analysis of real-valued functions on an interval. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW114] and [WTW128]					
WTW221	**LINEAR_ALGEBRA_221**				
NAS_WTW	n a	Double	2 + 1	S2	12
Change of basis, diagonalisability of linear transformations, orthogonal vectors, unitary and orthogonal transformations, canonical forms, applications. (2 lectures and 1 tutorial of 1½ hours) **Prerequisite:** [WTW211]					
WTW285	**DISCRETE_STRUCTURES_285**				
NAS_WTW	n a	Double	2 + 1	S2	12
Setting up and solving recurrence relations. Equivalence and partial order relations. Graphs: paths, cycles, trees, isomorphism. Graph algorithms: Kruskal, Prim, Fleury. Finite state automata. (2 lectures and 1 tutorial of 1½ hours) **Prerequisite:** [WTW115]					
WTW286	**DIFFERENTIAL_EQUATIONS_286**				
NAS_WTW	n a	Double	2 + 1	S2	12
Separable differential equations. Theory and solution methods for linear differential equations as well as for systems of linear differential equations. Introduction to qualitative analysis of linear and non-linear systems. Applications with emphasis on Physics. Numerical approximations in applications. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW114] and [WTW126] and [WTW128]					

WTW310	**ANALYSIS_310**				
NAS_WTW	n a	Bilingual	2 + 1	S1	18
Topology of finite dimensional spaces: Open and closed sets, compactness, connectedness and completeness. Theorems of Bolzano-Weierstrass and Heine-Borel. Properties of continuous functions and applications. Integration theory in R^1 and R^p. Sequences of functions. (2 lectures and 1 tutorial of 1½ hours) **Prerequisite:** [WTW220]					
WTW320	**ANALYSIS_320**				
NAS_WTW	n a	Bilingual	2 + 1	S2	18
Series of functions, power series and Taylor series. Complex functions, Cauchy-Riemann equations, Cauchy's theorem and integral formulas. KMS states. Laurent series, residue theorem and calculation of real integrals using residues. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW218] and [WTW310]					
WTW354	**FINANCIAL_ENGINEERING_354**				
NAS_WTW	n a	Bilingual	2 + 1	S1	18
Mean variance portfolio theory. Market equilibrium models such as the capital asset pricing model. Factor models and arbitrage pricing theory. Measures of investment risk. Efficient market hypothesis. Stochastic models of security prices. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WST211] and [WTW211] and [WTW218]					
WTW364	**FINANCIAL_ENGINEERING_364**				
NAS_WTW	n a	English	2 + 1	S2	18
Discrete time financial models: Arbitrage and hedging; the binomial model. Continuous time financial models: The Black-Scholes formula; pricing of options and the other derivatives; interest rate models; numerical procedures. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WST211] and [WTW126] and [WTW218] and [WTW286]					
WTW381	**ALGEBRA_381**				
NAS_WTW	n a	Bilingual	2 + 1	S1	18
Group theory: Definition, examples, elementary properties, subgroups, permutation groups, isomorphism, order, cyclic groups, homomorphisms, factor groups. Ring theory: Definition, examples, elementary properties, ideals, homomorphisms, factor rings, polynomial rings, factorisation of polynomials. Field extensions, applications to straight-edge and compass constructions. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW114] and [WTW211]					
WTW382	**DYNAMICAL_SYSTEMS_382**				
NAS_WTW	n a	Bilingual	2 + 1	S1	18
Matrix exponential function: Homogeneous and non-homogeneous linear systems of differential equations. Qualitative analysis of systems: phase portraits, stability, linearisation, energy method and Liapunov's method. Introduction to chaotic systems. Application to real life problems. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW220] and [WTW286]					

WTW383	NUMERICAL_ANALYSIS_383				
NAS_WTW	n a	Bilingual	2 + 1	S2	18
Direct methods for the numerical solution of systems of linear equations, pivoting strategies. Iterative methods for solving systems of linear equations and eigenvalue problems. Iterative methods for solving systems of nonlinear equations. Introduction to optimization. Algorithms for the considered numerical methods are derived and implemented in computer programs. Complexity of computation is investigated. Error estimates and convergence results are proved. (2 lectures and 1 practical of 1½ hours) **Prerequisites:** [WTW114] and [WTW128] and [WTW211]					
WTW385	**DISCRETE_STRUCTURES_385**				
NAS_WTW	n a	Bilingual	2 + 1	S2	18
Basic combinatorial objects: Selections, arrangements, permutations, partitions. Algorithmic generation of combinatorial objects. Generating functions, group actions, Polya theory. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW126] and [WTW218] and [WTW285]					
WTW386	**PARTIAL_DIFF_EQUATIONS_386**				
NAS_WTW	n a	Bilingual	2 + 1	S1	18
Conservation laws and modelling. Fourier analysis. Heat equation, wave equation and Laplace's equation. Solution methods including Fourier series. Energy and other qualitative methods. (2 lectures and 1 tutorial of 1½ hours) **Prerequisites:** [WTW218] and [WTW286]					
WTW387	**CONTINUUM_MECHANICS_387**				
NAS_WTW	n a	English	2 + 1	S2	18
Kinematics of a continuum: Configurations, spatial and material description of motion. Conservation laws. Analysis of stress, strain and rate of deformation. Linear constitutive equations. Applications: Vibration of beams, equilibrium problems in elasticity and special cases of fluid motion. (2 lectures and 1 tutorial of 1 ½ hours) **Prerequisites:** [WTW218] and [WTW286]					
WTW389	**GEOMETRY_389**				
NAS_WTW	n a	Bilingual	2 + 1	S2	18
Elementary Euclidean geometry. Axiomatic development. The parallel postulate and non-Euclidean geometry. Orthogonal circles and inversion in circles. Models of different geometries. (2 lectures and 1 tutorial of 1½ hours) **Prerequisite:** [WTW211]					
ZEN161	**ANIMAL_DIVERSITY_161**				
NAS_ZEN	n a	Double	2 + 0.5	S2	8
Animal classification, phylogeny, organization and terminology. Evolution of the various animal phyla, morphological characteristics and life cycles of parasitic and non-parasitic animals. Structure and function of reproductive, respiratory, excretory, circulatory and digestive systems. **Prerequisite:** [MLB111 GS] or [TDH]					
ZEN251	**INVERTEBRATE_BIOLOGY_251**				
NAS_ZEN	n a	English	4 + 1	K1	12
Origin and extent of modern invertebrate diversity; parasites of man and domestic					

animals; biology and medical importance of arachnids; insect life styles; the influence of the environment on insect life histories; insect phytophagy, predation and parasitism; insect chemical, visual, and auditory communication; freshwater invertebrates and their use as biological indicators. **Prerequisite:** [ZEN161 GS] or [TDH]					
ZEN261	**AFRICAN_VERTEBRATES_261**				
NAS_ZEN	n a	English	4 + 1	K3	12
Introduction to general vertebrate diversity; African vertebrate diversity; vertebrate structure and function; vertebrate evolution; vertebrate relationships; aquatic vertebrates; terrestrial ectotherms; terrestrial endotherms; vertebrate characteristics; classification; structural adaptations; habits; habitats; conservation problems; impact of humans on other vertebrates. **Prerequisite:** [ZEN161 GS] or [TDH]					
ZEN351	**POPULATION_ECOLOGY_351**				
NAS_ZEN	n a	English	4 + 2	K1	18
Scientific approach to ecology; evolution and ecology; the individual and its environment; population characteristics and demography; competition; predation; plant-herbivore interactions; regulation of populations; population manipulation.					
ZEN352	**MAMMALOGY_352**				
NAS_ZEN	n a	English	4 + 2	K1	18
Mammalian origins and their characteristics: evolution of African mammals; structure and function: integument, support and movement; foods and feeding; environmental adaptations; reproduction; behaviour; ecology and biogeography; social behaviour; sexual selection; parental care and mating systems; community ecology; zoogeography. Special topics: parasites and diseases; domestication and domesticated mammals; conservation.					
ZEN353	**COMMUNITY_ECOLOGY_353**				
NAS_ZEN	n a	English	4 + 2	K2	18
The scientific approach; characteristics of the community; the community as a superorganism; community changes; competition as a factor determining community structure; disturbance as a determinant of community structure; community stability; macroecological patterns and mechanisms.					
ZEN354	**PHYSIOLOGY_354**				
NAS_ZEN	n a	English	4 + 2	K2	18
The module in animal physiology is designed to promote understanding of animals as integrated systems at every level of organization. The module focuses on the function of tissues, organs and organ systems of multicellular organisms in chemical and physical terms. Animal physiology is the study of how a living animal functions. This module adopts a systems-based approach that covers many of the sub-disciplines of physiology, ranging from neural physiology and endocrinology to mechanoreception and osmoregulation.					
ZEN355	**INSECT_DIVERSITY_355**				
NAS_ZEN	n a	English	4 + 2	K1	18
The extent and significance of insect diversity. Functional insect morphology. The basic principles of taxonomy and the classification of taxa within the Insecta. Insect orders					

and economically and ecologically important southern African insect families. Identification of insect orders and families using distinguishing characteristics. General biological and behavioural characteristics of each group. Grouping of insects into similar life-styles and habitats. **Prerequisite:** [ZEN251 GS] or [TDH]					
ZEN361	**ECOPHYSIOLOGY_361**				
NAS_ZEN	n a	English	4 + 2	K3	18
The costs of living; factors affecting metabolic rate; limitations to the acquisition of energy and nutrients; the principles of nutritional ecology; problems associated with herbivorous diets; the effects of temperature on whole organism processes and the response of species to temperature variation; ectothermic and endothermic temperature regulation; animal responses to high and low temperatures; water balance physiology of insects and vertebrates; osmoregulation in aquatic and terrestrial environments; the importance of physiological ecology for understanding geographic variation in body size, range size, and abundance.					
ZEN362	**EVOLUTION_AND_PHYLOGENY_362**				
NAS_ZEN	n a	English	4 + 2	K3	18
Evolution as a process and pattern, prime movers in evolution: selection, drift, general population genetics. Population differentiation, clines, subspecies and species, adaptation as a major force in evolution and the panglossian paradigm, molecular evolution. Phylogeography, phylogenetic reconstruction. Evolutionary biogeography. Adaptation, Darwin's formulation, proximate and ultimate causation, genetic and developmental constraints, optimality. Phenotypic models, the comparative method, convergent evolution. Evolution of complex biological systems, origin of life and sex, macro-evolution, punctuated equilibrium, human evolution. Levels of selection. Species concepts.					
ZEN363	**BEHAVIOURAL_ECOLOGY_363**				
NAS_ZEN	n a	English	4 + 2	K4	18
The history of behavioural ecology. A causal, developmental, evolutionary and adaptive approach. Sensory systems and communication. Sexual selection, mate choice and sperm competition. Kin selection and group living. Special reference to social insects. The behavioural ecology of humans. Phylogenetic basis of behavioural analysis. The role of behavioural ecology in conservation planning.					
ZEN364	**CONSERVATION_ECOLOGY_364**				
NAS_ZEN	n a	English	4 + 2	K4	18
This module is intended to provide students with skills to undertake field surveys that are essential for research and planning in the conservation of biodiversity. The module has a large fieldwork component. A field trip will be conducted over a ten-day period during the September vacation in the Sani Pass region of the Drakensberg (including South Africa and Lesotho). The students will be actively involved in planning and executing the field surveys, and will be responsible for analysing and presenting the results. The students will gain valuable practical experience in the field by applying a number of survey techniques and focusing on several different taxa that are relevant to conservation ecology.					

ZEN365	INSECT_PEST_MANAGEMENT_365				
NAS_ZEN	n a	English	4 + 2	K4	18

Definition, classification and characteristics of insect pests. Concepts of economic levels. Monitoring, surveys, sampling and forecasting. Yield loss assessment. Philosophy and context of integrated pest management. Alternative methods of pest control. Insecticide resistance and management. Important pests of South African agricultural crops, gardens and lawns.
It is strongly recommended that students first complete ZEN 355: Insect Diversity 355.

POSTGRADUATE STUDIES

Sc.10 HONOURS DEGREES

SC.10.1 BACCALAUREUS SCIENTIAE HONORES [BSc(Hons)]

Also consult General Regulations G.1.3; G.16 – G. 29 and G.62, and postgraduate syllabi.

(a) Admission requirements and prerequisites

(i) **For the BSc(Hons) degree**
Subject to the stipulations of General Reg. G.16, a student is only admitted to the study for the honours degree if he or she holds the BSc or BSecEd(Sci) degree with an average mark of at least 60% and provided that he or she complies with the stipulations for the particular modules as set out in the syllabi descriptions.

(ii) The curriculum is compiled in consultation with the head of department, from whom full details may be obtained except if mentioned otherwise.

(iii) In cases where the required module or linguistic basis is lacking, additional modules may be prescribed.

(b) Examination admission and pass requirements

For preparation, evaluation and examination of essays, consult the manual of the Faculty, which is obtainable on request from the head of department. The pass mark for essays is at least 50%. The stipulations regarding pass requirements for dissertations in General Regulation G.60.2.1 2(a) apply *mutatis mutandis* to essays.

(c) Degree with distinction

The BSc(Hons) degree is awarded with distinction to a candidate who obtains a weighted average of at least 75% in all the prescribed modules and a minimum of 65% in any one module.

(d) Degrees

Discipline	Degree code
Actuarial Science	02240275
Animal Science	03241201
Applied Mathematics	02240171
Biochemistry	03241011
Bioinformatics	03241014

Biotechnology	02240392
Chemistry	02240121
Engineering and Environmental Geology	02240372
Entomology	03241031
Financial Engineering	02240274
Food Science	03240921
Genetics	03241051
Geography	02240411
Environmental Analysis and Management	02240412
Geoinformatics	02240408
Geology	02240141
Mathematical Statistics	02240191
Mathematics of Finance	02240272
Mathematics	02240181
Medicinal Plant Science	03241090
Meteorology	02240070
Microbiology	03240911
Nutrition and Food Science	03240922
Physics	02240231
Plant Pathology	03240931
Plant Science	03241091
Soil Science	03240901
Wildlife Management	03241001
Zoology	03241021

Sc.10.2 BACCALAUREUS INSTITUTIONIS AGRARIAE HONORES [BInstAgrar(Hons)]

Also consult General Regulations G.16 to G.29

(a) Admission requirements

Subject to the stipulations of General Regulations G.1.3 and G.62, a candidate must hold the BInstAgrar degree or an appropriate bachelor's degree to be admitted to the BInstAgrar(Hons). Additional modules in the field of specialisation other than the honours modules may be prescribed by the Dean, on the recommendation of the head(s) of the department(s) concerned.

(b) Duration

Training is offered full-time, and in certain fields of specialisation also on part-time basis. The programme extends over at least two semesters for full-time students, while the part-time programme extends over at least four semesters.

(c) Curriculum

The curriculum consists of a minimum of eight modules, which include the following:

- A common core of modules, ARD 780 and 783, is compulsory for all fields of specialisation, except in the case of the Extension option, for which only ARD 781 and 782 are compulsory. Credit for equivalent modules already passed may be considered, in which case suitable alternative modules will be prescribed by the Dean in consultation with the relevant head of the department concerned.

- The prescribed module work in the student's field of specialisation. Credit for equivalent modules already passed may be considered, in which case suitable alternative modules will be prescribed by the Dean in consultation with the head of the department concerned.
- Additional modules required for the particular field of specialisation, as stipulated by the Dean in consultation with the head of the department concerned.

(d) Degree with distinction

A student must obtain a weighted average of at least 75 % in all the prescribed modules, with a minimum of 65 % in each of the modules to pass the degree with distinction.

(e) Degrees

Discipline	Degree code
Agricultural Economics	03242021
Crop Protection	03242062
Extension	03242011
Plant Production	03242031
Plant Protection	03242061
Plant Quarantine	03242183
Rural Development Planning	03242023

Sc.11 MASTER'S DEGREES

Sc.11.1 MAGISTER SCIENTIAE (MSc)

Also consult General Regulations G.30 – G.44.

(a) Admission requirements for MSc degree

Subject to the stipulations of General Regulations G.30, G.1.3 and G.62, an applicable honours degree is a prerequisite for admission. Additional requirements may be set by the Dean on the recommendation of the head of department. A candidate with an average mark of less than 60% for the honours degree will only be admitted to the MSc degree study with the approval of the Dean on the recommendation of the head of department.

(b) Conferment of degree

The MSc degree is conferred by virtue of a dissertation and such additional postgraduate modules as may be prescribed.

(c) Pass requirements

(i) A pass mark of at least 50% must be obtained in both the dissertations and the additional prescribed modules, if such additional module work is prescribed.

(ii) Preparation, evaluation and examination of dissertation is available from the Head of Department on request. The passmark for dissertations is 50%. The stipulations with regard to pass requirements for dissertations in G.60.2.1.2 (a) apply *mutatis mutandis* to essays.

(d) Degree with distinction

The degree is conferred with distinction on a student who obtains a final average of at least 75%, as well as at least 75% for the dissertation and provided that all the members of the Examination Commission indicate in writing that the degree be conferred with distinction.

(e) General

Students should take particular note of the maximum period of registration (General Regulation G.32.4), as well as of the requirement regarding submission of a draft article/articles for publication (General Regulation G. 61).

(f) Degrees

Discipline	Degree code
Actuarial Science	02250395
Air Quality Management	03251038
Applied Mathematics	02250171
Applied Mineralogy	02250381
Biochemistry	03251011
Bioinformatics	03251014
Biotechnology	03251052
Chemistry	02250121
Engineering and Environmental Geology	02250372
Entomology	03251031
Environment and Society (Coursework)	03251032
Environmental Ecology (Coursework)	03251033
Environmental Economy (Coursework)	03251034
Environmental Education	02250443
Environmental Management	03251037
Financial Engineering	02250184
Food Science	03250921
Genetics	03251051
Geography	02250411
Geoinformatics	02250412
Geology	02250141
Mathematical Statistics	02250191
Mathematics Education	02250183
Mathematics of Finance	02250182
Mathematics	02250181
Medicinal Plant Science	03251090
Meteorology	02250070
Microbiology	03250911
Physics	02250231
Plant Pathology	03250881
Plant Science	03251091
Postharvest Technology	03251102
Science Education	02250442
Soil Science	03250901
Water Resource Management (Coursework)	03251035
Wildlife Management	03251001
Zoology	03251021

Sc.11.2 MAGISTER PHILOSOPHIAE [MPhil] (Code: 03250700)

Also consult General Regulation G. 62

(a) Admission requirements
Students wishing to enroll for the MPhil(Wildlife Management) should have a approved four-year first degree at a recognised university or any qualification that is accepted by the Senate as equivalent to it in terms of Regulation G. 62.

(b) Duration
The duration of the internet-based part-time programme is two years. The theoretical component forms 40%, the research project and thesis 35% and the practical component 25% of the programme.

(c) Curriculum
This programme aims to educate candidates interested in this field but who come from non-biological backgrounds. It is a postgraduate programme focusing on the philosophy, ethics, ecological principles and application of wildlife management.

Sc.11.3 MAGISTER SCIENTIAE AGRICULTURAE [MSc(Agric)]

Also consult General Regulations G.30 to G.44.

(a) Requirements for admission
Subject to the stipulations of General Regulations G.1.3 and G.62, the four-year BSc(Agric) degree with an average of 60% in the final year of the major subject is a requirement for admission to the MSc(Agric) degree. Additional requirements may be stipulated by the head of department.

(b) Duration
Duration of study is at least two years of uninterrupted full-time study (or the part-time equivalent) at this University.

(c) Residence
The Dean may on the recommendation of the head of the department concerned, set particular requirements concerning residence during master's degree studies.

(d) Curricula
The curriculum for the MSc(Agric) degree consists of:
(i) a dissertation; and
further study in the major subject, supplemented by ancillary module/s as may be required by the Dean, on the recommendation of the Head of Department. Students who hold the BSc(Agric)(Hons) degree may be exempted from further ancillary modules.
(ii) A total of 240 credits is required for the MSc(Agric) degree, of which 120 are for the dissertation.

(e) Examinations and pass requirements
(i) The final examinations for the MSc(Agric) may only be taken at the end of the second year of study.

(ii) The examinations in the ancillary modules, if required, must be passed before or concurrent with the examinations in the major subject, unless the Board of the Faculty decides differently.
(iii) General Regulation G.12.2, as well as paragraph 4 of the Faculty regulations pertaining to examination admission and pass requirements, are applicable to the calculation of marks.
(iv) A student must pass all prescribed modules as well as the dissertation to obtain the MSc(Agric) degree.
(v) The degree is conferred with distinction on a student who obtains a final mark of at least 75%, as well as at least 75% for the dissertation and provided that all the members of the Examination Commission indicate in writing that the degree be conferred with distinction.

(f) General

Students should take particular note of the maximum period of registration (General Regulation G.32.4), as well as of the requirement regarding submission of a draft article/articles for publication (General Regulation G.61).

(g) Degrees

Discipline	Degree code
Agricultural Economics	03250041
Agricultural Extension	03251030
Agronomy	03250454
Animal Science: Production Management	03250441
Animal Science: Animal Breeding and Genetics	03250457
Animal Science: Meat Science	03250122
Animal Science: Production Physiology	03250391
Food Science and Technology	03250261
Horticulture	03250091
Pasture Science	03250455
Soil Science	03250456

Sc.11.4 MAGISTER INSTITUTIONIS AGRARIAE [MInstAgrar]

Also consult General Regulations G. 30 to G. 44.

(a) Admission requirements

Subject to the stipulations of General Requirements G.1.3 and G. 62, a candidate must hold the BInstAgrar, an appropriate four-year degree or an appropriate honours degree for admission to the MInstAgrar degree study. Additional modules may be prescribed by the Dean on the recommendation of the head of department. A candidate with an average mark of less than 60 % for the honours degree will only be admitted to MInstAgrar study with the approval of the Dean, on the recommendation of the head of the department.

(b) Curriculum

The curriculum consists of further study in the field of specialisation and a mini-dissertation, which encompasses research conducted by the student under supervision of a member of the academic staff.

(c) Degree with distinction

The degree is conferred with distinction on a student who obtains a final mark of at least 75%, as well as at least 75% for the mini-dissertation and provided that all the members of the Examination Commission indicate in writing that the degree be conferred with distinction.

(d) General

Students must take particular note of the maximum period of registration (General Regulation G.32.4), as well as of the requirement regarding submission of a draft article/articles for publication (General Regulation G. 61).

(e) Degrees

Discipline	Degree code
Agricultural Economics	03252021
Agronomy	03252072
Animal Production Management	03252093
Crop Protection	03252062
Environmental Management (Coursework)	03252132
Extension	03252011
Horticulture	03252082
Rural Development Planning	03252023
Pasture Science	03252092
Plant Protection	03252061
Plant Quarantine	03252141

Sc.11.5 MASTER'S IN CONSUMER SCIENCE [MConsSc]

(a) Admission requirements

A four-year BConsumer Science or other applicable degree.

(b) Duration

A minimum of two years full-time and a maximum of four years part-time study.

(c) Programme options

There are four disciplines with a further option to choose from, each with a minimum of 240 credits:

(i) **Dissertation option**

Interior Merchandise Management	02253004
Clothing Management	02253006
General	02253009
Food Management	02253008

(ii) **Coursework option with essay**

Interior Merchandise Management	02253003
Clothing Management	02253005
General	02253010
Food Management	02253007

(d) Curriculum (a minimum of 240 credits)

(i) **Dissertation option**
Research Methodology 814 (30 credits)
Theoretical Orientation (30 credits)*
Electives (a minimum of 60 credits)
VBR890 (Dissertation) (120 credits)

(ii) **Coursework option**
Research Methodology 814 (30 credits)
Theoretical Orientation (30 credits)*
Electives (4x30=120 credits)
VBR892 (Essay) (60 credits)

*To earn credits for the Theoretical Orientation, at least one of the following options must be taken:

HSK 810: Theor. Frameworks Cult.Stud. (15 credits)
HSK 812: Theor. Frameworks Cons.Stud. (15 credits)
HSK 813: Socio-Cultural Studies (15 credits)
Other applicable orientations offered in and outside the Department can be taken additionally. (15-30 credits).

Students choose electives on 800-level from the following four electives groupings:
- Clothing and Textiles
- Foods, Nutrition and Food Service Management
- Interior Merchandising and Consumer Facilitation
- Resource Management, Development and Education

Depending on the field of study, a maximum of two postgraduate modules may be selected from disciplines from other departments.
Students who already have an honours degree related to one of the chosen areas of study, may apply for exemption of certain modules.
Depending on the academic background of the student and the chosen area of study, it may be required of the student to take additional modules.
Work on the dissertation/essay consists of three parts, namely the research proposal, project execution and an oral presentation of the research results.

A basic module in Statistics is compulsory when a quantitative approach is used for the research project.

(e) Prerequisites for the dissertation/essay
The Department can be consulted for more information on the structuring of programmes, the content of the theoretical orientations, and electives including their prerequisites.

(f) Degrees

Discipline	**Degree code**
Interior Merchandise Management	02253004
Interior Merchandise Management (Coursework)	02253003
Clothing Management	02253006
Clothing Management (Coursework)	02253005

General	02253009
General (Coursework)	02253010
Food Management	02253008
Food Management (Coursework)	02253007

DOCTORATES

Sc.12 PHILOSOPHIAE DOCTOR [PhD]

Also consult General Regulations G.45 to G.55.

(a) Admission requirements

(i) **PhD degree**

Subject to the stipulations of General Regulations G.1.3, G.45 and G.62, no student will be admitted to the study for a doctor's degree unless he or she holds a masters degree or has been admitted to the status thereof. Further requirements for admission, if any, are set out in the syllabi of the various departments.

(ii) **PhD in Consumer Science**

MConsumer Science or applicable master's degree with a pass mark of at least 60%.

To proceed with the thesis, a student should have fulfilled the requirements for the master's degree regarding:

- Theoretical Orientation
- Research Methodology (NME 814)
- The student should also have published at least one article in a research journal during the two years prior to registration for the PhD degree or have proof that the article has been accepted for publication in a refereed journal.Furthermore, it should also be evident from the master's dissertation or publications that research can be undertaken independently.

  NB The student may be required to do additional module/work.

(b) Duration

A minimum of two years full-time study.

(c) Residence

Doctoral students may be required to reside at the University for further study on the recommendation of the head of department and with the approval of the Dean.

(d) Curriculum

The curriculum for the PhD degree consists of:

(i) theoretical knowledge of the major subject and such ancillary modules as may be required; and

(ii) a thesis.

(e) Conferring of degree

(i) A PhD student must submit a thesis which deals with a topic from the list of subject disciplines.

(ii) The doctoral examination, either written and/or oral, is compulsory and covers the content of the thesis as well as the subdivisions of the field of study on which the thesis is based.

(f) General

Students must take particular note of the maximum period of registration (General Regulation G. 47), as well as of the requirements regarding the submission of a draft article/articles for publication (General Regulation G. 61).

(g) Degrees

Discipline	Degree code
Agrarian Extension	03262002
Agricultural Economics	03260042
Agronomy	03262164
Air Quality Management	03260129
Animal Production Management	02260545
Animal Science	03260141
Biochemistry	03260012
Biotechnology	03262162
Chemistry	02260451
Consumer Science: Development	02263003
Consumer Science: Food Management	02263004
Consumer Science: Interior Merchandise Management	02263001
Consumer Science: Clothing Management	02263002
Crop Protection	03262021
Engineering and Environmental Geology	02260542
Entomology	03260121
Environmental Management	03260125
Environmental Studies	03260127
Food Science	03260272
Genetics	03260292
Geography	02260511
Geoinformatics	02260512
Geology	02260521
Horticulture	03262167
Mathematical Sciences	02260761
Medicinal Plant Science	03261090
Meteorology	02260630
Microbiology	03260072
Nutrition	03261006
Pasture Science	03262165
Physics	02260481
Plant Pathology	03260302
Plant Science	03261091
Rural Development Planning	03262023
Science and Mathematics Education	02260753
Soil Science	03262166
Wildlife Management	03261001
Zoology	03261021

Sc.13 DOCTOR SCIENTIAE DSc

Consult General Regulation G.56.

This degree usually follows on the PhD degree and is conferred by virtue of publications emanating from independent research. The publication must represent a meaningful contribution to a specific subdiscipline.

(a) Guidelines for evaluation

(i) **Disciplines**
The DSc degree in the Faculty of Natural and Agricultural Sciences is conferred by virtue of published research work in one of the disciplines in the faculty.

(ii) **Criteria**
The work submitted for the DSc must constitute an original and important contribution to scientific knowledge and insight in that it is

- regarded as a substantial and coherent contribution to the advancement of the frontiers of knowledge and insight into the specific subdiscipline, and
- proof of the candidate's achievement with regard to international leadership in the specific field of scientific research.

The emphasis in the assessment of the work of a DSc candidate must be placed on originality, substance and excellence.

(iii) **Presentation**
The document submitted for examination must consist of a selection of published articles as well as a substantiated representation in which the grounds for submission and coherency of the work presented is evident.

MEDALS AND PRIZES AWARDED IN THE FACULTY

Name	Donor	Award
A.M. Bosman Medal	Farmers' Weekly	To the most deserving postgraduate student in Animal Science
ABSA Consultants & Actuaries prize	ABSA Financial Services	Best performance in Actuarial Science IAS 712
ABSA Financial Services prize	ABSA Health Care Consultants	Best performance in Actuarial Mathematics IAS 282
ABSA Health Care Consultants prize	ABSA	Best second year BSc (Actuarial Mathematics) student
ABSA Life prize	ABSA Lewens	Best performance in finance and Investment FNI 700
AEASA Prize	Agricultural Economics Association of South Africa	To the best undergraduate student in Agricultural Economics, BSc(Agric), or BCom, who achieves an average mark of at least 70% in Agricultural Economics throughout the years of study
Bruker Prize	Bruker South Africa (Pty) Ltd	For the best achievement in Physical Chemistry on the BSc(Hons) level
Capespan Prize	Capespan International	To the best student in Plant Pathology or Microbiology in the final year of the BSc(Agric) or BSc degree
Department of Chemistry Prize	Department of Chemistry, UP	Best achievement in Chemistry at 100 level. Best achievement in Chemistry at 200 level.
Department of Physics Prize	Department of Physics, UP	Best achievement in Physics at first-year level. Best achievement in Physics at second-year level. Best achievement in Physics at third-year level Best achievement in Physics at BSc(Hons) level.
Dewald Hattingh Book Prize	Mrs ASJ Hattingh	For the best third-year student in Mathematics.
Dr and Mrs Geyer Floating Trophy	Dr and Mrs J W Geyer	Awarded to a student in the Faculty of Natural and Agricultural Sciences for academic excellence as well as other achievement
Entomological Society of Southern Africa prize	Entomological Society of Southern Africa	For the best honours student in Entomology

Name	Donor	Award
Financial Planning Institute Prize	FPI	Best performance in Insurance Science IAS211 & Insurance Science IAS221
Financial Planning Institute Prize	FPI	Best performance in Investments BNG 700
FNB Prize	First National Bank	Best first-year BSc (Financial and Actuarial Mathematics) student
FNB Prize	First National Bank	Best BSc (Hons) (Actuarial Mathematics) Research Project
Genetics Achievement Award	Genetics Department	Awarded to the most outstanding final year BSc student in Genetics, on the condition that they completed at least five Genetics modules at 300-level.
GENSEC Prize	GENSEC	Most outstanding honours student in the Financial Mathematics study programme
Geography lecturers Prize	Lecturers from the Department of Geography, Geoinformatics and Meteorology	To a third-year student in Geography who has achieved the highest overall average for Geography subjects in all three years of study
H.B. Davel Medal	Farmers' Weekly	To the student who completes the BSc(Agric) degree most successfully
Hollard Insurance Prize	Hollard Insurance	Best performance in Actuarial Science AKM 704
J J Veenstra Floating Trophy	Mr J J Veenstra	To the Animal Science student who displays the most zeal in both the theoretical as well as the practical training of the degree
Jan F Celliers Book Prize	Dr IB Celliers	Awarded to the best student in Geology on 100-level in the study programmes Geology, Exploration Geophysics or Environmental and Engineering Geology
Johan and Sophie van Heerden Floating Trophy	Johan and Sophie van Heerden	A student who achieved the highest average mark for Meteorology modules at second and third year level and who passed the third-year level modules in a period of one year
Johan J Theron Trophy	Prof Johan J Theron	The best BSc student with Human Physiology as a major subject (average of second- and third-year modules)

Name	Donor	Award
Koos van der Merwe/ AFMA Prize	Association of Animal Feed Manufacture	To a student in the final year of study for the best achievement in Animal Nutrition at any South African university
Margaretha Mes Medal	Plant Science Department	For the best BSc(Hons) student who obtains the degree with a pass mark of at least 70% and whose essay is based on an aspect of Plant Physiology
Margaretha Mes Memorial Prize	Plant Science Department	For a female Plant Science student with the best average (minimum 70%) over three third-year modules in Plant Science
Medal of the South African Society of Crop Production	South African Society of Crop Production	To the best BSc(Agric) student in Crop Production
Meiring Naudé Medal	Dr S M Naude	For the best student in BSc(Hons) with specialisation in Physics on condition that the student passes with distinction
Merck Merit Award for Biochemistry (Hons)	Merck Chemicals (South Africa)	To the best student who obtains the Honours degree in Biochemistry with distinction
Merck Prize	Merck (Pty) Ltd	Best achievement in Chemistry at 300 level. Best achievement in Analytical Chemistry at 300 level
Metrohm Prize	Metrohm South Africa	To the student who obtained the highest marks above 75% for MSc in Biochemistry
Munich Reinsurance Prize	Munich Reinsurance	Best performance in IAS351 & IAS352
Novartis Prize	Novartis	To the best student in Plant Pathology in the final year of the BSc, BSc(Agric) degree programme
Omnia Fertilizer Award	Omnia Fertilizer Incorporated	To the best final-year student in Plant Production and Soil Science
Outsurance Prize	Outsurance	For the best BSc: Actuarial and Financial Mathematics graduate
Pierre du Plessis Prize	A group of friends and family of the late Pierre du Plessis.	Student in Physics at 300 level, on condition that the student passes with distinction
PPS Prize	PPS	For the best BSc(Hons): Actuarial and Financial Mathematics graduate

Name	Donor	Award
Richards Bay Minerals Junior Prestige Award	Richards Bay Minerals	For best Honours student in Zoology
Richards Bay Minerals Senior Prestige Award	Richards Bay Minerals	For best achievement in Zoology at Master's level
Richards Bay Minerals Senior Prestige Award	Richards Bay Minerals	For best achievement in Zoology at doctoral level
Rüsch and Van Biljon-Prize	Pieter Rüsch and Gert van Biljon	For the final-year project by a BEng or BSc(Agric) student that shows the best economic potential
SA Genetics Society Hofmeyer-Van Schaik Prize	South African Genetics Society	To the best BSc(Agric) or BSc(Hons) student in the fourth year of study who achieves a final mark of at least 75% in Genetics
SA Mathematical Society Bronze Medal	SA Mathematical Society	Best honours student in Mathematics or Applied Mathematics.
SAAB Junior Medal for Plant Science	South African Association for Plant Science	For the best doctoral thesis submitted at a South African university by a person not older than 35 years
SAAFoSt Academic Merit Award	South African Association for Food Science and Technology	To the most outstanding student in the final year of the BSc(Agric) degree with specialization in Food Science
Sanlam Prize for Statistics	Sanlam	For the best achievement in Statistics at 300 level
Sanlam Prize for project work in Statistics	Sanlam	For the best project work in Statistics at 300 level
Sanlam Prize for Mathematical Statistics	Sanlam	For the best achievement in Mathematical Statistics at 300 level
Sanlam Prize for the project work in Mathematical Statistics	Sanlam	For the best project work in Mathematical Statistics at 300 level
SAPBA Prize	South African Plant Breeders Association	To the best final-year student in Plant Breeding
SASAS Prize	South African Society of Animal Science	To the most outstanding under-graduate in Animal Science
SASAS Prize	South African Society of Animal Science	To the most outstanding postgraduate student(s) in Animal Science at master's and doctoral level at any South African university

Name	Donor	Award
SASAS Transvaal Branch Award	South African Society of Animal Science	To the most outstanding student in the third year of study in Animal Science
SASDT Meritorious Award	South African Society of Dairy Technology	To a student in the department of Food Science who achieves outstanding academic results, and who displays exceptional enthusiasm for the dairy component of the syllabus
Sasol Prize	Sasol Ltd	Best achievement in Chemistry at 100 level, on condition that the student continues studies in Chemistry. Best achievement in Chemistry at 200 level, on condition that the student continues studies in Chemistry. Best achievement in Chemistry at 300 level. Best achievement in Chemistry at BSc(Hons) level.
Schutte & Associates Prize	Schutte & Associates	Best performance on second year level in compulsory modules in the Insurance & Actuarial Sciences
Schweickerdt Medal for Plant Science	The late Prof H G W J Schweickerdt	To the best BSc(Hons) student who obtained the degree with a pass mark of at least 70% and whose essay is based on an aspect of Plant Science other than Plant Physiology
Zoological Society of Southern Africa Prize	Zoological Society of Southern Africa	To the Honours student who obtains the BSc(Hons) degree with the highest average mark.
Zoological Society of Southern Africa Prize	Zoological Society of Southern Africa	To the best student in Zoology at 300 level
Department of Consumer Science		
Bernina Achievement Prize	Bernina Saskor, JHB	Achievement in Garment Construction (Theory and Practice).
Bernina Achievement Prize	Bernina Saskor, JHB	Best achievement in Interior Construction
Bernina Prestasie Prize	Bernina Saskor, JHB	Best achievement in Garment Construction 310 (design talent and creativity)
Husqvarna Prestasieprys	Nordic Sewing Machines	Best achievement in both the modules VLG 310, 320

Name	Donor	Award
Rees Mann Prestasieprys	Mannettes, JHB	Best student in the commercial component of Garment Construction 310
Award in Agrarian Extension		
Bronze Medal of Honour from the South African Society for Agri-cultural Extension	South African Society for Agricultural Extension	To the best Honours student in Agricultural Extension
Wildlife Management		
Van Schaik Prize in Wildlife Management	J L van Schaik Publishers	For the best achievement by a BSc(Hons) student in the final examination with specialization in Wildlife Management
Welder Wildlife Foundation Merit Award	Centre for Wildlife Management	To the best BSc(Hons) student with specialisation in Wildlife Management (Specific conditions apply)
Not limited to the Faculty of Agricultural and Natural Sciences		
Award of the Vice-Chancellor and Principal		The award consists of a silver medal as well as a prize and certificate and is awarded to candidates for outstanding undergraduate academic achievement during all the undergraduate years of study for any first bachelor's degree in a faculty.
SRC Honorary Medal	Student Representative Council	Student who delivered the best service to the community.
S_2 A_3 Bronze Medal	South African Society for the advancement of science (sponsored by Sentrachem Ltd)	To a student who completed an extremely good master's study in the field which is traditionally part of the activities of the South African Society for the Advancement of Science (S_2 A_3) members of the Convocation of the University of Pretoria.

The Afrikaans text of this publication is the official version and will be given precedence in the interpretation of the content.