RULE BOOK **2021** Qwaqwa Campus

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UNIVERSITY OF THE
FREE STATE
UNIVERSITEIT VAN DIE
VRYSTAAT
YUNIVESITHI YA
FREISTATA

UFS·UV
NATURAL AND
AGRICULTURAL SCIENCES
NATUUR- EN
LANDBOUWETENSKAPPE

FACULTY OF NATURAL AND AGRICULTURAL SCIENCES

RULE BOOK 2020

Qwaqwa Campus

UNIVERSITY OF THE FREE STATE
UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA
QWAQWA CAMPUS

UFS UV

Content

1. USING THE RULE BOOK

The Rule Book contains information that will enable students to plan their undergraduate as well as postgraduate studies in the Faculty of Natural and Agricultural Sciences, University of the Free State (UFS). The information can be divided into three sections, namely general administrative information, academic learning programmes and module content.

In the first section students will find:

- Contact details of the academic administration officials in the Dean's office and at the student administration in the George du Toit Administration Building.
- Contact details of the different programme directors where students can get academic advice and assistance when choosing an appropriate learning programme.
- Qualification types, the structure and the constitution of the qualifications.
- Core competencies for graduates.

The second section consists of:

- Faculty rules.
- Qualifications offered by the Faculty.
- Learning programmes for different qualifications.
- Transitional Rules.

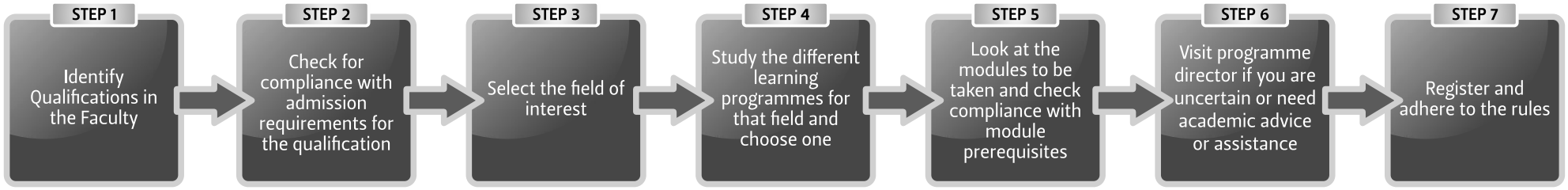
The third section contains module content information:

- Department in which modules are offered.
- Module code, NQF Level, number of credits and Classification of Educational Subject Matter (CESM) categories.
- Prerequisites, module name and contact sessions.
- Content of the module and the method of assessment.

The Rule Book describes students' rights and obligations. The academic programmes must be regarded as part of the agreement between the Faculty and the students. Students registering for a programme in the Faculty must adhere to the General Rules For Undergraduate Qualifications, Postgraduate Diplomas, Bachelor Honours Degrees, Master's Degrees, Doctoral Degrees, Higher Doctorates, Honorary Degrees and the Convocation (General Rules) as well as the Rules of the Faculty of Natural and Agricultural Sciences. Students will only be allowed if space is available to register if they comply with all the admission requirements.

It is important to note that even though the outcomes of academic programmes will remain unchanged from the first time of registration, changes to learning programmes, modules and module content may occur so that the Faculty of Natural and Agricultural Sciences can ensure the relevance of the degrees. Students must therefore consult the new Rule Book every academic year before registration to ensure alignment with updated curricula, as the Faculty updates the Rule Book to keep abreast of the latest scientific developments as well as national directives. It is the student's **responsibility** to be fully conversant with these rules.

Students need to follow these steps when determining the modules for which they have to register:



2. CONTACT DETAILS: OFFICE OF THE DEAN AND ACADEMIC ADMINISTRATION – BLOEMFONTEIN CAMPUS

POSITION	DEAN	FACULTY MANAGER	LEARNING AND TEACHING MANAGER	MARKETING MANAGER	PERSONAL ASSISTANT TO THE FACULTY MANAGER	PERSONAL ASSISTANT TO THE LEARNING & TEACHING MANAGER	NATURAL SCIENCES UNDERGRADUATE	NATURAL SCIENCES POSTGRADUATE
Name	Prof. Danie Vermeulen 	Vacant 	Ms. Elzmarie Oosthuizen 	Ms. Elfrieda Lötter 	Ms. Heidiry White 	Mrs. Sally Visagie 		
Buildiing	Room 9A, Biology Building	Room 9A, Biology Building	Room 9A, Biology Building	Room 9A, Biology Building	Room 9A, Biology Building	Room 9A, Biology Building	George du Toit Administration Building	George du Toit Administration Building
Telephone Number	051 401 2482	051 401 3199	051 401 2934	051 401 2531	051 401 3236	051 401 3855	051 401 9666	051 401 9666
E-mail	dean@ufs.ac.za	isaacstl@ufs.ac.za	oosthuizenem@ufs.ac.za	lottere@ufs.ac.za	whitehj@ufs.ac.za	visagier@ufs.ac.za	studentadmin@ufs.ac.za	studentadmin@ufs.ac.za

3. CONTACT DETAILS

3.1 PROGRAMME DIRECTORS – BLOEMFONTEIN CAMPUS

PROGRAMME	AGRICULTURAL SCIENCES: AGRICULTURAL ECONOMICS	ANIMAL WILDLIFE AND Grassland SCIENCES	SOIL CROP AND CLIMATE SCIENCES	EXTENDED AND AGRICULTURAL SCIENCES	SUSTAINABLE AGRICULTURE	DISASTER MANAGEMENT	ARCHITECTURE	BIOCHEMISTRY
Name	Dr Frikkie Maré	Dr Mike Fair 	Dr Elmarie van der Watt 	Mr. Elrich Jacobs 	Dr Johan van Niekerk 	Dr Johannes Belle 	Mr. Kobus du Preez 	Dr Frans O'Neill 
Building	Room 1.103 Agricultural Building	Room LG3.G02, Agricultural Building	Room LG1.204, Agricultural Building	Room G19.1, Agricultural building	Room LG 3.107, Agriculture Building	Room LG3.106, Agriculture Building	Room 26 ARG105, Architecture Building	Room A7, Biotechnology Building
Telephone Nr	051 401 2824	051 401 9056	051 401 2713	051 401 3726	051 401 3765	051 401 9702	051 401 2332	051 401 7553
E-mail	MareF@ufs.ac.za	FairMD@ufs.ac.za	vdWattE@ufs.ac.za	jacobses@ufs.ac.za	vNiekerkJA@ufs.ac.za	BelleJA@ufs.ac.za	dPreezJL@ufs.ac.za	oneillFH@ufs.ac.za

PROGRAMME	BOTANY, PLANT BREEDING, PLANT HEALTH ECOLOGY, PLANT PATHOLOGY	COMPUTER SCIENCE & INFORMATICS	CONSUMER SCIENCE	ENVIRONMENTAL MANAGEMENT	FORENSIC SCIENCE	GENETICS AND BEHAVIORAL GENETICS
Name	Prof. Botma Visser 	Mr. Jaco Marais 	Dr Ismari van der Merwe 	Mrs. Marinda Avenant 	Dr Karen Ehlers 	Mrs. Zurika Murray 
Building	Room 134, Biology Building	Room 212, Mathematical Sciences Building	Room LG 9.107, Agriculture Building	Room LG10.103, Agriculture Building	Room BL.169, Biology Building	Room 6, Genetics Building
Telephone Nr	051 401 3278	051 401 2929	051 401 2598	051 401 2863	051 401 3978	051 401 2776
E-mail	visserb@ufs.ac.za	maraisj@ufs.ac.za	lvdMerwe@ufs.ac.za	avenantmf@ufs.ac.za	ehlersk@ufs.ac.za	MurrayZ@ufs.ac.za

PROGRAMME	GEOHYDROLOGY	MATHEMATICAL SCIENCES	MATHEMATICAL STATISTICS AND ACTUARIAL SCIENCE	MICROBIOLOGY, MICROBIAL BIOTECHNOLOGY	GEOGRAPHY	GEOLOGY
Name	Dr Amy Allwright 	Dr Christiaan Venter 	Dr Michael J. von Maltitz 	Prof. Koos Albertyn 	Mrs. Eldalize Kruger 	Mrs. Justine Magson 
Building	Room 21, Institute for Groundwater studies (IGS)	Room WWG 121, Mathematical Sciences Building	Room W102, Mathematical West Block	Room C101, Biotechnology Building	Room GEO 2.2, Geography Building	Room GG 305, Geology Building
Telephone Nr	051 401 3481	051 401 2320	051 401 2609	051 401 2223	051 401 2185	051 401 2373
E-mail	AllwrightAJ@ufs.ac.za	venterc@ufs.ac.za	vmaltitzmj@ufs.ac.za	albertynj@ufs.ac.za	krugere@ufs.ac.za	MarkramJ1@ufs.ac.za

PROGRAMME	PHYSICS, CHEMISTRY	QUANTITY SURVEYING AND CONSTRUCTION MANAGEMENT	QUANTITY SURVEYING AND CONSTRUCTION MANAGEMENT	URBAN AND REGIONAL PLANNING	EXTENDED NATURAL SCIENCES	ZOOLOGY AND ENTOMOLOGY
Name	Dr Johan Venter 	Mrs. Tascha Bremer 	Mr Hendri du Plessis 	Dr Kgosi Mocwagae	Mr. Pieter Bothma 	Dr Candice J van Rensburg 
Building	Room CEM101, Chemistry Building	Room 12, Quantity Surveying and Construction Management	Room 7, Quantity Surveying and Construction Management	Room 26, Urban and Regional Planning	Dean's Office: Natural and Agricultural Sciences	Room D119A, Biology Building
Telephone Nr	051 401 3336	051 401 2996	051 401 9624	051 401 2795	083 542 9995	051 401 9357
E-mail	venterja@ufs.ac.za	BremerT@ufs.ac.za	DuPlessisHB@ufs.ac.za	MocwagaeKS@ufs.ac.za	BothmaPJ@ufs.ac.za	JvRensC@ufs.ac.za

3.2 ACADEMIC ADMINISTRATION AND PROGRAMME DIRECTORS – QWAQWA CAMPUS

PROGRAMME	ASSISTANT DEAN QWAQWA	FACULTY OFFICER: QWAQWA	EXTENDED NATURAL SCIENCES	BIOLOGICAL SCIENCES	MATHEMATICS AND COMPUTER SCIENCE AND INFORMATICS	PHYSICS, CHEMISTRY
Name	Prof Aliza le Roux 	Mrs. Dilahlwane Mohono 	Vacant	Dr Tom Okello 	Mr. Teboho Lesesa 	Dr Richard Ocaya 
Building	Room 1008, Old Natural Science Building	Room 1012/2	Room NAS111, New Natural Science Building	Room 109, New Natural Science Building	Room LB 2014, Library Building	Room 0009, New Science Building
Telephone Number	058 718 5313/5314	058 718 5284	058 718 5207	058 718 5478	058 718 5235	058 718 5301
E-mail	lerouxa3@qwa.ufs.ac.za	mohonodm@ufs.ac.za		okellotw@ufs.ac.za	lesesaT@ufs.ac.za	ocayaRO@ufs.ac.za

4. ACADEMIC STAFF

	AGRICULTURAL ECONOMICS (051 401 2824)	**ANIMAL SCIENCES** (051 401 2211)	**SOIL, CROP AND CLIMATE SCIENCES** (051 401 2212)
Professor		***Prof. F.W.C. Neser,** Prof. G.N. Smit, Prof. A. Hugo	Prof. C.W. van Huyssteen
Senior Professor	Prof. A.K. Chapagain		
Professors Extraordinary		Prof. M.M. Scholtz	
Associate Professor	Prof. B. Grové, Prof. H. Jordaan, Prof. Y.T. Batha		***Prof. A.C. Franke,** Prof. J.J. Van Tol
Affiliated Professors		Prof. H.A. Snyman, Prof. J.B. van Wyk, Prof. J.P.C Greyling	Prof. S. Walker, Prof. M. Savage, Prof. C.C. du Preez
Affiliated Associate Professor		Prof. F.B. Bercovitch, Prof. V.P Ducrocq, Prof. M.D MacNiel, Prof. Linky Makgahlela, Prof. Norman Maiwashi, Prof. HO de Waal; Prof. TL Nedambale	Prof. R. van Antwerpen
Senior Lecturer	***Dr F.A. Maré,** Dr N. Matthews, Dr A.A. Ogundeji, Dr J.I.F. Henning, Dr W.A. Lombard	Dr M.D. Fair, Dr F. Deacon, Dr F.H. de Witt, Dr H.A. O'Neill, Dr E.D. Carson, Dr O.B. Einkamerer, Dr J. Myburgh	Dr J.H. Barnard, Dr G.M. Ceronio, Dr N Mashingaidze, Dr G.M. Coetzer, Dr E. Kotzé, Dr E.van der Watt
Lecturers	Mr P. Mokhatla, Mr H.N. van Niekerk, Ms P Mohlotsane	Dr P.J. Malan, Mr L. Kruger, Dr B.B. Janecke, Mrs G.C. Josling, Me R. Grobler	Dr M.P Aghoghovwia, Ms L. de Wet Dr A.S. Steyn, Dr W.A Tesfuhuny, Mr P.C. Tharaga,Mr J. Dlamini, Ms V.N. Mathinya
Junior Lecturers	Ms Z. Coka	Mr G. Janse van Rensburg, Ms J. Paulse, Mr J. Barnard	
Junior Researcher	Ms P. Madende		
Research Associate	Dr B. Riddout, Prof M.Bergman, Dr DB Strydom		
Senior Researcher			
Affiliated Researcher	Mr P. Oosthuizen		
Agricultural Engineering	Mr J.J. van Staden		

	ARCHITECTURE (051 401 2332)	**QUANTITY SURVEYING AND CONSTRUCTION MANAGEMENT** (051 401 3322)	**URBAN AND REGIONAL PLANNING** (051 401 2486)	**ENGINEERING SCIENCES** (051 401 7665)
Professor	***Prof. J. Noble**		Prof. V.J. Nel	
Associate Professor	Prof. G. Bosman	***Prof. K. Kajimo-Shakantu**	***Prof M.M. Campbell**	Prof H.J. Marx
Affiliated Professor				
Senior Lecturers	Ms M. Bitzer, Ms A. Wagener, Mr J. L. du Preez	Dr C. Amoah, Dr F. Simpeh	Dr T. Mphambukeli, Mr T. Stewart	***Mr L.F. Lagrange**
Lecturers	Mr J.W. Ras, Mr J. H. Nel, Mr H. Raubenheimer, Mr P. Mabe, Dr H. Auret	Mr P.M. Oosthuizen, Ms M. Els, Ms T. Bremer, Mr H. du Plessis, Ms T. van Schalkwyk, Mr A. Deacon, Ms C. Ferreira	Dr K.S. Mocwagae, Mr SP Denoon-Stevens	Mr R.J. Homann
Junior Lecturers	Mr J.I. Olivier, Mr D.P.G. van der Merwe			Mr N.C. Bernstein
Research Fellow	Prof. W. Peters	Dr P.F. Tunji-Olayeni, Dr T.O. Ayodele	Prof I. Chirisa, Prof. JJ Steyn	

	CHEMISTRY (051 401 9212)	**COMPUTER SCIENCE AND INFORMATICS** (051 401 2754)	**GENETICS** (051 401 2595)	**GEOGRAPHY** (051 401 2255)	**GEOLOGY** (051 401 2515)	**MATHEMATICS AND APPLIED MATHEMATICS** (051 401 2691)	**MATHEMATICAL STATISTICS AND ACTUARIAL SCIENCE** (051 401 2311)
Distinguished Professor	Prof. A. Roodt						
Senior Professor						Prof. J.H. Meyer	Prof. M.S. Finkelstein
Adjunct Professor			Prof. J.J. Spies				
Research Fellow	Prof. B.C.B. Bezuidenhoudt, Dr A.A. Adeniyi	Prof. P.J. Blignaut, Dr C. van Staden, Prof. K. Holmqvist, Dr B.A. Senekal			Dr H. Praekelt, Dr P.G. Meintjes, Prof. W.A. van der Westhuizen, Prof. W.P. Colliston, Dr R.J. Giebel		
Professors Extraordinary							
Professors	**Prof. W. Purcell*** Prof. J.C. Swarts, Prof. J. Conradie, Prof. V. Azov, Prof. H.G. Visser		***Prof. J.P. Grobler**		***Prof B. Yibas**	Prof. T. Vetrik	Prof. R. Schall
Associate Professors	Prof. K. von Eschwege, Prof. L. Moskaleva, Prof. E. Erasmus, Prof. A. Brink,	Prof. T. Stott, Prof. P.O. Kogeda, Prof. L. Nel, Prof. L. de Wet, ***Prof. J.E. Kotzé,** Prof. J.A. Venter	Prof. R. Rebello		Prof. F. Roelofse	Prof J. Brink	Prof. A. Verster
Affiliated Professors	Prof. K.J. Swart		Prof. T.E. Turner, Prof. F.E. Zachos		Prof. D.E. Miller, Prof. G.Germs		
Affiliated Associate Professors	Prof. C.R. Dennis		Prof. A. Kotzé, Prof. M.J. van der Merwe, Prof. B.K. Reily		Prof. L. Jacobson, Prof. R. Schouwstra,Prof. CDK Gauert		
Senior Lecturers	Dr S.L. Bonnet, Dr J.A. Venter, Dr E.H.G. Langner, Dr A. Wilhelm, Dr C. Marais		Dr K. Ehlers, Dr G.M. Marx, Dr M. Gryzenhout	***Dr C.H. Barker,** Dr J.J. le Roux	Dr M. Huber, Dr H. Minnaar, Dr R. Hansen		Dr L. van der Merwe, ***Mr F.F. Koning,** Dr D. Chikobvu, Dr M.J. von Maltitz, Dr M. Diko, Dr S. van der Merwe
Senior Lecturer-researcher	Dr M. Schutte-Smith, Dr E. Müller						
Senior Lecturer – Units	Dr. D.V. Kama						
Lecturers	Dr L. Twigge, Dr R. Shago, Mr L.Nkabiti	Dr P. Khomokhoana, Dr W. Nel, Mr R.C. Fouché, Mr W.S.J. Marais, Mr D. Wium, Ms T. Nkalai	Mr M.F. Maleka, Mr J.A. Viljoen, Ms S. Schneider, Ms Z. Murray, Ms H. Bindeman, Ms L. Wessels, Dr S. Brink	Ms E. Kruger, Ms T.C. Mehlomakhulu, Mr A.J. van der Walt, Ms L. Rudolph, Ms M Jacobus	Mr A.I. Odendaal, Ms J. Magson, Ms J. Beukes, Mr M.E. Moitsi, Ms M.E. Dimmick-Touw, Ms R. Makhadi	Ms A.F. Kleynhans, ***Dr C. Venter**, Dr A. Kriel, Dr E. Ngounda, Dr E. Maritz, Dr R. Jansen, Mr G.L. Andrews	Mr A.M. Naudé, Ms E. Girmay, Ms W. Oosthuizen, Ms Z. Ludick, Dr M. Sjölander, Mr J. Blomerus, Ms L. Da Silva, Mr J.L. Voges
Affiliated Lecturers			Lt Col. A. Lucassen, Dr E. Mwenesongole		Ms H.C.F. Pretorius		
Affiliated Researcher							
Junior Lecturers		Ms M. Thakaso, Mr C.A. Cilliers	Ms Z. Raffie		Ms T. Mapholi, Mr W.J. Nel	Ms A. Swart	
Subject Coordinators	Dr R. Meintjes						
Academic Facilitators	Dr M. du Plessis, Ms B. van Tonder, Ms C. de Klerk, Dr R.U. Siegert, Ms L. Siegert						

QWAQWA-CAMPUS

	CHEMISTRY (058 718 5130)	COMPUTER SCIENCE AND INFORMATICS (058-718 5216)	GEOGRAPHY (058-718 5476)	MATHEMATICS AND APPLIED MATHEMATICS (058-718 5204)
Professor			Prof. G. Mukwada	
Associate Professors				
Senior Lecturers	Dr. J.P. Mofokeng	Dr R.D. Wario	***Dr T.W. Okello**	***Dr U.A. Koumba**
Lecturers	Dr N.F. Molefe, Mr T.A. Tsotetsi, Ms M.A. Malimabe, Dr M. Mngomezulu	Mr A.G. Musa, Mr M.B. Mase, Mr G.J. Dollman, ***Mr F.M. Radebe**	Mr P.S. Mahasa, Dr MM Hansen, Ms N.M. Sekhele	Mr S.P. Mbambo, Dr N.R. Loufouma Makala
Junior Lecturers	Mr R.G. Moji	Mr B. Sebastian, Mr T. Lesesa		Ms H.C. Faber
Academic Facilitator	Ms.M. Mbongo			

	MICROBIOLOGY AND BIOCHEMISTRY (051 401 2396)	PHYSICS (051 401 2321)	PLANT SCIENCES (051 401 2514)			ZOOLOGY AND ENTOMOLOGY (051 401 2427)
			Division of Plant Pathology	Division of Botany	Division of Plant Breeding	
Senior Professor		Prof. H.C. Swart, Prof. P.J. Meintjes				
Professor	***Prof. M.S. Smit,** Prof. J.Albertyn, Prof. R.R. Bragg, Prof. B.C. Viljoen, Prof. C.H. Pohl-Albertyn, Prof. H.G. O'Neill, Prof.G.Osthoff, Prof. C.J. Hugo	***Prof. J.J. Terblans,** Prof. W.D. Roos Prof. R.E. Kroon	Prof. W.J. Swart		Prof. M.T. Labuschagne, ***Prof. L. Herselman**	Prof. L. Basson, Prof. N.J.L. Heideman
Professors Extraordinary						Prof. L.J. Fourie
Associate Professors	Prof. D. Opperman, Prof. O.M. Sebolai	Prof. M.J.H. Hoffman Prof. E. Coetsee-Hugo	Prof. W.H.P. Boshoff	Prof. B. Visser		***Prof. L.L. van As**, Prof. C.R. Haddad, Prof. D. Codron
Affiliated Professors			Prof. P. Crous			
Affiliated Associate Professors	Prof. E.J. Lodolo, Prof. A. Valverde Portal	Prof. K.T. Hillie, Prof. G. Mhlongo, Prof.D. Motaung			Prof. M. Zhou	
Senior Lecturers	Dr F.H. O'Neill	Dr R.A. Harris, Dr B. van Soelen, Ms H. Szegedi	Dr G.J. Marais	Dr J. Moloi, Dr L. Mohase, Dr L. Joubert, Dr A.C. van Aardt	Dr A. van Biljon, Dr A. Minnaar-Ontong, Dr R. van der Merwe	Dr V.R. Swart
Affiliated Senior Lecturer	Dr S. Bareetseng					
Lecturers	Dr. O. Gcilitshana, Dr C. Tolmie Ms L. Steyn	Dr A. Odendaal, Dr S. Cronjé	Dr L.A. Rothmann	Dr M. Jackson, Dr M. Mafa	Dr N.W. Mbuma, Dr A. Maré	Ms E.M.S.P. van Dalen, Mr H.J.B. Butler, Dr C. Jansen van Rensburg, Ms L. Heyns
Junior Lecturers						Mr D Fourie
Research Associates	Dr C.E. Boucher		Prof. Z.A. Pretorius Prof. N.W. McLaren	Dr A.M. Venter, Prof H.J.T. Venter, Dr M.C. Cawood	Dr S. Ramburan	Dr L.M. Barkhuizen, Dr L.Hugo-Coetzee, Dr Y. Marusik, Dr M.F. Bates
Senior Researcher	Dr G. Kemp			Prof. L. Scott (Mentor)		
Researcher		Dr M. Duvenhage				
Junior Researcher		Mr L.J.B. Erasmus				

QWAQWA-CAMPUS

	PHYSICS (058 718 5302)	PLANT SCIENCES (058 718 5332)	ZOOLOGY AND ENTOMOLOGY (058 7185324)
		Botany	
Professor	Prof. B.F. Dejene		
Associate Professor	Prof. L.F. Koao, Prof. R.O. Ocaya		Prof A. le Roux
Senior Lecturers	***Dr K.G. Tshabalala,** Prof. A.O.T. Ashafa	Dr S.L. Steenhuisen, Dr R. Ngara, Dr A. Gokul	Dr P. Voua Otomo, Dr E. Bredenhand
Lecturers	Dr S.J. Motloung	Mr T.R. Pitso, Dr P.J. Mojau	***Dr J. van As**, Ms M. van As, Dr N. Nyembe, Dr M. Ramoejane
Research Associates		Prof. R.O. Moffett, Dr L.V. Komoreng, Dr R.J. McKenzie, Dr T.M. Mokotjomela, Dr T. Ramakuwela	
Affiliated Researcher			
Academic Facilitator			

	DiMTEC (051 401 2721)	SUSTAINABLE FOOD SYSTEMS AND DEVELOPMENT (051 401 2163)	CENTRE FOR ENVIRONMENTAL MANAGEMENT (051 401 2863)	INSTITUTE FOR GROUNDWATER STUDIES (051 401 2175)
Director	***Dr J Belle**	***Prof J.A. van Niekerk**	***Prof. P. Oberholster**	***Mr E Lukas**
Professor	Prof. R. Bragg	Prof. M. de Wit		Prof. P.A.L. le Roux, Prof. A Atangana
Associate Professor	Prof. B. Grové		Prof. O.O. Ololade	
Affiliated Professors	Prof. J. Szarzynski		Prof. A. Turton	
Affiliated Associate Professors	Prof. A Ozuno, Prof. F.G. Renaud		Prof. N.A. Kgabi	Prof. K.T. Witthüser
Affiliated Researchers	Prof. A. Jordaan			Prof. J.F. Botha, Dr Y.L. Kotze
Senior Lecturer/ Senior Researcher	Dr. A.O. Ogundeji, Dr H. Booysen, Dr D. Kama, Dr J. Belle, Dr A. Ncube, Dr M Khangale, Dr M. Coetzee	Prof. J Van Rooyen, Prof. E.M. Zwane, Dr. D. Nthakheni, Dr. K. Tshikolomo, Dr. A. Sonandi, Dr. H. Smit, Dr. J. Pakhizela, Dr. N. Fouché, Mr. T. Lukhalo, Mr. J Van Den Berg Miss. K. Thobejane, Dr J.W. Swanepoel, Me J.H. Ngwenya, Dr C. Bothma,	Dr F.T. Buschke, Dr S. Esterhuyse	Dr F.D Fourie, Prof. M. Gomo
Lecturers	Ms O. Kunguma, Ms. L. de Wet, Mr W.F Ellis, Dr BH Moeketsi, Mr. M Serekoane, Ms G Du Toit, Dr D.T. Raphela, Ms V.Z. Poto, Ms M. Joubert, Mr Y.S. Nyam	Dr I. van der Merwe, Dr J.F. Vermaas, Dr N. Cronje, Dr N. Tinta	Ms M. F. Avenant	Dr S.S. de Lange, Mr P.H. Lourens, Dr A. Allwright
Junior Lecturers	Ms L. Nogabe, Ms. D Banyane	Miss. A. Silwana, Mrs. K. Green		
Lecturers/Researchers				
Research Associates		Prof. A.E. Nesumvuni, Dr. B.D. Nkosi, Dr. E.M. Zwane, Dr. P Tirivanhu, Dr. J. Codron, Prof B VanSchoenwinkel, Dr M Thwala	Dr N.L. Avenant, Dr N.B. Collins, Dr P. Grundlingh, Dr J.R. Henschel, Dr S. Mitchell, Dr T. Pinceel, Prof. M.T. Seaman, Dr D.F. Toerien, Dr P.C. Zietsman	

*** Academic Departmental Head**

5. REVISED QUALIFICATION TYPES AND DEGREE CODES

Higher Education Qualifications Sub-Framework (HEQSF) contains eleven qualification types mapped on to the six levels of the National Qualifications Framework (NQF) offered by higher education institutions. Some levels have more than one qualification type. The following qualification types are presented at the Faculty of Natural and Agricultural Sciences, UFS:

UNDERGRADUATE QUALIFICATIONS				POSTGRADUATE QUALIFICATIONS			
Type of qualification	**Exit level**	**Minimum total credits**	**Credits and level**	**Type of qualification**	**Exit Level**	**Minimum total credits**	**Credits and level**
Advanced Diploma	7	120	Minimum 120 credits at Level 7	Postgraduate Diploma	8	120	Minimum 120 credits at Level 8
Bachelor's Degree	7	360	Minimum 120 credits at Level 7	Bachelor Honours Degree	8	120	Minimum 120 credits at Level 8
Professional Bachelor's Degree	8	480	Minimum 120 credits at Level 8	Master's Degree	9	180	Minimum 180 credits at Level 9
				Doctoral Degree	10	360	Minimum 360 credits at Level 10

Each of these qualifications are registered with South African Qualifications Authority (SAQA) and Department of Higher Education and Training (DHET) and are linked to a unique degree code on the Programme and Qualification Mix (PQM) of the University of the Free State.

Table 1: Degree Codes

First	**Second**				**Third**				**Fourth**
Faculty	Exit level qualifier				Faculty specific				
4 - Natural Sciences 5 – Agriculture Sciences	1-4 Undergraduate		5-9 Postgraduate		**Natural Sciences**				Degrees with designator 0 = old and 1 = reviewed.
	*Certificates (Higher/ Advanced)	1	*Honours degree	6	Biological Sciences	1	Computer Science and Informatics	6	
	*Diplomas (360-credits/240-credits/ Advanced)	2	*Master's degree (Course work/ Professional)	7	Mathematical Sciences	2	Consumer Science	7	
	*B-degree (360-credit)	3	*Master's degree (Dissertation)	8	Chemical and Physical Sciences	3	Agricultural Sciences	8	
	*B-degree (480-credit)	4	*Doctorate (Research)	9	Geosciences	4	Building Sciences	9	
	*Postgraduate Diploma	5	*Doctorate (Professional)	0	Agricultural Economics	5	Other	0	

6. CONSTITUTION OF QUALIFICATIONS AND PROGRAMME CODES

The majority of the Bachelor's Degrees on offer at the Faculty of Natural and Agricultural Sciences consists of three years of study. The first year of study provides students with the opportunity to develop a broad scientific foundation and students are normally required to complete eight modules (at least 120 credits per year, four modules per semester). These modules serve as the foundation for specialisation in the subsequent years. In the second year of study, majors are selected (at NQF Level 6), supplemented with modules from supportive disciplines. Learning programmes provide students with the opportunity to select modules from related supportive disciplines to ensure purposeful qualifications. In the third year of study, students must specialise in two major fields of study, for example Physics and Chemistry, or Microbiology and Biochemistry, or Genetics and Botany (at NQF Exit Level 7), with a total of at least 60 credits completed for each major. Furthermore, students may also be required to complete other modules to ensure that they have the necessary knowledge and literacy required to function in a demanding academic environment. The diagram below indicates how degrees are constituted and how one qualification provides entry into a qualification at the next NQF Level.

The Bachelor's Degree (B) makes provision for four fields of study, namely:	The Bachelor of Science (BSc) and the Bachelor of Science Honours Degree make provision for seven fields of study, namely:		The Bachelor of Science in Agricultural BSc (Agriculture) Degree makes provision for four fields of study, namely:
• Architecture • Agricultural Sciences • Consumer Sciences • Computer Information Systems	• Biological Sciences • Building Sciences • Chemical and Physical Sciences • Consumer Science	• Geosciences • Computer Science and Informatics • Mathematical Sciences	• Animal, Grassland and Wildlife Sciences • Food Science • Plant Breeding and Plant Pathology • Soil, Crop and Climate Sciences

In each field of study different modules can be combined as majors. The different combinations of majors, minors and supportive modules are referred to as learning programmes. The combination of modules are known as the curriculum for the specific learning programme and must comply with the minimum credits as indicated under the heading *5. Revised Qualification Types and Degree Codes.* Each learning programme has a unique Programme Code, which refers to a qualification on the UFS PQM, accredited by the CHE, and registered with SAQA and DHET and link to a specific Degree Code.

Table 2: Programme codes

First Digit	Second Digit	Third Digit					
Campus	**Faculty**	**Exit level qualifier**					
		1-4 Undergraduate			**5-9 Postgraduate**		
B – Bloemfontein Q – Qwaqwa	4 – Natural Sciences 5 – Agricultural Sciences	Certificates (Higher/ Advanced)	1	Postgraduate Diploma	5	Master's Degree (Dissertation)	8
		Diplomas (360-credits/240-credits/ Advanced)	2	Honours Degree	6	Doctorate (Research)	9
		B-degree (360-credit)	3	Master's Degree (Course work/ Professional)	7	Doctorate (Professional)	0
		B-degree (480-credit)	4				

Fourth Digit						Fifth Digit	
Natural Sciences fields of study				**Agriculture fields of study**				**Detail qualifiers**	
Biological Sciences	1	Computer Science and Informatics	6	Animal, Grassland and Wildlife Sciences	1	Agricultural Economics	5	All degrees except the ones listed below are zero (0)	0
Mathematical Sciences	2	Consumer Science	7	Food Science	2	Agricultural Management	6	Selection programmes with different admission requirements	1
Chemical and Physical Sciences	3	Agricultural Sciences	8	Plant Breeding and Plant Pathology	3	Agricultural Extension	7		
Geosciences	4	Building Sciences	9	Soil, Crop and Climate Sciences	4				
Agricultural Economics	5	Other	0						

7. ACADEMIC PLAN CODES

The coding system links to another level, the Academic Plan Code. This code consists of eight digits. The first four digits respond directly with the first four digits of the Degree Code. The last digits link to the different degrees as follows:

Advanced Diploma	BC4200xx	Bachelor of Science Agriculture	BC54xxyy	Master's by dissertation	BC4802xx	Doctor	BC4902xx
Advanced Diploma Agric.	BC5200XX	Bachelor Honours	BC4600xx	Master's by course work	BC4703xx	Doctor of Philosophy	BC4900xx
Bachelor	BC4301xx	Bachelor of Science Honours	BC5600xx	Master of Science by dissertation	BC4800xx	Doctor of Science	BC4901xx
Bachelor of Science (xx and yy represent the TWO different majors	BC43xxyy	Postgraduate Diploma	BC4500xx	Master of Science by course work	BC4701xx		
		Postgraduate Diploma Agric.	BC5500xx	Master of Agricultural Sciences	BC5800xx		
				Master of Agricultural Sciences Structured	BC5702xx		

Bachelor of Science Extended Degree	**Bachelor of Science Agricultural Extended Degree**	**Bachelor of Agriculture Extended Degree**	**University Access Programme**
Mathematics and Chemistry BC4300E1 Mathematics and Finances BC4300E2	Mathematics and Chemistry BC5480E1	Agriculture BC5300E1	Mathematics and Chemistry 40001 Agriculture 50001 **Higher certificate in NAS** HCert in Mathematics and Chemistry BC410001* HCert in Agriculture BC510001*

**If available on Programme Qualification Mix.*

The first digits that indicate the degree can include one of the two digits representing a major. The subsequent digits represent either the selected two majors, or the major and minor in the case of the Bachelor of Science Agriculture degrees, or a single speciality area in the case of Bachelor Honours, Master's and Doctoral degrees. Each subject is identified by a two-digit code as provided in the table below.

Table 3: Identification codes of different disciplines

Actuarial Science	10	Behavioural Genetics	18	Engineering Science	26	Geohydrology	34	Plant Pathology	42
Agricultural Economics	11	Biochemistry	19	Entomology	27	Geology	35	Quantity Surveying	43
Agrometeorology	12	Botany	20	Environmental Geology	28	Grassland Science	36	Soil Science	44
Agronomy	13	Chemistry	21	Food Science	29	Mathematical Statistics	37	Spatial Planning	45
Architecture	14	Computer Science and Informatics	22	Forensic Science	30	Mathematics	38	Statistics	46
Animal Science	15	Consumer Science	23	Genetics	31	Microbiology	39	Sustainable Agriculture	47
Applied Mathematics	16	Construction Management	24	Geochemistry	32	Physics	40	Urban and Regional Planning	48
Astrophysics / Astronomy	17	Disaster Management	25	Geography	33	Plant Breeding	41	Zoology	49

Table 4: Identification codes of specialisation fields

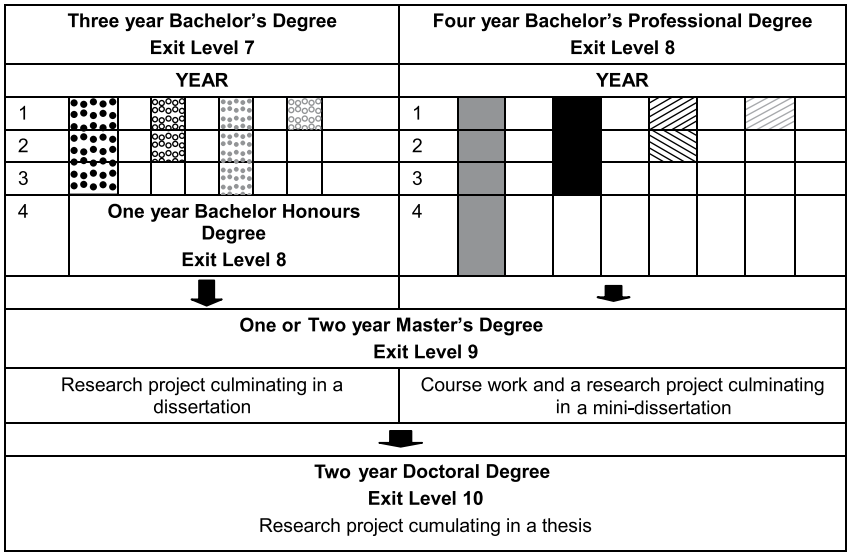
Alternative combination	00	Economics	58	Forensic Sciences Interdiciplinary	68	Mineral Resource Management	78	Risk analysis	87
Program without two majors	1-9	Environmental Geography	59	Geographical Informatics	69	Nano Sciences	79	Soil Science Interdisciplinary	88
Agricultural Engineering	51	Environmental Management	60	Human Settlements	71	Physiology	80	Wildlife	89
Agrometeorology Interdisciplinary	53	Environmental Science	62	Irrigation Management	72	Plant Breeding Interdisciplinary	81	Wildlife Management	90
Agronomy Interdisciplinary	54	Facilities Management	63	Irrigation Sciences	73	Plant Health Ecology	82	Integrated Water Management	91
Business Management	55	Finance	64	Land and Property Development Management	74	Plant Pathology Interdisciplinary	83	Tourism	92
Computer Information Systems	56	Forensic Chemistry	65	Life Sciences	75	Polymer Sciences	84	Conservation Biology	94
Ecology	57	Forensic Entomology	66	Limnology	76	Property Sciences	85	Data Science	95
Economics	58	Forensic Genetics	67	Microbiotechnology	77	Psychology	86		

The curricula for the different learning programmes usually consist of three types of modules, namely compulsory, elective and required modules. Compulsory modules must be taken by all the students in the learning programme; elective modules provide students with the opportunity to select modules of interest; and required modules must be followed when a student does not comply with certain requirements. The curricula for the different learning programmes are set out below, starting on p.49.

8. STRUCTURE OF QUALIFICATIONS

COMPOSITION OF THREE AND FOUR YEAR DEGREES

The different blocks represent different modules; if the blocks have the same colour they represent the same discipline.



MODULE CODES

Undergraduate and postgraduate modules may be presented as semester or year modules. The credits awarded to every module give an indication of the teaching and learning time and volume of work. One module credit equals 10 notional hours which include hours spent in the lecture room and on independent work and study.

A module is indicated with the code ABCDwxyz and this code represents the following:

ABCD	Indicates the discipline
w	A numeral stating the study year, for example first year = 1
x	Indicate NQF Level
y	An odd number indicates the first semester and an even number indicates the second semester. The numerals 0 indicates a year module
z	The number multiplied by four indicate the number of credits

For example, CROP3754 indicates that it is an Agronomy module (CROP), presented during the third academic year at NQF Exit Level 7 (3), that the module is presented during the first semester (odd number 5), and represents 4x4 = 16 teaching credits (4).

The numerical code for Bachelor Honours, Master's and Doctorate modules will start with a 6, 7 for structured or 8 research and 9. If the last number is 0 it indicates that the modules have either more than 36 credits or the credits are not a multiple of four.

9. CORE COMPETENCIES FOR GRADUATES

A Bachelor's or Bachelor of Science Graduate is:

Academically excellent	Adjusted to cultural diversity	An active global citizen
This entails that the student:		
• Attains a strong sense of academic integrity and scholarship. • Becomes self-motivated and self-regulated, with an ability to continuously direct his/her own learning. • Adapts to a changing environment and becomes committed to lifelong learning. • Accepts critical thinking and decision-making as part of the learning process. • Attains an appropriate level of achievement in language proficiency, reading and writing, problem solving, communication and broad research activities. • Becomes competent in information and communication technologies. • Develops cognitive and analytical skills that are flexible and transferable through various learning experiences.	• Acquires an understanding of the social and cultural diversity in our country. • Learns to value and respect different cultures.	• Acquires an appreciation of the global perspective on his/her chosen discipline(s). • Learns to accept social responsibilities. • Works effectively both as a team leader and a team member. • Takes cognissance of existing social, economic, political and environmental issues. • Encourages the improvement and sustainability of the environment. • Respects human rights, attaches importance to equity and values, ethics and ethical standards.
Knowledge	**Skills**	**Values and attitudes**
A B or BSc Graduate has the following:		
• Integrated, comprehensive knowledge of the main areas within the two major disciplines of choice. This includes an understanding of, and an ability to apply and evaluate, the key terms, concepts, facts, principles, rules and their theories. • Detailed knowledge of at least one area of specialisation and how that knowledge relates to other fields, disciplines or practices. • An understanding of contested knowledge and an ability to evaluate types of knowledge and explanations typical of the discipline.	• An understanding of a range of enquiry methods in a field, discipline or practice, and their suitability to specific investigations. • An ability to apply a range of methods to resolve problems or introduce change within a practice. • An ability to identify, analyse, critically reflect on and address complex problems, applying evidence-based solutions and theory-driven arguments. • An ability to make decisions and act ethically and professionally, and the ability to justify these decisions and actions drawing on appropriate ethical values and approaches within a supported environment. • An ability to manage processes in unfamiliar and variable contexts, recognising that problem solving is context- and system-bound, and does not occur in isolation.	• An ability to accurately identify, evaluate and address own learning needs in a self-directed manner, and facilitate collaborative learning processes. • An ability to take full responsibility for own work, decision making and use of resources and limited accountability for the decisions and actions of others in varied or ill-defined contexts. • An ability to develop appropriate processes of information gathering for a given context or use. • An ability to independently validate sources of information, and evaluate and manage it. • An ability to develop and communicate own ideas and opinions in well-structured arguments.

10. FACULTY RULES

NAS1 – GENERAL RULES

The **General Rules** of the UFS:

UNDERGRADUATE QUALIFICATIONS		POSTGRADUATE DIPLOMAS		BACHELOR HONOURS DEGREES		MASTER'S DEGREES		DOCTORAL DEGREES		HIGHER DOCTORATES	
A1	General Rules	**A20**	General Rules	**A45**	General Rules	**A70**	General Rules	**A100**	General Rules	**A130**	General Rules
A2	Applying for Admission	**A21**	Applying for Admission	**A46**	Applying for Admission	**A71**	Applying for Admission	**A101**	Applying for Admission	**A131**	Applying for admission
A3	Admission or readmission to the UFS and to an academic qualification	**A22**	Admission or readmission to the UFS and to an academic qualification	**A47**	Admission or readmission to the UFS and to a Bachelor Honours Degree	**A72**	Admission or readmission to the UFS and to a Master's Degree	**A102**	Admission or readmission to the UFS and to a Doctoral Degree	**A132**	Admission to the Higher Doctorate Degree
A4	Submission of documentation required to register as a student	**A23**	Submission of documentation required to register as a student	**A48**	Submission of documentation required to register as a student	**A73**	Submission of documentation required to register as a student	**A103**	Submission of documentation required to register as a student		
						A74	Mode of presentation	**A104**	Mode of presentation		
						A75	Requirements in respect of a Master's Degree research dissertation or interrelated, publishable manuscripts/ published articles or a coursework Master's Degree mini-dissertation	**A105**	Requirements in respect of a thesis, interrelated publishable manuscripts/ published articles or a mini-thesis		
A5	Duration of study and compiling a curriculum	**A24**	Duration of study and compiling a curriculum	**A49**	Duration of study and compiling a curriculum	**A76**	Duration of study and compiling a curriculum	**A106**	Duration of study and compiling a curriculum		
A6	Student registration and re-registration	**A25**	Student registration and re-registration	**A50**	Student registration and re-registration	**A77**	Student registration and re-registration	**A107**	Student registration and re-registration	**A133**	Student registration and re-registration
						A78	Registration of research titles and modifying a research title	**A108**	Registration of provisional research titles and modifying a research title		
						A79	Supervisor(s) and co-supervisor(s)	**A109**	Promoter(s) and co-promoter(s)	**A134**	Mentor
						A80	Examiners and moderators	**A110**	Examiners	**A135**	Examiners
A7	Switching qualifications and/or modules and/ or instructional modes and/or migrating to another UFS campus/ centre	**A26**	Switching qualifications and/or disciplines and/or modules and/or migrating to another UFS campus/ centre	**A51**	Switching qualifications and/or disciplines and/ or modules and/or migrating to another UFS campus/centre	**A81**	Switching qualifications and/or disciplines and/or modules and/or migrating to another UFS campus/centre	**A111**	Switching qualifications and/ or disciplines and/or modules and/or migrating to another UFS campus/centre		
A8	Credit accumulation and transfer	**A27**	Credit accumulation and transfer	**A52**	Credit accumulation and transfer	**A82**	Credit accumulation and transfer	**A112**	Credit accumulation and transfer		
										A136	Requirements to be met when submitting scientific publications

UNDERGRADUATE QUALIFICATIONS		POSTGRADUATE DIPLOMAS		BACHELOR HONOURS DEGREES		MASTER'S DEGREES		DOCTORAL DEGREES		HIGHER DOCTORATES	
A9	Assessment rules	**A28**	Assessment rules	**A53**	Assessment rules	**A83**	Assessment rules	**A113**	Assessment rules	**A137**	Assessment reports
A10	Qualification with distinction	**A29**	Qualification with distinction	**A54**	Qualification with distinction	**A84**	Qualification with distinction	**A114**	Qualification with distinction	**A138**	Pass requirements and qualification with distinction
										A139	Plagiarism
A11	Qualification certificates, Dean's medals and Senate medals	**A30**	Qualification certificates	**A55**	Qualification certificates, Dean's medals and Senate medals	**A85**	Qualification certificates, Dean's medals and Senate medals	**A115**	Qualification certificates	**A140**	Qualification certificates
		A31	Intellectual property	**A56**	Intellectual property	**A86**	Intellectual property	**A116**	Intellectual property		
		A32	Publication of a research essay	**A57***9*	Publication of a research report	**A87**	Publication of a Master's Degree research dissertation or a coursework Master's Degree mini-dissertation	**A117**	Publication of a thesis		
12	Results statements, academic records, study records, certified statements, certificates of conduct and certified examination timetables	**A33**	Results statements, academic records, study records, certified statements, certificates of conduct and certified examination timetables	**A58**	Results statements, academic records, study records, certified statements, certificates of conduct and certified examination timetables	**A88**	Results statements, academic records, study records, certified statements, certificates of conduct and certified examination timetables	**A118**	Results statements, academic records, study records, certified statements, and certificates of conduct		
A13	Requests on the basis of exceptional circumstances	**A34**	Requests on the basis of exceptional circumstances	**A59**	Requests on the basis of exceptional circumstances	**A89**	Requests on the basis of exceptional circumstances	**A119**	Requests on the basis of exceptional circumstances		
A14	Discipline	**A35**	Discipline	**A60**	Discipline	**A90**	Discipline	**A120**	Discipline		
A15	Financial support	**A36**	Financial support	**A61**	Financial support	**A91**	Financial support	**A121**	Financial support		
A16	Module and venue timetable and examination timetable	**A37**	Module and venue timetable and examination timetable	**A62**	Module and venue timetable and examination timetable	**A92**	Module and venue timetable and examination timetable				
A17	Residence in campus accommodation	**A38**	Residence in campus accommodation	**A63**	Residence in campus accommodation	**A93**	Residence in campus accommodation	**A122**	Residence in campus accommodation		
A18	Fees payable	**A39**	Fees payable	**A64**	Fees payable	**A94**	Fees payable	**A123**	Fees payable	**A141**	Fees payable
A19	Information communication and information technology	**A40**	Information communication and information technology	**A65**	Information communication and information technology	**A95**	Information communication and information technology	**A124**	Information communication and information technology		
		A41 to A44	For potential further additions	**A66 to A69**	For potential further additions	**A96 to A99**	For potential further additions	**A125 to A129**	For potential further additions	**A142 to A144**	For potential further additions

The General Rules of the UFS apply to this Faculty *mutatis mutandis* (A1 to A147). These **Rules of the UFS** are, with the necessary adjustments, applicable to all the qualifications that are awarded by the Faculty of Natural and Agricultural Sciences. Rules of the **Faculty of Natural and Agricultural Sciences (NAS),** which specifically apply to the degree and other programmes presented in the Faculty, are equally important and relevant.

Students must consult the new Rule Book of the Faculty **every academic year before registration** to ensure alignment with updated curricula, as the Faculty updates the Rule Book to keep abreast of the latest scientific developments. It is the student's **responsibility** to be conversant with these rules. The following rules are important.

NAS2 AND NAS3 – ENTRANCE AND PROGRESS REQUIREMENTS

UNDERGRADUATE PROGRAMMES

The Faculty offers various undergraduate qualifications in different categories including Advanced Diplomas, University Access Programmes, Access and Extended Curriculum Programmes, Bachelor's Degrees and Professional Bachelor's Degrees.

Bloemfontein Campus

Diplomas:

- Advanced Diploma in Sustainable Agriculture and Rural Development

University Preparation-, Access- and Extended Curriculum Programmes:

- University Access Programme: Agricultural Sciences for BAgric
- University Access Programme: Natural and Agricultural Sciences (Mathematics and Chemistry) for BSc
- Bachelor of Agriculture Extended Curriculum Programme
- Bachelor of Agricultural Sciences; Extended Curriculum Programme
- Bachelor of Science Extended Curriculum Programme (Mathematics and Chemistry)
- Bachelor of Science Extended Curriculum Programme (Mathematics and Finances)

Bachelor's Degrees:

Bachelor of:

- Architecture
- Agriculture majoring in:
  Agricultural Economics, Agricultural Extension, Agricultural Management, Animal Production, Production Management, Crop Production Management, Irrigation Management, Mixed Farming Management, Wildlife Management, Agricultural Economics;
- Computer Information Systems;
- Consumer Sciences.

Bachelor of Science majoring in:

- Actuarial Science
- Agricultural Economics
- Biological Sciences:
  Behavioural Genetics, Biochemistry and Botany, Biochemistry and Entomology, , Biochemistry and Genetics, Biochemistry and Microbiology, Biochemistry and Physiology, Biochemistry and Statistics, Biochemistry and Zoology, Botany and Entomology, Botany and Genetics, Botany and Microbiology, Botany and Plant Breeding, Botany and Plant Pathology, Botany and Zoology, Entomology and Genetics, Entomology and Microbiology, Entomology and Zoology, Forensic Sciences, Genetics and Microbiology, Genetics and Physiology, Genetics and Zoology, Microbiology and Statistics, Microbiology and Zoology, Plant Health Ecology.
- Chemical and Physical Science:
  Chemistry and Biochemistry, Chemistry and Botany, Chemistry and Microbiology, Chemistry and Physics, Physics and Agrometeorology, Physics and Astrophysics, Physics and Engineering Subjects.
- Geosciences:
  Geo-Informatics, Geography and Agrometeorology, Geography and Environmental Sciences, Geography and Statistics, Environmental Geology, Geochemistry, Geology and Chemistry, Geology and Geography, Geology and Physics, Geology Specialisation.
- Mathematical Sciences:
  Mathematical Statistics and Statistical Sciences: Climate Science, Econometrics, Investment Sciences, Psychometrics, Statistics and Accounting, Statistics and Economics, Statistics and Psychology; Mathematics: Mathematics and Applied Mathematics, Mathematics and Chemistry, Mathematics and Mathematical Statistics, Mathematics and Physics.

Bachelor of Science in Building Economic Management (Residential)

Bachelor of Science in Construction Management (Compact Learning)

Bachelor of Science in Quantity Surveying (Compact Learning)

Bachelor of Science in Information Technology majoring in:

Computer Science and Business Management, Computer Science and Chemistry, Data Science, Computer Science and Mathematics, Computer Science and Physics.

Professional Bachelor's Degrees:
Bachelor of Science in Agriculture majoring in:

Agrometeorology, Agronomy, Animal Sciences, Grassland Sciences, Plant Breeding, Plant Pathology, Soil Sciences, Wildlife Production.

Qwaqwa campus

Access and Extended Curriculum Programmes:

- University Access Programme: Natural and Agricultural Sciences (Mathematics and Chemistry) for
- BSc, Access: Natural and Agricultural Sciences (Mathematics and Chemistry) for BSc,
- Bachelor of Science Extended Curriculum Programme (Mathematics, Chemistry and Biology),
- Bachelor of Science Extended Curriculum Programme (Mathematics, Geography and Biology)
- Bachelor of Science Extended Curriculum Programme (Mathematics and Computer Science).

Bachelor's Degrees:
Bachelor of Science majoring in:

- Biological Sciences:
  Botany, Zoology, Life Sciences
- Chemical and Physical Sciences:
  Chemistry and Botany, Chemistry and Physics
- Geosciences:
  Environmental Geography, Geography and Life Sciences, Geography and Tourism
- Information Technology:
  Bachelor of Science in Information Technology majoring in: Computer Science and Chemistry, Computer Science and Management, Computer Science and Physics
- Mathematical Sciences:
  Mathematics and Computer Science, Mathematics and Chemistry, Mathematics and Physics.

NAS2.1 – Admission requirements

In addition to the requirements contained in GENERAL RULES, a student has to comply with these additional Faculty requirements:

a) Students should apply for admission to the programmes listed above on the prescribed form before the closing date.
b) The following Bachelor's and Bachelor of Science Degrees require selection: Architecture, Construction Management, Forensic Sciences, Geology, Physics and Engineering Sciences and Quantity Surveying.
c) Applications to these programmes, on the prescribed form, must reach Director: Student Academic Services on or before 31 July the year before intended registration for Architecture, Quantity Surveying and Construction Management, or 30 September for the rest, the year before the intended registration. Students will be notified of preliminarily selection before the end of November, but the final selection will only be confirmed after the National Senior Certificate (NSC) or National Certificate (Vocational) (NCV) examination results are available.
d) Admission depends on Admission Point (AP) or the M Scores (MS) as well as the performance in Mathematics (M), Physical Science (PS) and Life Sciences (LS). The AP or the MS are calculated as indicated in Table 3:
e) The admission requirements in Table 4 below are a broad indication for entrance to the Faculty of Natural and Agricultural Sciences and applicable to prospective students. It is important to note that some programmes have higher requirements or the requirements are adjusted as indicated in NAS 2.2.

Table 3: Values to be used for all individual or all individual NSC or NCV subjects completed to calculate AP and M Scores

Calculation of the AP with regard to students who passed Grade 12 in 2008 onwards:

NSC or NCV Performance level for subjects	UFS Admission Point (AP)	NSC or NCV Performance level for subjects	UFS Admission Point (AP)
7 (90% – 100%)	8	4 (50% - 59%)	4
7 (80% – 89%)	7	3 (40% – 49%)	3
6 (70% – 79%)	6	2 (30% – 39%)	2
5 (60% – 69%)	5		

If the performance level in Life Orientation is 5 or above, it contributes 1 to the AP Score. If students include more than the required 7 subjects, select the best 6 to calculate the AP Score.

Calculation of the M Score with regard to students who passed Grade 12 prior to 2008:

M Scores are calculated using the symbols of the six (6) best matriculation subjects (regardless of whether they are higher or standard grade) passed in one examination.

Symbol	A	B	C	D	E	F
HG	8	7	6	5	4	3
SG	6	5	4	3	2	1

Table 4: Broad Admission requirements (These requirements must be read with Table NAS2.2)

The following is applicable to students who matriculated before or during 2007:	The following is applicable to students who completed the National Senior Certificate during or after 2008:
(i) Senior certificate with matriculation endorsement (matriculation exemption) or an equivalent qualification. (ii) A minimum MS of 32. (iii) HG = E or SG = C in an official tuition language. (iv) Mathematics HG = D or SG = B. Alternatively at least a pass mark of 60% in MATD1564 or MATD1534 or MATM1584. If STSM1614 is included in the learning programme at least a level 6 (70%) required for Mathematics. (v) Both Biology and Physical Science will be required. **Take note that not all BSc programmes require both Life and Physical Sciences. See NAS 2.2 for more detail.** (vi) Biology HG = D or SG = B and Physical Science HG = E or SG = C. (vii) Participation in the National Benchmark (NBT) tests for Language. (viii) Participation in the National Benchmark (NBT) tests for Mathematics.	(i) NSC or NCV with an endorsement that allows entrance to degree studies or an equivalent qualification. (ii) A minimum AP of 32, as calculated from Table 3 (iii) A performance level 4 (50%) in an official tuition language. (iv) Mathematics on level 5 (60%). Alternatively, at least a pass mark in MATD1564 or MATD1534 or MATM1584 is required. If STSM1614 is included in the learning programme a level 6 (70%) required for Mathematics. Alternatively, a pass mark of at least 80% in MATD1564 or at least 70% in MATM1584 or a pass in MATM1534 is required. (v) Both Life Science and Physical Science must be included. Take note that not all BSc programmes require both Life and Physical Sciences. See NAS 2.2 for more detail. (vi) Life Sciences level 5 (60%) and Physical Science level 5 (60%). Alternatively, at least 60% is required in the modules CHEM1552, CHEM1532, CHEM1622 and CHEM1642. (vii) Participation in the National Benchmark (NBT) tests for Language. (viii) Participation in the National Benchmark (NBT) tests for Mathematics.

f) If students wish to transfer from other higher education institutions or another UFS Faculty's programme before they have completed their undergraduate studies they must provide evidence of their academic progress, in the form of an academic record and module content description. These records will be used to determine which modules could be recognised in the UFS prescribed curriculum and at which level the student will be placed if admission granted by the Faculty of Natural and Agricultural Sciences.

g) Students attending and passing the mathematics short courses can upgrade their mathematics marks to enable them to meet the mathematics requirements. MATD1400 to upgrade mathematical literacy, MATD1554 to upgrade mathematics level 2 and 3 and MATD1564 to upgrade mathematics level 4.

h) Students registered for selection courses may also register for NAS111 (8 credits) and for CIE122 (8 credits) in the place of UFS101/UFSS1504(16 credits).

NAS2.2 – Specific undergraduate programme requirements

Specific admission requirements:

(a) Advanced Diploma in Sustainable Agriculture and Rural Development
- A related Diploma or qualification at NQF Level 6.
- Applicants with different qualifications can be admitted if their qualifications are judged equivalent by a designated UFS panel through the Recognition of Prior Learning process. Applicants should have sound and proven experience relevant to the agricultural environment. Practical experience in agriculture and/or rural development, and appropriate prior learning are prerequisites for admission.
- This qualification is not envisaged for the individual passing directly on from the National Senior Certificate to subsequent NQF Exit Levels.

(b) BAgric extended four-year
- Requirement (i) in Table 4.
- A minimum AP of 22.
- Official tuition language with a minimum achievement level 4 (50%).
- Mathematics on performance level 2 (30%) or Mathematical Literacy at least at level 5 (60%) if the AP score is above 26.

(c) BSc extended four-year (Chemistry and Mathematics) (Chemistry, Mathematics and Biology), (Geography, Mathematics and Biology) (Qwaqwa only)
- Requirement (i) in table 4.
- A minimum AP of 22.
- Official tuition language with a minimum achievement level 4 (50%).
- Mathematics on performance level 3 (40%).
- Life Sciences at performance level 3 (40%) or Physical Science on performance level 3 (40%).

(d) (i) BSc extended four-year (Mathematics and Finances)
- Students from this programme can only transfer to BScQS or CM or BScMathemtical Sciences if they are selected.
- Requirement (i) in table 4.
- A minimum AP of 22.
- Official tuition language with a minimum achievement level 4 (50%).
- Mathematics at performance level 3 (40%).

(ii) BSc extended four-year (Computer Science and Mathematics) (Qwaqwa only)
- Requirement (i) in table 4.
- A minimum AP of 22.
- Official tuition language with a minimum achievement level 4 (50%).
- Mathematics at performance level 3 (40%).
- If students want to major in Physics or Chemistry together with Computer Science they need to Physical Science at performance level 3 (50%)

(e) BSc (Agriculture) extended five-year
- Requirement (i) in table 4.
- A minimum AP of 24 and a performance level 4 (50%) in an official tuition language.
- Mathematics at performance level 3 (40%).
- Life Sciences or Agricultural Science at performance level 3 (40%) or Physical Science at performance level 3 (40%).

(f) BAgric (Management)
- Requirements (i), (iii) and (vi) in table 4.
- Mathematics at performance level 3 (40%) with TP of 30 or Mathematical Literacy at least at level 7 (80%) if the AP is 31 or above.
- BAgric(Agricultural Economics).
- Requirements (i)-(iii) & (vii) in table 4.
- Mathematics at performance level 4 (50%).

(g) BSc majoring in Actuarial Science
- Requirements (i), (iii)-(iv), (vii) & (viii) in table 4.
- A minimum AP of 34.
- Mathematics at performance level 6 (70%).
- If students transfer from foundational programmes or other degree programmes they must have an average of at least 70%, and at least 65% for each individual module.

(h) BSc (Agriculture)
- Requirements (i)-(iv), (vii) & (viii) in table 4.
- Two of the following three subjects: Life Sciences or Agricultural Sciences or Physical Science.
- Performance level 5 (60%) for Life Sciences or Agricultural Sciences and Performance level 5 (60%) for Physical Science.

(i) BSc majoring in Agricultural Economics
- Requirements (i)-(iv), (vii) & (viii) in table 4.

(j) BConSc (Consumer Sciences)
- Requirements (i)-(iii) & (vii) in table 4. Mathematics at performance level 2 (at least 30%) or Mathematical Literacy at least at level 5 (80%)

(k) BArch
- A selection process takes place before admission. Applications and completed selection forms must reach the UFS before the 31 July the year before intended registration.
- A maximum number of 45 students are admitted.
- A student registered for a programme at the UFS and wishing to change to the BArch-programme, must apply online and submit completed selection forms to the department on or before 31 July the year before intended registration.
- Requirements (i)-(iii), (vii) & (viii) in table 4.
- Mathematics at performance level 4 (50%).
- All information pertaining to the selection process is available on the departmental website: www.ufs.ac.za/architecture; see 'Academic Information'.
- Students will be notified of the outcome not later than the end of November of the year before intended registration.

(l) BSc majoring in Biological Sciences with:
- Biochemistry and Microbiology
- Students wishing to continue with MCBP2616 must take note that a maximum of 160 students will be accepted due to laboratory constraints. Students will be admitted based on academic performance.
- Students wishing to continue with BOCB2616 must take note that a maximum of 210 students will be accepted due to laboratory and equipment constraints. Students will be admitted based on academic performance.
- Genetics
- Please note a selection process is required for: GENE2616, GENE2626, GENE3714, GENE3724, GENE3734, GENE3744. Only 150 students will be accepted based on academic performance. Students wishing to continue with any of these modules must apply for selection (genetics@ufs.ac.za).

(m) BSc majoring in Chemical and Physical Science
- Requirements (i)-(iv), (vii) & (viii) in table 4.
- Physical Science at performance level 5 (60%) or Physical Science HG = E or SG = C.
- If Biological modules is the second major Life Sciences at performance level 5 (60%) is required.
- Please note a selection process is required for: CHEM26XX and CHEM37XX. Only 80 second year students and

a maximum of 60 third year students (Bloemfontein campus) and 70 second year students and a maximum of 45 third year students for the Qwaqwa campus will be admitted owing to laboratory constraints. These students will be admitted based on academic performance. Students intending to continue with second year Chemistry should also take note that CHEM1643 do not offer that possibility.
- Students intending to register for engineering modules must take note that limited space is available.
- BSc majoring in Physics and Engineering Subjects:
  AP score of ≥30, Mathematics level 6 (70%) and Physical Science 5 (60%).

(n) BSc majoring in Forensic Sciences
- A selection process takes place before admission. A maximum number of 80 students will be admitted. NBT tests results will also be used for selection purposes.
- Applications close on 30 September the year before intended registration.
- Requirements (i), (iii)-(iv), (vii) & (viii) in table 4.
- A minimum AP ≥ 34 (with cumulative AP ≥ 17 for Mathematics, Life Science and Physical Science.
- No person with a criminal record will be allowed into this programme.

(o) BSc majoring in Geography
- Requirements (i)-(iv) and (vii) & (viii) in Table 4 above.
- Physical Science at performance level 5 (60%) to register for the Geo-Informatics programme.
- Life Sciences at performance level 5 (60%) is required for Environmental Sciences.
- Life Science performance level 5 (60%) or Physical Science performance level 5 (60%) for the Statistics and Agrometeorology programmes.

(p) BSc majoring in Geology
- A selection process takes place before admission. In the first year a maximum number of 80 students will be admitted to GLGY1614 owing to laboratory constraints. In the second and third year a maximum number of 60 students will be admitted due to laboratory constraints. These students will be admitted based on academic performance.
- Students who have not obtained an average of at least 55% for GLGY1614 + GLGY1624 or failing GLGY1614 or GLGY1624 or any other prescribed first year module will not be able to continue their studies in any of the Geology programmes.
- Applications to the BSc Geology programme, on the prescribed form, must reach the Registrar, Academic Student Services, UFS, Bloemfontein, on or before 30 September of the year before the intended registration. Students will be notified of the outcome as soon as examination results are available and no later than January.
- The selection process will be based on academic performance.
- Requirements (i)-(iv), (vii) & (viii) in table 4.
- Physical Science and Mathematics at performance level 5 (60%) or Physical Science HG = E or SG = C. Alternatively, at least 65% is required in the modules CHEM1552, CHEM1532, CHEM1622 and CHEM1642, and in MATD1564/MATD1534.
- An AP of 30 or higher, an AP of 32 is highly recommended.
- No occasional study students will be allowed.

(q) BCIS
- Requirements (i)-(iii) and (vii) & (viii) in table 4.
- Mathematics at performance level 4 (50%).

(r) BSc (IT)
Bloemfontein
- Requirements (i)-(iii) and (vii) & (viii) in table 4.
- For BSc(IT) majoring in Data Science: Mathematics at performance level 6 (70%) and Physical Science at performance level 5 (60%).
- For BSc(IT) majoring in Computer Science and Mathematics: Mathematics at performance level 6 (70%) and Physical Science at performance level 5 (60%).
- For BSc(IT) majoring in Computer Science and Chemistry: Mathematics at performance level 5 (60%) and Physical Science at performance level 5 (60%).
- For BSc(IT) majoring in Computer Science and Physics: Mathematics at performance level 5 (60%) and Physical Science at performance level 5 (60%).
- For BSc(IT) majoring in Computer Science and Business Management: Mathematics at performance level 4 (50%) and Physical Science at performance level 4 (50%).

BSc (IT)
Qwaqwa
- Requirements (i)-(iii) and (vii) & (viii) in table 4.
- For BSc(IT) majoring in Computer Science and Chemistry: Mathematics at performance level 5 (60%) and Physical Science at performance level 5 (60%).
- For BSc(IT) majoring in Computer Science and Physics: Mathematics at performance level 5 (60%) and Physical Science at performance level 5 (60%).
- For BSc(IT) majoring in Computer Science and Management: Mathematics at performance level 4 (50%) and Physical Science at performance level 4 (50%).

(s) BSc majoring in Mathematical Sciences
- Requirements (i)-(iv), (vii) & (viii) in table 4.
- Mathematics at performance level 6 (70%). Alternatively, (senior students) a mark of at least 80% in MATD1564/ MATD1534 or at least 70% in MATM1584.
- If Agrometeorology or Chemistry or Physics is the second major Physical Science with a performance level of 5 (60%) is required.
- If enrolling for Applied Statistics degrees only level 5(60%) for Mathematics is required.

(t) BSc Construction Economics and Management
- Admission to the BSc (Construction Economics and Management) is subject to the General Rules for First Qualifications, Postgraduate Diplomas, Honours Bachelor's Degrees, Master's Degrees, Doctoral Degrees, Higher Doctoral Degrees, Honorary Degrees and Convocation, as well as the rules of the Faculty of Natural and Agricultural Sciences.
- In addition, applicants must:
  - Be in possession of a National Senior Certificate with appropriate subject combinations and levels of achievement that has been certified with an applicable endorsement by Umalusi; or
  - Be in possession of a National Certificate (Vocational) with appropriate subject combinations and levels of achievement; and
  - Other than in extraordinary circumstances, take the National Benchmark Test(s); and
- Attain the minimum M-score of 32 for the SC or admission point (AP) of 33 in the NSC; and
- Have an achievement level of no less than 4 (50%) for the school-leaving examination in English; and
- An achievement level 5 (60%) for Mathematics in the NSC.
- Either one of the following subjects at achievement level 4 in the NSC is required: Economics; Business Studies; Accounting; Physical Science.
- Alternatively, a Higher Certificate or an Advanced Certificate or Diploma in a cognate field may satisfy the minimum admission requirements.

(u) BSc majoring in Quantity Surveying and BSc majoring in Construction Economics and Management
- NSC or NCV with an endorsement that allows entrance to degree studies or an equivalent qualification.
- A minimum AP of 3 2.
- A performance level 4 (50%) in an official tuition language.
- Mathematics on level 5 (60%).
- One of Economics, Business Studies, Accounting or Physical Science on level 4 (50%) is recommended.
- A maximum of 10 students of the extended programme who passed Mathematics development modules and
- mainstream modules of at least 70% average.
- A maximum number 80 students are selected.
- Application must be submitted before or on 31 July, the year before intended registration to the programme.
- Students must be 23 years or older and must be fulltime employed in the construction sector.

NAS2.3 – Other requirements:

Note to students applying for any programme in this faculty

a) Students who score in the language NBT test, lower than the institutional set requirement (set norm), must register for the language module EALN1508 or AGAN1508.
b) First-time entering students with a performance level 5 in Mathematics or with a NBT mathematics score lower than 50% will have to attend compulsory extra Mathematics tutorial classes for three hours per week.
c) First-time entering students with a performance level of 4 for Physical Science will have to attend compulsory tutorials in Chemistry and Physics if those modules are included in their curriculum.
d) Registration for extra modules has financial implications, and the extra modules do not contribute to the total number of credits required to obtain a degree.
e) Students who have registered for the extra language module and more than one additional tutorial will not be able to register for the full curriculum and will only be allowed to register for three required modules per semester as prescribed in the learning programme.

Postgraduate programmes

The Faculty offers various postgraduate qualifications including Postgraduate Diplomas, Bachelor Honours, Master's, and Doctoral Degrees.

Bloemfontein Campus

Postgraduate Diploma in:
- Disaster Management,
- Integrated Water Management,
- Sustainable Agriculture.

Bachelor Honours in:
- Architecture
- Agriculture majoring in:
  Agricultural Management, Animal Production, Irrigation Management, Wildlife Management
- Spatial Planning, Spatial Planning (specialising in Human Settlements)
- Computer Information Systems

Bachelor of Science Honours in Agriculture majoring in:
Agrometeorology, Agronomy, Animal Sciences, Grassland Science, Plant Breeding, Plant Pathology, Soil Science, Wildlife.

Bachelor of Science Honours majoring in:
Actuarial Science, Agricultural Economics, Agrometeorology, Applied Statistics, Astrophysics, Behavioural Genetics, Biochemistry, Botany, Chemistry, Computer Science and Informatics, Data Science, Entomology, Environmental Geology, Food Science, Forensic Genetics, Genetics, Geochemistry, Geography, Geography

and Environmental Science, Geohydrology, Geoinformatics, Geology, Limnology, Mathematics and Applied Mathematics, Mathematical Statistics, Microbiology, Physics, Plant Breeding, Plant Health Ecology, Plant Pathology, Soil Science, Zoology.

Bachelor of Science Honours in Consumer Science
Bachelor of Science Honours in Construction Management
Bachelor of Science Honours in Quantity Surveying

Master's Degrees majoring in:

Animal Production, Agricultural Management, Architecture (Research) , Architecture (Professional), Architecture (Design), Disaster Management, Environmental Management, Human Settlements, Irrigation Management, Land and Property Development Management, Sustainable Agriculture, Urban and Regional Planning, Urban and Regional Planning (Professional), Wildlife Management.

Master of Science majoring in:

Actuarial Science, Agricultural Economics, Agrometeorology, Applied Mathematics, Applied Statistics, Astrophysics, Behavioural Genetics, Biochemistry, Botany, Chemistry, Computer Information Systems, Computer Science and Informatics, Conservation Biology, Construction Management, Consumer Science, Data Science, Entomology, Environmental Geology, Environmental Management, Environment Sciences, Food Science, Forensic Genetics, Forensic Sciences, Forensic Sciences Interdisciplinary, Genetics, Geochemistry, Geography, Geography and Environmental Science, Geohydrology, Geo-Informatics, Geology, Grassland Science, Integrated Water Management, Limnology, Mathematics, Mathematical Statistics, Microbial Biotechnology, Microbiology, Mineral Resource Management, Nano Science, Physics, Plant Breeding, Plant Breeding Interdisciplinary, Plant Health Ecology, Plant Pathology, Plant Pathology Interdisciplinary, Polymer Science, Property Science, Quantity Surveying, Risk Analysis, Soil Science, Zoology.

Master of Science majoring in:

SPECIALISING IN CLIMATE CHANGE

Master of Science in Agriculture majoring in:

Agrometeorology, Agrometeorology Interdisciplinary, Agronomy, Agronomy Interdisciplinary, Animal Sciences, Food Science, Grassland Science, Plant Breeding, Plant Breeding Interdisciplinary, Plant Pathology, Plant Pathology Interdisciplinary, Soil Science, Soil Science Interdisciplinary, Wildlife.

Doctoral Degrees majoring in:

Actuarial Science, Animal Production, Architecture, Architecture with Design, Agricultural Economics, Agricultural Management, Agrometeorology, Agrometeorology Interdisciplinary, Agronomy, Agronomy Interdisciplinary, Animal Production, Animal Sciences, Astrophysics, Applied Mathematics, Applied Statistics, Behavioural Genetics, Biochemistry, Botany, Chemistry, Computer Information Systems, Computer Science and Informatics, Conservation Biology, Construction Management, Consumer Science, Data Science, Disaster Management, Environmental Management, Entomology, Environmental Geology, Food Science, Forensic Genetics, Forensic Sciences, Forensic Science, Interdisciplinary, Forensic Sciences, Genetics, Geochemistry, Geo-Informatics, Geography, Geography and Environmental Science, Geohydrology, Geology, Grassland Science, Human Settlements, Irrigation Management, Land and Property Development Management, Limnology, Mathematics, Mathematical Statistics, Microbiology, Microbial Biotechnology, MineralResource Management, Nanoscience, Physics, Plant Breeding, Plant Breeding Interdisciplinary, Plant Health Ecology, Plant Pathology, Plant Pathology Interdisciplinary, Polymer Science, Property Science, Quantity Surveying, Risk Analysis, Soil Science, Soil Science Interdisciplinary, Statistics, Sustainable Agriculture, Urban and Regional Planning, Wildlife, Wildlife Management, Zoology.

Doctor of Science Degrees majoring in:

Actuarial Science, Agricultural Economics, Agrometeorology and Agrometeorology Interdisciplinary, Agronomy and Agronomy Interdisciplinary, Animal Sciences, Astrophysics, Applied Mathematics, Behavioural Genetics, Biochemistry, Botany, Chemistry, Computer Information Systems, Computer Science and Informatics, Construction Management, Consumer Science, Environmental Management, Entomology, Environmental Geology, Food Science, Forensic Genetics, Forensic Sciences, Forensic Sciences Interdisciplinary, Forensic Sciences, Genetics, Geochemistry, Geographical Information Systems Geography, Geography and Environmental Science, Geohydrology, Geology, Grassland Science, Limnology, Mathematics, Mathematical Statistics, Microbiology, Microbial Biotechnology, Mineral Resource Management, Nanoscience, Physics, Plant Breeding, Plant Breeding Interdisciplinary, Plant Health Ecology, Plant Pathology, Plant Pathology Interdisciplinary, Polymer Science, Quantity Surveying, Risk Analysis, Soil Science, Soil Science Interdisciplinary, Applied Statistics, Wildlife, Zoology.

Qwaqwa campus

Bachelor of Science Honours degree majoring in:
Botany, Computer Science and Informatics, Environmental Geography, Physics, Polymer Science, Zoology.

Master of Science majoring in:
Botany, Chemistry, Computer Science and Informatics, Environmental Geography, Geography, Mathematics, Physics, Polymer Science, Zoology.

Doctoral Degrees majoring in:
Botany, Chemistry, Computer Science and Informatics, Environmental Geography, Geography, Mathematics, Physics, Polymer Science, Zoology.

NAS3.1 Admission requirements for the Postgraduate Diploma

In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements:

(a) An applicant must have at least a minimum three-year qualification (at NQF Exit Level 7) from any applicable field of study.
(b) A minimum average of 60% must be obtained in the final year of study.
(c) The student must prove to the Academic Departmental Head that he/she has adequate knowledge to justify admission to the programme.
(d) Applicants who do not have the formal minimum requirements to be admitted, must apply through Recognition of Prior Learning.

1.	**Postgraduate Diploma in Disaster Management**	• An appropriate NQF Exit Level 7 qualification • Admission depends on previously acquired knowledge and experience in the disaster management field, as well as
2.	**Postgraduate Diploma in Integrated Water Management**	• An appropriate NQF 7 qualification • Appropriate work experience will be an added advantage.
3.	**Postgraduate Diploma in Sustainable Agriculture**	• An appropriate NQF 7 qualification • Appropriate work experience will be an added advantage.

NAS3.2 Admission requirements for Bachelor Honours Degrees

In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements:

(a) A Bachelor's Degree or equivalent NQF Exit Level 7 qualification including one of the following: BArch, BAgric, BConsSc, BSc (Information Technology), BSc majoring in Quantity Surveying or Construction Management and the following additional requirements per discipline.
(b) A deserving applicant in possession of a BSc degree with the required major modules may be permitted by the Academic Departmental Head and with the approval of the Dean to receive postgraduate training in Agriculture. Such a student registers for BScHons (Agriculture), during which prescribed honours modules as well as certain additional undergraduate Agriculture modules may be taken in consultation with the departmental chair.
(c) All Honours Degrees are selection courses and admission to these degrees is subject to approval of the departmental chair/Programme Director.
(d) Applicants should apply for admission to the Honours Degrees on the prescribed form. These forms should be completed and handed to the relevant Programme Director at the beginning of the second semester. Selection will take place when results are available. The honours programmes start on a date as determined by the relevant department. All modules in the learning programme must be successfully completed.

NAS3.2.1 – Admission requirements for a Honours Degree

In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements:

(a) A Bachelor's Degree or equivalent NQF Exit Level 7 qualification
(b) Appropriate work experience

4.	**Architecture**	• Application and completed selection forms with portfolio must reach the UFS before 31 July the year before i • A selection process takes place before admission. A maximum of 45 students will be admitted. • All information pertaining to the selection process is available on the departmental website: www.ufs.ac.za/ar • To be eligible for BArchHons selection, a student must have obtained a BArch degree or equivalent qualific collective average mark in his/her final year of 55% for the following modules or their equivalent, CONS3700, of 60% for DESN3700 or its equivalent. Students who do not comply with the above prerequisite must either recommendation of the Academic Departmental Head, in an architect's office for a year in order to be eligible • Students may be required to attend a personal interview, present a portfolio and provide verified academic re enroll for the programme will rest with the selection panel.
5.	**Actuarial Science**	• A student must have a BSc or BCom degree in Actuarial Science, as well as qualify for at least four exemptions of which at least one exemption has to be for A211, A212 or A214.

6. Agricultural Economics	**BScHons (Agricultural Economics)** • Admission to the study is subject to the discretion and approval of the Academic Departmental Head. The following criteria are required: o BSc degree in Agricultural Economics o An average mark of 65% for all undergraduate Agricultural Economics modules over the full period of the BSc degree. • Additional modules /modules may be required before admission to the BScHons study. **BAgricHons (Agricultural Economics)** • Admission to the study is subject to the discretion and approval of the Academic Departmental Head. The following criteria are required: o BAgric degree in Agricultural Economics o An average mark of 65% for all undergraduate Agricultural Economics modules over the full period of the BAgric degree. • Additional modules / may be required before admission to the BAgricHons study.
7. Agriculture	**Agricultural Management** • Admission to the study is subject to the discretion and approval of the Academic Departmental Head. The following criteria are required: o BAgric degree in Agricultural Management o An average mark of 60% for all undergraduate Agricultural Economics and Agricultural Management modules over the full period of the BAgric degree. • Additional modules may be required before admission to the BAgricHons study. **Animal Production Management** • Admission to the study is subject to the discretion and approval of the Academic Departmental Head after evaluation by an Academic Advisory Committee. The following criteria are required: o BAgric degree in Animal Production Management with a minimum average of 60% o A minimum average of 65% for undergraduate Animal Production modules over the full period of the BAgric degree. o Additional module(s) may be required before admission to the BAgricHons study **Wildlife Management** • A minimum of 60% in Agricultural Management and/or Agricultural Economics or equivalent modules at NQF 7 level. Animal Science? **Irrigation Management** • A minimum of 60% in Agricultural Engineering or equivalent at NQF 7 level. • Apart from the above mentioned requirements, the Academic Departmental Head may expect a student to complete certain additional modules.
8. Agrometeorology	• A BSc degree featuring Agrometeorology at third-year (NQF 7) level. An average of 60% in undergraduate Agrometeorology modules.
9. Agronomy	• A BSc degree featuring Agronomy at third-year (NQF 7) level. An average of 60% in undergraduate Agronomy modules.
10. Applied Statistics or Risk Analysis	• Students must have passed MATM1634 + MATM1644 + MATM1622 as well as a minimum average mark of 65% in STSA2616 + STSA2626 + STSA3716 + STSA3726 or 50% in STSM3714 + STSM3734 (STSM3724 or STSM3764) + STSM3744 or equivalent NQF 7 level modules (The MATM requirement is inherent for STSM3714).
11. Behavioural Genetics	• Admission into BScHons majoring in Behavioural Genetics is subject to selection. A minimum of 60% in Genetics at third-year (NQF 7) level or equivalent modules are required.
12. Biochemistry	• At least 64 credits in Biochemistry at third-year (NQF 7) level. An average of 65% in undergraduate Biochemistry modules.
13. Botany	• Students who did not receive their BSc Degree at the University of the Free State, need to have achieved a combined average pass mark of 65% for at least 64 credits in their final year Botany modules. For UFS undergraduate students a minimum of 60% in Botany at third-year (NQF 7) level and in consultation with the Academic Departmental Head. Students maybe required to take additional undergraduate modules.
14. Chemistry	• To be considered for BScHons in Chemistry, a student must have a BSc degree. Other prerequisites include MATM1534, plus MATM1644. An average mark of 60% in CHEM3713+CHEM3711, CHEM3733+CHEM3731, CHEM3723+CHEM3721 and CHEM3743+CHEM3741 or equivalent NQF Exit Level 7 modules. Students must apply for admission to the Head of Department before 30 September. Note also that the programme starts annually on 15 January.
15. Computer Information Systems	• A minimum average of 60% for the relevant computer Information Systems modules at third-year (NQF 7) level. An average mark of at least 60% for at least siz undergraduate Business Management modules, but not less than 55% in each module; of which 64 credits need to be at NQF level 5 and/or NQF level 6 and 32 credits at NQF level 7. In exceptional cases students may be allowed in consultation with the Programme Director or Academic Departmental Head.
16. Computer Science and Informatics	• A minimum average of 60% for the relevant Computer Science modules at third-year (NQF 7) level. In exceptional cases students may be allowed in consultation with the Programme Director or Academic Departmental Head.
17. Consumer Sciences	• Consumer Science or relevant NQF at Level 7 level with at least 60%.

18. Construction Management	• A selection process takes place before admission. A maximum number of 60 students are admitted owing to classroom constraints. • Application must be submitted before or on 31 August, the year before intended registration to the Bachelor Honours programme. • Bachelor's/BSc degree in Construction Management from NQF Exit Level 7 from an accredited institution excluding BTech.
19. Data Science	• A minimum average of 60% for the relevant Computer Science modules at third year (NQF 7) level. Statistical Inference and Probability Theory, Linear Algebra and Data Structures. In exceptional cases students maybe allowed in consultation with the Programme Director or Academic Departmental Head.
20. Entomology	• A minimum of 60% in Entomology at third-year (NQF 7) level and in consultation with the Programme Director.
21. Food Science	• At least 64 credits in Food Science at third-year (NQF 7) level. An average of 65% in undergraduate Food Science modules.
22. Forensic Chemistry	• Admission into BScHons in Forensic Sciences is subject to selection. A minimum of 60% in relevant modules at third-year (NQF 7) level or equivalent modules are required.
23. Forensic Sciences	• Admission into BScHons in Forensic Sciences is subject to selection. A minimum of 60% in relevant modules at third-year (NQF 7) level or equivalent modules are required.
24. Genetics and Forensic Genetics	• Admission into BScHons majoring in Forensic Chemistry is subject to selection. A minimum of 60% in Genetics at third-year (NQF 7) level or equivalent modules are required.
25. Geography, Geoinformatics and Environmental Sciences	• A student must achieve an average pass mark of 60% for all Geography modules (64 credits) at third-year (NQF 7) level to be admitted to the Bachelor Honours Degree. In exceptional cases the department may grant admission by virtue of an oral or written assessment in which the student displays relevant knowledge of the theory and principles of the subject. Depending on a student's academic background, additional modules may be prescribed by the department. Proof of computer literacy is a prerequisite. A student's skills in English will be assessed (Proficient performance in the TALPS Test) and if the required standard is not met, additional modules will be prescribed.
26. Geohydrology	• A BSc, BScAgriculture, BEng degree or BTech(Geology) degree. An average of 60% in the final year of a BSc degree calculated from the major subject, as well as Geology, Chemistry, and Mathematics or Statistics on first-year level is required for admission to the degree. A selection process takes place before admission. A maximum of 38 students can be admitted. Application close 30 September the year before intended registration. Proficient performance in the TALPS Test is required. Repeaters will only be allowed if space is available.
27. Geology, Geochemistry and Environmental Geology	• Students who did not receive their BSc Geology Degree at the University of the Free State, need to have achieved a combined average pass mark of 65% for at least 64 credits in their final year Geology modules. • For admission to the Bachelor Honours Degree in Geology, Geochemistry or Environmental Geology a student must achieve a combined average pass mark of 60% in four Geology modules (64 credits) at third-year (NQF 7) level (two modules in the first semester and two in the second semester, including GLGY3714 and GLGY3724 or equivalent modules). Students must complete all required NQF Exit Level 7 Geology modules in a maximum of two years. Students who have completed their Geology modules in the first attempt will be given preference.
28. Grassland Science	• Grassland Science at third-year (NQF 7) level.
29. Life Sciences	• A person must pass with an average of 60% for all third-year and second-year Life Science modules.
30. Limnology	• A BSc or BScAgriculture degree with at least one of the following as major: Biochemistry, Botany, Chemistry, Entomology, Mathematics, Microbiology, Physics, Soil Science, Zoology. • A mimimum of 60% in relevant modules at third year (NQF 7) level and in consultation with the Academic Departmental Head. • A selection process takes place before admission.
31. Mathematical Statistics	• Students must have a minimum average mark of 60% in STSM3714 + STSM3734 (STSM3724 or STSM3764) + STSM3744 or equivalent NQF 7 level modules (The MATM requirement is inherent for STSM3714).
32. Mathematics and Applied Mathematics	• At least four Mathematics and Applied Mathematics or equivalent modules, at third-year (NQF 7) level, completed with an average mark of 60%. In addition, all applicants will have to write and pass an admission examination to verify sufficient background and foundational mathematics knowledge. If necessary, students may be required to take additional undergraduate modules as supplementary prerequisites for certain Bachelor Honours modules. Proficient performance in the TALPS Test is also required before enrolment. The Academic Departmental Head grants admission and consults on the compilation of the curriculum. Students will do an oral presentation for their final selection.
33. Microbiology	• At least 64 credits in Microbiology at third-year (NQF 7) level. An average of 65% in undergraduate Microbiology modules.

34. Physics	• An average mark of 60% in PHYS3714, PHYS3732, PHYS3752, PHYS3724, PHYS3742 and PHYS3762. For a Bachelor Honours Degree in Astrophysics the same prerequisites apply as for the Bachelor Honours Degree in Physics, with the additional stipulation that students should have attained an average mark of 60% for PHYA3772, PHYA3782 and PHYA3709 as well. The Academic Departmental Head may grant permission for admission to the Bachelor Honours Degree in exceptional cases. The programme commences in middle January and students must apply for admission to the Academic Departmental Head before that date.
35. Plant Breeding	• A minimum of 60% average for all the Plant Breeding modules on third-year (NQF 7) level is required for Plant Breeding Honors or related subject field of equivalent NQF7 modules and in consultation with the Academic Departmental Head. Students may be required to take additional undergraduate courses based on their academic background. Students completing the bridging course must have a 65% average for all plant breeding modules required for bridging.
36. Plant Health Ecology	• Plant Health or equivalent modules at third-year (NQF 7) level.
37. Plant Pathology	• An average of 60% for the third-year in a BSc or BScAgriculture Degree with the following as major: Plant Pathology or equivalent NQF Level 7 modules. Students may be required to take additional undergraduate courses based on their academic background.
38. Polymer Science	• A minimum of 60% average for all the Chemistry modules on third-year (NQF 7) level is required.
39. Soil Science	• A BSc degree featuring Soil Science at third-year (NQF 7) level. An average of 60% in undergraduate Soil Science modules.
40. Spatial Planning and BSPHons (specialising in Human Settlements)	• Closing date for applications is 30 September prior to intended year of registration. • An appropriate qualification at NQF Level 7 (SAQA certificate must accompany the qualification when requested), as approved by the academic programme director and an average of at least 60% in previous qualifications. • Applicants MUST write selection tests if they are considered suitable for selection. These tests will be conducted online at a pre-arranged time and date. • If a student does not entirely meet the admission requirements, the academic programme director and the Recognition of Prior Learning office, in consultation with the dean may, in meritorious cases, recommend that some concessions be made in respect of the requirements. The final decision shall rest with the dean. Supplementary courses, as determined by the head of the department, may be required, and these supplementary courses must be passed in order to complete the degree.
41. Statistics	• MATM1534, MATM1644 and MATM1622 or MATM1614 and MATM1624 as well as a minimum average mark of 65% in STSA2616, STSA2626, STSA3716 and STSA3726. • The head of department in consultation with the Dean may exempt students from taking certain courses if they have completed a similar course in a different degree at the same NOF level.
42. Quantity Surveying	• A selection process takes place before admission. A maximum number of 60 students are admitted owing to classroom constraints. • Application must be submitted before or on 31 August, the year before intended registration to the Bachelor Honours programme. • Bachelor's/BSc degree in Quantity Surveying on NQF Exit Level 7 from an accredited institution excluding BTech.
43. Wildlife	• Grassland Science at third-year (NQF 7) level or equivalent modules and in consultation with the Academic Departmental Head.
44. Zoology	• A minimum of 60% in Zoology at third-year (NQF 7) level and in consultation with the Programme Director.

NAS3.3 – Admission requirements for Master's Degrees

In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements:

(a) All Master's Degrees are selection programmes and admission to these degrees is subject to approval of the Academic Departmental Head.

(b) Applicants must apply for admission to the Master's Degree. Selection will take place in the second semester. After that results will be communicated. The Master's programmes start on a date as determined by the relevant department. Each module in the learning programmes must be successfully completed.

(c) Applicants must have an applicable Bachelor Honours Degree or equivalent NQF Exit Level 8 qualification and the additional requirements per discipline (see Reg. NAS3.5).

(d) If a student does not meet the admission requirements, the Dean, in exceptional circumstances, may, after consultation with the Academic Departmental Head, recommend to the Registrar (in the Registrar's sole discretion) that the granting of a concession with regard to the admission requirements be considered.

(e) Bachelor of Science Honours or relevant Honours Degree on NQF Exit Level 8 with an average of 60% in the exit year of the relevant degree may be recognized as meeting the minimum entry requirements for a Master's Degree programme.

NAS3.4 – Specific programme requirements for Master's Degrees

1.	**Master of Architecture** *(for Professional registration)*	• Application must reach the UFS before 31 July the year before intended registration. • A selection process takes place before admission. A maximum number of 45 students will be admitted. • All information pertaining to the selection process is available on the departmental website: www.ufs.ac.za/architecture; see 'Academic Information'. • To be eligible for MArch selection a student must have obtained a BArchHons degree or equivalent qualification from any other Architectural learning site with a joint average mark in his/her final year of 55% for the following modules or their equivalent: CONS6808, HURB6804 and RARC6808, as well as a subminimum of 60% for DESN6800 or its equivalent. • Students who do not comply with the above prerequisite must either repeat (only once) selected module(s) or work,on the recommendation of the Academic Departmental Head, in an architect's office for a year in order to be eligible for MArch selection the following year. • Students may be required to attend an interview, present a portfolio and provide verified academic records. • Qualifying students must submit a research proposal as part of the selection process. • The final discretion whether the student is regarded as ready for the programme will rest with the selection panel.
2.	**Master of Architecture** *(Research) (Research specialising in Design)*	• Apart from the General Rules the following is applicable: • Students must have obtained either the postgraduate professional qualification, BArch or an equivalent thereof OR the BArchHons or its equivalent. • Students who are in possession of the BArchHons must prove that a Design Dissertation formed part of the requirements for the conferment of such degree. • Students who are in possession of the BArchHons must have obtained a minimum of 60% in THREE of the following modules or their equivalent: DESN6800, CONS6808, HURB6804 and RARC6808. • Qualifying students must submit a dissertation proposal as determined and communicated by the Academic Departmental Head. The final discretion whether the student can enrol for the programme will be the selection panel's.

3.	**Master of Agriculture**	Apart from the General Rules, the following apply: • Students must convince the specific Academic Departmental Head that he/she has sufficient knowledge of the subject to be admitted to the programme. **MAgric (Agricultural Management)** • Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a postgraduate selection committee. The following criteria are required: • Bachelor Honours majoring in Agricultural Management • Proof of successful completion of: o AGMA6800 OR o equivalent module for the above mentioned module. • Registration is only allowed after the research proposal was presented and approved by the postgraduate selection committee. • Additional modules /modules may be required before admission to the MAgric study. • It may be required that some modules be successfully completed by the end of the first year of study for the M Agric degree as a prerequisite for registration of the second year of study for the MAgric degree. • It is required from the student to submit one (1) publishable scientific manuscript when submitting the final dissertation for examination. **M.Agric (Animal Production Management)** • Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a relevant postgraduate selection committee. The following criteria are required: o Bachelor Honours Degree in Animal Production Management with a minimum average of 65%. o Proof of successful completion of the following modules: – AGRI6808, AGRI6814, AGRI6834, AGRI6824, AGRI6844, AGRI6864 OR – equivalent modules for the above mentioned modules. o Registration is only allowed after the research proposal was presented and approved by the postgraduate selection committee. o Additional modules may be required before admission to the M.Agric Animal Production Management degree o It may be required that some modules be successfully completed by the end of the first year of study for the M.Agric Animal Production Management degree as a prerequisite for registration of the second year of study for the MAgric degree. o It is required from the student to submit one (1) publishable scientific manuscript when submitting the final dissertation for examination **Agricultural Economics** • Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a postgraduate selection committee. The following criteria are required: o Bachelor Honours Degree in Agricultural Economics o Proof of successful completion of: – AGEC6815, AGEC6825, AGEC6835, AGEC6800, AGEC6845 OR – equivalent modules for the above mentioned modules. o Registration is only allowed after the research proposal was presented and approved by the postgraduate selection committee. o Additional modules may be required before admission to the M.Agric Agricultural Economics study. o It may be required that some modules be successfully completed by the end of the first year of study for the M.Agric Agricultural Economics degree as a prerequisite for registration of the second year of study. o It is required from the student to submit one (1) publishable scientific article when submitting the final dissertation for examination.
4.	**Master of Disaster Management**	Apart from the General Rules the following is applicable: • A student must in order to be admitted to this Master's programme have: o Appropriate NQF Exit Level 8 Qualification A student must prove to the Academic Departmental Head that he/she has: o adequate knowledge to justify admission to this study. o practical and/or preparatory experience which will be an added advantage. • Minimum admission requirement is PGDip or Honours at NQF level 8 in Disaster Management or related fields. An overall average of 60% and above for the entry qualification (NQF Level 8). • Applicants without a qualification in Disaster Management at NQF level 8 will be required to registered for some PGDip and Master's modules for non-degree purposes. The specific modules will be determined by the AHD.
5.	**Master of Environmental Management**	• No new students will be enrolled for this structured Master of Environmental Management (M4001/ 4796) from 2020. This qualification is replaced by the Master of Science in Environmental Management

6.	**Master of Human Settlements**	Apart from the General Rules the following is applicable: • A student who wishes to enrol for the degree must have a 65% average in one of the following: - an applicable four-year degree plus applicable practical experience and/or applicable preparatory studies, OR - an appropriate Honours Honours Degree or a 4 year Bachelors degree e.g. MURP
7.	**Master of Land and Property Development Management**	In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements: • Students should apply for admission to the programme listed above on the prescribed form before the closing date, 31 August the year before intended registration. • Bachelor of Science Honours or relevant Bachelor Honours Degree on NQF Exit Level 8 with an average of 60% in the exit year of the relevant degree including at least 30 credits of research may be recognised as meeting the minimum entry requirements to this Master's Degree programme. • A selection process takes place before admission. A maximum number of 50 students are admitted owing to classroom constraints.
8.	**Master of Sustainable Agriculture**	Apart from the General Rules the following is applicable: • A student who wishes to enrol for the degree must have one of the following: - an applicable four-year degree plus applicable practical experience and/or applicable preparatory studies, OR - an applicable NQF-level 8 qualification and applicable studies, and/or practical experience. **NB: The scope, nature and applicability of practical experience and preparatory study in Reg. NAS3.4 (a) and (b) above will be determined by the Director of the Centre for Sustainable Agriculture**
9.	**Master of Urban and Regional Planning** *(for extended research)*	Apart from the General Rules the following is applicable: • A student who wishes to enrol for the degree, must have a 65% average in one of the following: - an applicable four-year degree plus applicable practical experience and/or applicable preparatory studies OR - an applicable Honours Degree, or a Bachelor Honours Degree and applicable studies, and/or practical experience.
10.	**Master of Urban and Regional Planning** *(for Professional registration)*	Apart from the General Rules the following is applicable: • A person may be admitted to the programme in Urban and Regional Planning if he/she is in possession of one of the following qualifications with an average pass mark of at least 65% and has the necessary academic background: Bachelor Honours in Urban Regional Planning, or a degree similar to a Bachelor Honours in Urban and Regional Planning (missing modules for the Bachelor Honours in Spatial Planning must be completed). Applicants may have to write selection tests if they are considered to be suitable for selection. These tests, and possible interviews, may be conducted on the Bloemfontein Campus, at a pre-arranged time and date. • If a students is required ti take supplementary courses, they must pass these courses in order to be awarded this degree. • The Head of department in consultation with the Dean may exempt students from taking certain courses if they have completed similar courses in ad different degree at the same NQF level.

11. Master of Science

Apart from the General Rules the following is applicable to the different fields of study:

Actuarial Science, Applied Statistics, Mathematical Statistics or Risk Analysis
- An appropriate Bachelor Honours Degree and mathematical background is required. Admission is subject to the approval of the Academic Departmental Head.

Agricultural Economics
- Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a postgraduate selection committee. The following criteria are required:
  - Bachelor Honours Degree in Agricultural Economics
  - Proof of successful completion of:
    – AGEC6815, AGEC6825, AGEC6835, AGEC6800, AGEC6865 OR
    – equivalent modules for the above mentioned modules.
  - Registration is only allowed after the research proposal was presented and approved by the postgraduate selection committee.
  - Additional modules may be required before admission to the MSc study.
  - It may be required that some modules be successfully completed by the end of the first year of study for the MSc degree as a prerequisite for registration of the second year of study.
  - It is required from the student to submit one (1) publishable scientific manuscript when submitting the final dissertation for examination.

Computer Science and Informatics
- An applicable Honours Degree with a minimum average pass mark of 60% is required.

Construction Management

In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements:
- Bachelor of Science Honours or relevant Bachelor Honours Degree on NQF Exit Level 8 including at least 30 credits of research, may be recognised as meeting the minimum entry requirements to the Master's Degree programme.
- In addition to these requirements the General Rules, as well as the additional Natural and Agricultural Sciences Faculty requirements per discipline.
- It is required from the student to submit one (1) publishable scientific manuscript when submitting the final dissertation for examination.

Data Science
- An applicable Honours Degree with a minimum average pass mark of 60% is required.
- Background in Statistical and Probability Theory, Linear Algebra and Programming, otherwise candidates may be required to enroll for undergraduate/honours modules to obtain the necessary background.
- In exceptional cases students may be allowed in consultation with the Programme Director or Academic Departmental Head.

Environmental Management
- An applicable Bachelor of Science Honours Degree or equivalent qualification on NQF Exit Level 8. Appropriate experience in the environmental sector will be an added advantage for admission consideration by the Centre for Environmental Management (CEM).
- As only a limited number of students can be accepted, a selection form, available from the CEM (cem@ufs.ac.za), must be submitted by the end of September of the preceding year, after which selection will take place.
- Prospective students must also submit a research proposal, after consultation with staff at the CEM, together with the above-mentioned selection form to the CEM. The following email address should be used: cem@ufs.ac.za.

Geohydrology
- An applicable Bachelor Honours Degree with a minimum average pass mark of 60% is required. Additional coursework may be prescribed where students do not have the required background in Geohydrology. In special cases admission may be allowed in consultation with the Director of Institute for Groundwater Studies.

Geology, Geochemistry and Environmental Geology
- An applicable BScHons degree with a minimum average pass mark of 60% is required

Integrated Water Management
- PGDipIWM or an applicable Bachelor of Science Honours Degree or equivalent qualification on NQF Exit Level 8. Appropriate experience in the water sector will be an added advantage for admission consideration by Centre for Environmental Management (CEM). The PGDipIWM should be preceded by a relevant three year Bachelor of Science degree.
- As only a limited number of students can be accepted, a selection form, available from the CEM (iwm@ufs.ac.za), must be submitted by the end of September of the preceding year, after which selection will take place.
- Prospective students must also submit a research proposal, after consultation with staff at the CEM, together with the selection form to the CEM. The following email address should be used: iwm@ufs.ac.za

Limnology
- Students in possession of a BScHons degree in Limnology are admitted to this course for which a dissertation (LIMG8900 – 180 credits) is required. For students in possession of a BScHons or BScAgricultureHons degree in a related field of study additional coursework may be prescribed where students do not have the required background in Limnology. In special cases admission may be allowed in consultation with the Director of the Centre for Environmental Management.

Mathematics or Applied Mathematics
- For admission to a Master's Degree in Mathematics or Applied Mathematics, the student needs Mathematics or Applied Mathematics, or the equivalent at Bachelor Honours level. In addition, all applicants will have to write and pass an admission examination to verify sufficient background and foundational mathematics knowledge. If necessary, students may be required to take additional undergraduate modules as supplementary prerequisites for certain Masters' modules. Proficient performance in the TALPS Test is required before enrolment.

Mineral Resource Management
- An applicable BScHons degree with a minimum average pass mark of 60% is required
- A minimum of at least 2 years working experience within the Mining Industry.

12.	**Master of Science** *(continued)*	**Property Science** In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements: • Bachelor of Science Honours or relevant Bachelor Honours Degree on NQF Exit Level 8 including at least 30 credits of research may be recognised as meeting the minimum entry requirements to the Master's Degree programme. • In addition to these requirements the General Rules, as well as the additional Natural and Agricultural Sciences Faculty requirements per discipline. • It is required from the student to submit one (1) publishable scientific manuscript when submitting the final dissertation for examination. **Quantity Surveying** In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements: • Bachelor of Science Honours or relevant Bachelor Honours Degree on NQF Exit Level 8 including at least 30 credits of research may be recognised as meeting the minimum entry requirements to the Master's Degree programme. • In addition to these requirements the General Rules, as well as the additional Natural and Agricultural Sciences Faculty requirements per discipline. • It is required from the student to submit one (1) publishable scientific manuscript when submitting the final dissertation for examination.
13.	**Master of Science in Agriculture**	Apart from the General Rules the following is applicable: • The students must provide evidence that he/she has adequate knowledge of the subject to justify admission to the study. • In the case of Agronomy, Agrometeorology Animal, Grassland Science and Food Science admission to the study is subject to the approval of a postgraduate selection committee and Academic Departmental Head. Approval will be based on a satisfactory study record and appropriate qualification, or experience obtained. Additional modules may be required before admission to the MScAgric study is granted. **MSc.Agric (Animal Science)** Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a relevant postgraduate selection committee. The following criteria are required: • BSc.Agric Degree in Animal Science with a minimum average of 60% in the final year. • A minimum average of 65% in discipline specific final year modules. • Additional module(s) and/or examination(s) may be required before admission to the MSc.Agric (Animal Science) degree. • It is required from the student to submit one (1) publishable scientific manuscript when submitting the final dissertation for examination **MScAgric (Food Science):** Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a postgraduate selection committee. The following criteria are required: • An average of 65% in second and third year Food Science modules and a weighted average of 60% in 4th year Food Science modules. At least 120 credits in Food Science at fourth-year level.
14.	**Master of Irrigation Management**	Apart from the General Rules the following is applicable: • A student who wishes to enrol for the degree must have a 60% average in one of the following: - an appropriate Honours Degree degree plus applicable practical experience - the study is subject to the approval of a postgraduate selection committee and Academic Departmental Head. Approval will be based on a satisfactory study record and appropriate qualification or experience obtained.

NAS3.5 – Admission requirements for a Doctoral Degree

In addition to the admission requirements contained in the GENERAL RULES, a student has to comply with the following additional Faculty requirements:

(a) All PhD degrees are selection programmes and admission to these degrees is subject to approval by the Academic Departmental Head.

(b) The PhD student must show that he/she has sufficient knowledge of the subject prior to admission. Students should apply for admittance to the Doctoral Degree on the prescribed form. These forms should be completed and submitted to the Academic Departmental Head.

(c) The PhD student must have a Master's Degree or equivalent NQF Exit Level 9 qualification. Master's Degrees include: MArch, MLPM, MSc, MAgric, MSc (Agriculture), MEM, MSA, MSc (Construction Management), MSc (Quantity Surveying), MURP, or MDM. The following additional requirements for specifics disciplines apply:

NAS3.6 – Specific programme requirements for Doctoral Degrees:

1. Agricultural Economics	Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a postgraduate selection committee. The following criteria are required: • Registration is only allowed after the research proposal was presented and approved by the postgraduate selection committee. • Additional modules may be required before admission to the PhD study. • It may be required that some modules be successfully completed by the end of the first year of study for the PhD degree as a prerequisite for registration of the secondyear of study for the PhD degree.
2. Agricultural Management	Admission to the study is subject to the discretion and approval of the Academic Departmental Head and a postgraduate selection committee. The following criteria are required: • Registration is only allowed after the research proposal was presented and approved by the postgraduate selection committee. • Additional modules may be required before admission to the PhD study. • It may be required that some modules be successfully completed by the end of the first year of study for the PhD degree as a prerequisite for registration of the second year of study for the PhD degree.
3. Disaster Management	• In order to be admitted to the PhD, a student must be in possession of an relevant Master's Degree and specific/relevant modules in the Postgraduate Diploma in Disaster Management. Depending on the background and knowledge that the applicant has, some core disaster management modules may be required in order to equip the student with adequate disaster management knowledge.
4. Environmental Management	• In order to comply with the admission requirements, a student must possess a Master's of Environmental Management Degree before registering for the PhD degree. Individuals holding another Master's Degree may be considered for admission, but could be required to register for additional modules. • Registration is only allowed after the research proposal was presented and approved by the research committee at the Center for Environmental Management.
5. Limnology	• In order to be admitted to the PhD, a student must be in possession of an MSc majoring in Limnology. • Registration is only allowed after the research proposal was presented and approved by the research committee at the Center for Environmental Management.
6. Microbial Biotechnology	• A student must be in possession of a Master's Degree in Microbiology, Biochemistry, Food Science, Microbial Biotechnology or related disciplines. Students in possession of a Master's Degree in related modules (e.g. Botany, Zoology, Chemistry, Chemical Engineering) can be requested by the Programme Director to complete additional theoretical work, work assignments, and/or modules before the thesis is submitted for examination.
7. Geology/Geochemistry and Environmental Geology	• An applicable MSc with a pass mark of at least 60%.

NAS4 – PROGRESS REQUIREMENTS

Rules A5(a) indicates that a student must complete his/her studies in the minimum prescribed study period plus two years. This is known as the residential period. Most of the undergraduate programmes in this Faculty thus have a residential period of five years, except BScAgriculture and BSc Extended Curriculum Programmes which have a six-year residential period.

a) Students must successfully complete a minimum of 64 mainstream credits per year to be allowed to register the following year. Students who do not obtain a minimum of 64 credits per year will automatically be **BLOCKED FOR REGISTRATION** in the Faculty. They may re-apply in order to be considered to be **RE-ADMITTED** to this Faculty.
Students must therefore pass a minimum of 32 credits per semester to be allowed to register the following semester. Students who fail to obtain 32 credits after the first semester will automatically be blocked for registration. They can appeal to the Faculty Appeal Committee for re-admission. The appeal form must be completed and submitted to the Office of the Dean two days after the results of the supplementary examination are available.

b) Students will only be allowed to repeat a module once if they meet the minimum requirements for repetition.
If a student only requires 32 credits to obtain a qualification and has not exceeded the residential period, special permission may be granted to repeat a module for the **SECOND** time. No first-year module can be repeated more than once.

c) In order to repeat a module, a student must have completed that module and obtained a semester mark of at least 30%. Students can follow the appeal process and the Appeal Committee could consider the matter on the basis of merit.

d) Students in the Faculty of Natural and Agricultural Sciences will only be allowed to repeat 9 modules in their three-year study programme or repeat 12 modules in their four-year study programme.

e) Class attendance is compulsory for students who have to register for the same module a second time. In the event of timetable clashes between repeated and new modules, preference must be given to the module being repeated. In such cases, students may not register for the new module.
f) Students who do not pass all their required first-year modules (at least 120 main stream credits) in three years, and have at least obtained 48 second-year credits, will not be allowed to re-register to the Faculty of Natural and Agricultural Sciences.
g) Students must pass a minimum of 80 credits to be able to register for modules in a **SUBSEQUENT** study year of a learning programme.
h) Students cannot register for third-year modules if any first-year modules are outstanding.
i) Students must complete their degrees within the residential period. If it becomes evident that the student will not be able to comply with this rule, the student can be deregistered even if the residential period has not been reached.
j) Students who do not comply with i), but have a maximum of 4 modules outstanding, will only be allowed to conditionally register for one more semester. The student must then pass all the modules that they are registered for in that semester. Approval by the Faculty Admissions Committee is needed. Applications for conditional registration close on 31 August of their fifth study year for outstanding first semester modules and 31 January after completion of their fifth year for outstanding second semester modules.
k) Students repeating modules can only register for a maximum of 64 credits per semester. Special permission may be granted for adding one 16-credit module.
l) Students may only register for one additional 16-credit module per semester, over and above the number of prescribed modules required in the learning programme. Approval will depend on the academic record of the student.
m) Opportunity exists in the Faculty of Natural and Agricultural Sciences to appeal against the decision made by the Programme Director and/or delegated representative. A student may submit an appeal to a decision, which must contain supporting documentation that substantiates the situation, to the Appeals Committee of the Faculty. The Appeals Committee consists of the Teaching and Learning Manager and at least two other senior academics within the faculty. The Appeals Committee deliberates the cases before the semester starts. Appeal applications must be submitted to the Office of the Dean five working days before the semester starts. Results of the appeal will be available before the semester starts.
n) Students must obtain at least 45% for a semester mark to participate in the examination.

NAS5 – MODULE REQUIREMENTS

(a) Students must comply with the requirements of the specific programme and specific modules. All prerequisites for modules presented in the learning programmes in the Faculty are provided in the study guides as well as the rule book at MODULE LIST WITH PREREQUISITES PER DEPARTMENT on page 105.
(b) Some modules require selection and students will only be allowed to register for that specific module after approval of the Programme Director.
(c) Students who passed Grade 12 Information Technology at performance level 5 or Computer Application Technology (CAT) at performance level 6 are exempted from CSIQ1531/CSIL1551/CSIL1511 and CSIQ1541/CSIL1561/CSIL1521.
(d) For some modules a minimum prerequisite applies. The requirement is a semester/year mark or an examination mark of 40% in the relevant module. It is indicated as, for example, Min. (BTNY2616), if BTNY2616 is the relevant module.
(e) If a co-requisite is required and the modules are taken for the first time, the module prescribed as co-requisite must be taken simultaneously with the relevant module. For example, to take GLGY2642, the prerequisites are 55% average for GLGY1614 and GLGY1624 and the co-requisite with GLGY2644.

NAS6 – STUDENTS FROM OTHER FACULTIES

(a) Students from other faculties who register for modules in the Faculty of Natural and Agricultural Sciences must comply with the minimum regulation requirements, as set out in NAS2.1 and NAS2.2.

NAS7 – LEARNING PROGRAMME

Students have to:
- Select a learning programme.
- Follow the specific prescribed curriculum.
- Select one of the Biological Sciences, Mathematical Sciences, Chemical and Physical Science, Geosciences, Computer Science and Informatics, Computer Information Systems and Consumer Sciences fields of study for BSc degrees; or Soil Crop and Climate, Animal Wildlife and Grassland, Agricultural Economics, or Food Science for one of BScAgriculture degrees; or Crop Production, or Animal Production fields of study for the BAgric degrees.
- Verify that all the selected modules are included in the **class and examination timetable**.
- Verify that the **prerequisites** prescribed for every module are met.
- Be aware that elective modules can be exchanged with each other, but all compulsory modules must be successfully completed.

NAS7.1 – The selection of a learning programme

a) Students are only allowed to change to different fields of study or degrees within the Faculty at the end of their first year of study. If a student changes from one field of study to another, the total degree residential period must not exceed a maximum of five or six years, depending on the field of study.

b) Students can change within fields of study only up to the second year of study; this does not grant them permission to extend the duration of study beyond five years.
c) Students who change from one major within a complementary learning programme could have an extension on their study duration.

NAS7.2 – Minimum credit allocation

A degree cannot be conferred if the minimum credit requirements are not met and the prescribed curriculum are not fully completed:

(a) **All three-year Degrees:**
If a student wants endorsement with **two majors,** at least 60 credits per major discipline at NQF Exit Level 7 is required. This only apply to specific qualifications that allow for two majors.

(b) **BArch, BAgric, BConsSc, BCompInfoSys, BSc, BSc (Information Technology), BSc in Quantity Surveying or BSc in Construction Management:**
A minimum of at least 120 credits on NQF Exit Level 7 must be obtained. At least 60 credits must be from one discipline and at NQF Exit Level 7. For BSc (Quantity Surveying) and BSc (Construction Management) the 60 credits at NQF Exit Level 7 will not be from one discipline.

(c) **BSc Extended Curriculum Programme (four years):**
A total of at least 464 credits of which at least 104 credits must be developmental modules and at least 120 credits at NQF Exit Level 7 must be obtained over four study years.

(d) **BSc (Agriculture), BSc (Consumer Science) (four years):**
A total of at least 480 credits, with a maximum of 96 credits at NQF Level 5 and at least 120 credits at NQF Exit Level 8 for the degree must be obtained over four years. At least 60 credits must be from the minor discipline at NQF Exit Level 7.

(e) **BSc (Agriculture) Extended Curriculum Programme (five years):**
A total of at least 592 credits, of which at least 108 credits must be developmental modules, a maximum of 208 credits at NQF Level 5 and at least 120 credits at NQF Exit Level 8 must be obtained over five study years.

NAS8 – ASSESSMENT EXAMINATION AND PROMOTION

NAS8.1 – Examination and promotion system

In addition to the requirements contained in the GENERAL RULES, a student has to comply with the additional Faculty requirements:

(a) The guidelines as set out in the study guide for assessment method and calculation of semester and final marks apply.
(b) The promotion system only applies to specific modules as indicated in the study guides. Students who obtain a semester mark of 70% or higher in a specific module can be promoted if the promotion system applies to the module. The module mark becomes the final mark for the module.
(c) The degree is awarded with distinction to a student who obtained a weighted average of 75% in the prescribed final year modules and if the programme was completed in the prescribed minimum study years.

NAS8.2 – Assessment for Departments of Architecture, and Urban and Regional Planning

(a) For most of the modules presented by the Department of Architecture, Urban and Regional Planning, assessment of the student's academic progress will take place on a continuous basis by means of assignments, tests and/or design tasks as specified in the module guide. The acknowledgment of a year/semester mark obtained will be subject to satisfactory attendance at lectures, studio periods and seminars. A final mark which will be taken as the student's examination mark will be compiled from the marks obtained in the assessments mentioned above.
(b) Modules presented by departments other than Architecture will be subject to the assessment procedure of those departments.
(c) Students in the Department of Architecture must meet the prescribed sub-minimum of 30% for all assignments and design tasks as specified in the module guides to pass a module.
(d) For the honours research report and master's mini-dissertation in the Department of Urban and Regional Planning, assessment occurs through internal assessment, which can include assignments and/ or oral presentations and/ or review of the final document by an internal reviewer. Internal assessment can contribute up to 50% of the final mark. The external assessment of the report or mini-dissertation occurs as per the requirements in the general rules, and must make up at least 50% of the final mark. To pass the report or mini-dissertation, it is necessary for the student to pass both internal and external assessment.

NAS8.3

In addition to the requirements contained in the GENERAL RULES a student has to comply with the additional Faculty requirements:

(a) To gain admission to the examination in a module in the Faculty of Natural and Agricultural Sciences, a module mark of at least 45% is required.

NAS9 – READMISSION RULES

Readmission in the Faculty of NAS is defined as an application for admission to a programme by an applicant or student who was previously admitted and enrolled to study at UFS in any undergraduate programme.
The aim of the rules is to ensure alignment with the NAS progression rules (NAS4 par (a-p)) in order not to penalise or disadvantage students presently in the system. The main aim would be to facilitate progress within the normal residential period plus six months not counting the years of disruption in study. The following principles will guide the decisions:

- Previous academic performance,
- Improved academic performance at other academic institutions, if the applicant or student enrolled at another institution after they left the UFS,
- Proof of any form of rehabilitation or improved conditions in terms of mental, emotional and physical health
- At least one year of non-registration after academic exclusion – unsuccessful academic appeal
- Recognition of successfully employment of at least one or two years
- Improved financial situation
- Proof of an aptitude test

a) Students applying for re-admission must meet the current admission requirements for the specific programme they applied for.
b) Students who have failed, discontinued or have incomplete modules for more than 45% of ALL credits EVER REGISTERED at the UFS will NOT be readmitted to the faculty.
c) Students who have to register for more than TWO modules for the third time will not be readmitted.
d) If a student has already obtained a relevant undergraduate qualification with Mathematics, Chemistry or Biology in the first year, the marks obtained in those modules could be used to overrule the admission requirements related to the NCS for Mathematics, Physical Science and Life Science.
e) Students readmitted in the faculty must be able to complete the degree in the required residential period with a maximum extension of six months this implies that (These rules apply for extended students as well but they have one extra residential year so the first year is split into two years):
    i. A student who was already registered four years at the UFS must have completed the total first and second year modules (Time to complete 18 months allowed to register for max of 128 credit per year)
    ii. A student who was already registered for three years at the UFS must have completed the total first year and at least the second year modules for one of the major subjects (Time to complete 30 months allowed to register for max of 128 credit per year)
    iii. A student who was already registered for two years must have completed at least 75% of their first year mainstream modules including the first year modules required as prerequisites for the major modules and all other developmental or required modules like UFS101, EALN1508, CSIL1511 and CSIL1561. (Time to complete 42 months allowed to register for max of 128 credit per year)
    iv. A student who was registered for only one year must have completed at least 50% of the first year mainstream modules and at least 32 credits of developmental or required modules like UFS101, EALN1508, CSIL1511 and CSIL1561. (Time to complete 54 months allowed to register for a maximum of 128 credit per year).
f) If the programme the student was registered before does not exist on the PQM any longer, the student will be readmitted to the new programme of choice and the student needs to comply with the present admission requirements for the programme.
g) If the student has successfully completed the mathematics, chemistry, physics and biology requirements for the first year of the programme they want to be readmitted in, although they do not meet the NSC admission requirements for that specific programme the student can, based on the performance in mathematics, chemistry, physics and biology be admitted to the programme.
h) NQF level 7 modules done in the past 3 years can be recognised. If the NQF level 7 modules were passed more than 3 years ago, the student will have to repeat those modules.
i) NQF level 6 modules done in the past 6 years can be recognised. If the NQF level 6 modules were passed more than 6 years ago, the student will have to repeat those modules.
j) First year modules will not have a shelf life except where differently indicated in the rulebook of the Faculty.
k) Students transferring from other universities who have not yet obtained a similar undergraduate degree have to be registered for at least 120 credits modules on NQF level 7 at the UFS.
l) Students who were denied access in a readmission application cannot appeal the decisions.
m) If a student passed less than 64 credits in his/her 1st year of study and the student did not take a break exceeding the previous two years of study, then the student is allowed to register for his/her 1st year modules for a second time. This includes incomplete modules and modules for which the student obtained less than 30%. After the 1st semester, if a student is unable to continue with any second semester modules due to failing his/her prerequisite 1st semester modules, the student should be de-registered for the second semester of UFS101 and/or EALN1508 and re-register for them in the following year along with the modules that they failed. This rule is not applicable to the BSc Extended Curriculum Programmes and University Access Programmes. This rule will overrule certain NAS9 rules if the applicant meets the requirements as set above.
n) For students from other faculties NAS9 par (m) will not apply, the student must comply with NAS4 par (a) to transfer to the NAS faculty.
o) The extended rule for the faculty will also apply to extended students dependant that they can complete their qualification within the residential period, which is mainstream time plus one year. The extended rule implies that if a student has passed all the first year modules in the first two years of study and in the third year of study failed all first semester modules which are prerequisites for the second semester modules. This student will be allowed back for 6 months with the requirement that they pass at least 64 credits in the first semester.
p) Students from other institutions (transferring students) must meet the current minimum admission requirements for the programme they applied for. Poor academic performance at the institution transferring from can also disqualify the student from being considered for admission even if the current minimum admission requirements are met.
q) Students who completed Grade 12 or equivalent prior to the year 2010 could be evaluated by the Committee with consideration of their age, therefore certain deviations could be applicable.

11. QUALIFICATIONS IN THE FACULTY

11.1 BACHELOR'S DEGREES AND DIPLOMAS		MINIMUM PERIOD OF STUDY	NQF EXIT LEVEL	NUMBER OF LEARNING PROGRAMMES	ABBREVIATION	PAGE
DIPLOMA						
1	Advanced Diploma in Sustainable Agriculture and Rural Development	18 months	7	1	AdvDip(ASARD)	49
	ACCESS PROGRAMMES AND EXTENDED CURRICULUM PROGRAMMES – South Campus first year of study					
1	University Access Programme: Agricultural Sciences for BAgric	1 year	5	1	UAP Agric	50
2	University Access Programme: Natural and Agricultural Sciences for BSc	1 year	5	1	UAP Mathematics & Chemistry	50
3	Bachelor of Agriculture Extended	4 years	7	1	BAgric	51
4	Bachelor of Science in Agriculture Extended Curriculum Programme	5 years	8	1	BSc (Agriculture)	51
5	Bachelor of Science Extended Curriculum Programme (Mathematics and Chemistry)	4 years	7	1	BSc	52
6	Bachelor of Science Extended Curriculum Programme (Mathematics and Finances)	4 years	7	1	BSc	52
BACHELOR'S DEGREES						
1	Bachelor of Architecture	3 years	7	1	BArch	53
2	Bachelor of Agriculture	3 years	7	7	BAgric	54-56
3	Bachelor of Computer Information Systems	3 years	7	1	BCompInfoSys	56
4	Bachelor of Consumer Sciences	3 years	7	2	BConsumer Science	57
5	Bachelor of Science	3 years	7	6 (68)	BSc	58-74
6	Bachelor of Science in Information Technology	3 years	7	5	BSc (Information Technology)	68-69
7	Bachelor of Science in Construction Economics and Management (Residential)	3 years	7	2	BSc Construction Economics and Management	65
8	Bachelor of Science in Construction Management (Compact learning)	4 years	7	1	BSc Construction Management	65
9	Bachelor of Science in Quantity Surveying (Residential and Compact learning)	4 years	7	1	BSc in Quantity Surveying	
10	Bachelor of Science in Agriculture	4 years	8	4 (31)	BSc (Agriculture)	75-83
11	Bachelor of Science in Consumer Science	4 years	8	1	BSc (Consumer Science)	58

11.2 POSTGRADUATE DIPLOMAS, BACHELOR, HONOURS, MASTER'S AND DOCTORAL DEGREES		MINIMUM PERIOD OF STUDY	NQF EXIT LEVEL	NUMBER OF LEARNING PROGRAMMES	ABBREVIATION	PAGE
POSTGRADUATE DIPLOMA						
1	Postgraduate Diploma in Disaster Management	1 year	8	1	PGDip (Disaster Management)	83
2	Postgraduate Diploma in Integrated Water Management	1 year	8	1	PGDip(IWM)	83
3	Postgraduate Diploma in Sustainable Agriculture	1 year	8	1	PGDip(SA)	83
BACHELOR HONOURS DEGREES						
1	Bachelor of Architecture Honours	1 year	8	1	BArchHons	84
2	Bachelor of Agriculture Honours	1 year	8	3	BAgricHons	84
3	Bachelor of Science Honours in Agricultural Economics					84
4	Bachelor of Science Honours in Consumer Science	1 year	8	1	BScHons (Consumer Science)	85
5	Bachelor of Science Honours	1 year	8	35	BScHons	87-93
6	Bachelor of Science Honours majoring in Construction Management (Residential/Compact learning)	1/ 2 year	8	1	BScHons majoring in Construction Management	88
7	Bachelor of Science Honours majoring in Quantity Surveying (Residential/Compact learning)	1/ 2 year	8	1	BScHons majoring in Quantity Surveying	89
8	Bachelor of Spatial Planning Honours	1 year	8	1	BSPHons	85
9	Bachelor of Spatial Planning Honours (specialising in Human Settlements)	1 year	8	1	BSPHons (specialising in Human Settlements)	86
10	Bachelor of Computer Information Systems Honours	1 year	8	1		94
MASTER'S DEGREES						
1	Master of Architecture (Research or specialising in Design)	2 years	9	1	MArch	95
2	Master of Architecture (Professional)	1 year	9	1	MArch	95
3	Master of Agriculture	1 year	9	1	MAgric	95
4	Master of Disaster Management	1 years	9	1	MDM	96
6	Master of Human Settlements	1 year	9	1	MHS	97
7	Master of Land and Property Development Management	2 years	9	1	MLPM	97
8	Master of Sustainable Agriculture	1 years	9	1	MSA	96
9	Master of Science	2 years	9	37	MSc	98
10	Master of Science in Agriculture	2 years	9	14	MSc (Agriculture)	102
11	Master of Science in Consumer Science	1 year	9	1	MSc (Consumer Science)	101
14	Master of Urban and Regional Planning (Professional)	1 year	9	1	MURP	103
15	Master of Urban and Regional Planning (Research)	1 year	9	1	MURP	102
DOCTORAL DEGREES						
1	Doctor of Philosophy	2 years	10	57	PhD	104-105
2	Doctor of Science	2 years	10	50	DSc	106

11.3 LEARNING PROGRAMMES AND REQUIREMENTS

DIPLOMAS AND ADVANCE DIPLOMAS

CAREER	PROGRAMME (PROG) CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS
UGRD	B5250	52501	BC520047		Advanced Diploma in Sustainable Agriculture and Rural Development	Dr J van Niekerk	A related diploma or qualification at NQF Level 6.

UNIVERSITY EXTENDED CURRICULUM PROGRAMMES

CAREER	PROG CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS				
							AP	NSC % IN TUITION LANGUAGE	NSC LEVEL MATHS	NSC LEVEL PHYSICAL SCIENCE	NSC LEVEL LIFE SCIENCE
UGRD	B43E1	43001	BC4300E1	88	Bachelor of Science Extended Degree Mathematics and Chemistry	Mr P Bothma	22	40%	40%	40% or	40%
UGRD	B43E2	43001	BC4300E2	96/100/104	Bachelor of Science Extended Degree Mathematics and Finances	Mr P Bothma	22	40%	40%	N/A	N/A
UGRD	B54E1	54801	BC5480E1	88	Bachelor of Science Extended Degree Agriculture	Mr E Jacobs	22	40%	40%	40% or	40%
UGRD	B53E1	53001	BC5300E1	64	Bachelor of Agriculture Extended Degree	Mr E Jacobs	22	40%	30% for Maths or 60% for Maths Lit	N/A	N/A

BACHELOR DEGREE PROGRAMMES

CAREER	PROG CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS				
							AP	NSC % IN TUITION LANGUAGE	NSC LEVEL MATHS	NSC LEVEL PHYSICAL SCIENCE	NSC LEVEL LIFE SCIENCE
UGRD	B4391	43911	BC430114	376	Bachelor of Architecture	Mr K du Preez	30	50%	50%	N/A	N/A
UGRD	B5350	53501	BC530111	396	Bachelor of Agriculture majoring in Agricultural Economics	Dr J Henning	30	50%	50%	N/A	N/A
UGRD	B5350	53501	BC530147	376	Bachelor of Agriculture majoring in Agricultural Extension	Dr I van der Merwe	30	50%	40% of maths Lit 80% AP>31	N/A	N/A
UGRD	B5350	53501	BC530152	376	Bachelor of Agriculture majoring in Agricultural Management	Dr J Henning	30	50%		N/A	N/A
UGRD	B5300	53501	BC530101	392	Bachelor of Agriculture majoring in Animal Production Management	Dr M Fair	30	50%		N/A	N/A
UGRD	B5300	53501	BC530102	392	Bachelor of Agriculture majoring in Crop Production Management	Dr E van der Watt	30	50%		N/A	N/A
UGRD	B5300	53501	BC530103	384/388	Bachelor of Agriculture majoring in Mixed Farming Management	Dr J Henning	30	50%		N/A	N/A
UGRD	B5300	53501	BC530172	392	Bachelor of Agriculture majoring in Irrigation Management	Dr E van der Watt	30	50%		N/A	N/A
UGRD	B5300	53501	BC530190	404/408	Bachelor of Agriculture majoring in Wildlife Management	Dr J Henning	30	50%		N/A	N/A
UGRD	B4363	43610	BC430156	400	Bachelor of Computer Information Systems	Mr J Marais	30	50%	50%	N/A	N/A
UGRD	B4371	43710	BC430123	376	Bachelor of Consumer Science	Dr I van der Merwe	30	50%	30% for Maths or 60% for Maths Lit	N/A	N/A
UGRD	B4350	43001	BC431100	412	Bachelor of Science majoring in Agricultural Economics	Dr J Henning	32	50%	60%	N/A	N/A
UGRD	B4310	43001	BC431920	396/404	Bachelor of Science majoring in Biochemistry and Botany	Prof. B Visser	32	50%	60%	60%	60%
UGRD	B4310	43001	BC431927	396	Bachelor of Science majoring in Biochemistry and Entomology	Dr C Jansen van Rensburg	32	50%	60%	60%	60%
UGRD	B4310	43001	BC431931	396	Bachelor of Science majoring in Biochemistry and Genetics	Dr F O'Neill	32	50%	60%	60%	60%
UGRD	B4310	43001	BC431939	376	Bachelor of Science majoring in Biochemistry and Microbiology	Prof. J Albertyn	32	50%	60%	60%	60%
UGRD	B4310	43001	BC431980	396	Bachelor of Science majoring in Biochemistry and Physiology	Dr F O'Neill	32	50%	60%	60%	60%
UGRD	B4310	43001	BC431946	396	Bachelor of Science majoring in Biochemistry and Statistics	Dr F O'Neill	32	50%	60%	60%	60%
UGRD	B4310	43001	BC431949	396	Bachelor of Science majoring in Biochemistry and Zoology	Dr C Jansen van Rensburg	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432027	396	Bachelor of Science majoring in Botany and Entomology	Dr C Jansen van Rensburg	32	50%	60%	60%	60%

CAREER	PROG CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS				
							AP	NSC % IN TUITION LANGUAGE	NSC LEVEL MATHS	NSC LEVEL PHYSICAL SCIENCE	NSC LEVEL LIFE SCIENCE
UGRD	B4310	43001	BC432031	388	Bachelor of Science majoring in Botany and Genetics	Prof. B Visser	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432039	428	Bachelor of Science majoring in Botany and Microbiology	Prof. B Visser	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432041	404	Bachelor of Science majoring in Botany and Plant Breeding	Prof. B Visser	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432042	416	Bachelor of Science majoring in Botany and Plant Pathology	Prof. B Visser	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432049	404	Bachelor of Science majoring in Botany and Zoology	Prof. B Visser	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432082	404	Bachelor of Science majoring in Plant Health Ecology	Prof. B Visser	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432731	388	Bachelor of Science majoring in Entomology and Genetics	Dr C Jansen van Rensburg	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432739	412	Bachelor of Science majoring in Entomology and Microbiology	Dr C Jansen van Rensburg	32	50%	60%	60%	60%
UGRD	B4310	43001	BC432749	388	Bachelor of Science majoring in Entomology and Zoology	Dr C Jansen van Rensburg	32	50%	60%	60%	60%
UGRD	B4311	43001	BC433031	380	Bachelor of Science majoring in Forensic Science	Dr K Ehlers	34	50%	Maths 60% and a cumulative score for Maths, Physical Science and Life Science > 17		
UGRD	B4310	43001	BC433118	400	Bachelor of Science majoring in Behavioural Genetics	Mrs Z Murray	32	50%	60%	60%	60%
UGRD	B4310	43001	BC433139	388	Bachelor of Science majoring in Genetics and Microbiology	Prof. J Albertyn	32	50%	60%	60%	60%
UGRD	B4310	43001	BC433180	412	Bachelor of Science majoring in Genetics and Physiology	Mrs Z Murray	32	50%	60%	60%	60%
UGRD	B4310	43001	BC433149	396	Bachelor of Science majoring in Genetics and Zoology	Dr C Jansen van Rensburg	32	50%	60%	60%	60%
UGRD	B4310	43001	BC433946	412	Bachelor of Science majoring in Microbiology and Statistics	Prof.J Albertyn	32	50%	60%	60%	60%
UGRD	B4310	43001	BC433949	412	Bachelor of Science majoring in Microbiology and Zoology	Dr C Jansen van Rensburg	32	50%	60%	60%	60%
UGRD	B4310	43001	BC433689	412	Bachelor of Science Majoring In Rangeland and Wildlife Ecology	Dr M Fair	32	50%	60%	60%	60%
UGRD	B4393	43901	BC432401	392	Bachelor of Science in Construction Management (compact learning)	Mr HB du Plessis	32	50%	60%	50% in one of Economics, Business Studies, Accounting or Physical Science	
UGRD	B4392	43901	BC432443	392	Bachelor of Science in Construction Management	Mrs T Bremer	32	50%	60%		
UGRD	B4392	43902	BC434300	392	Bachelor of Science in Quantity Surveying	Mrs T Bremer	32	50%	60%		
UGRD	B4393	43902	BC434301	392	Bachelor of Science in Quantity Surveying (compact learning)	Mr HB du Plessis	32	50%	60%		
UGRD	B4330	43001	BC432119	412	Bachelor of Science majoring in Chemistry and Biochemistry	Dr J Venter	32	50%	60%	60%	60%
UGRD	B4330	43001	BC432120	412	Bachelor of Science majoring in Chemistry and Botany	Dr J Venter	32	50%	60%	60%	60%
UGRD	B4330	43001	BC432139	412	Bachelor of Science majoring in Chemistry and Microbiology	Dr J Venter	32	50%	60%	60%	60%
UGRD	B4330	43001	BC432140	380	Bachelor of Science majoring in Chemistry and Physics	Dr J Venter	32	50%	60%	60%	N/A
UGRD	B4331	43001	BC434012	364	Bachelor of Science majoring in Physics and Agrometeorology	Dr J Venter	32	50%	60%	60%	60%
UGRD	B4331	43001	BC434017	388	Bachelor of Science majoring in Physics and Astrophysics	Dr J Venter	32	50%	70%	60%	N/A
UGRD	B4332	43001	BC434026	480	Bachelor of Science majoring in Physics and Engineering Subjects	Dr J Venter	34	50%	60%	60%	N/A
UGRD	B4360	43601	BC432221	380	Bachelor of Science in Information Technology majoring in Computer Science and Chemistry	Mr J Marais	32	50%	60%	60%	N/A
UGRD	B4362	43601	BC432295	388	Bachelor of Science in Information Technology majoring in Data Science	Mr J Marais	32	50%	70%	60%	N/A
UGRD	B4361	43601	BC432238	388	Bachelor of Science in Information Technology majoring in Computer Science and Mathematics	Mr J Marais	32	50%	70%	60%	N/A
UGRD	B4360	43601	BC432240	380	Bachelor of Science in Information Technology majoring in Computer Science and Physics	Mr J Marais	32	50%	60%	60%	N/A
UGRD	B4364	43601	BC432255	380	Bachelor of Science in Information Technology majoring in Computer Science and Business Management	Mr J Marais	32	50%	50%	50%	N/A
UGRD	B4342	43001	BC433369	408	Bachelor of Science majoring in Geo-Informatics	Miss E Kruger	32	50%	60%	60%	N/A
UGRD	B4340	43001	BC433312	380	Bachelor of Science majoring in Geography and Agrometeorology	Miss E Kruger	32	50%	60%	60%	60%
UGRD	B4342	43001	BC433346	376	Bachelor of Science majoring in Geography and Statistics	Miss E Kruger	32	50%	60%	60%	N/A
UGRD	B4340	43001	BC433362	392	Bachelor of Science majoring in Geography and Environmental Science	Miss E Kruger	32	50%	60 %	60%	60%

CAREER	PROG CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS				
							AP	NSC % IN TUITION LANGUAGE	NSC LEVEL MATHS	NSC LEVEL PHYSICAL SCIENCE	NSC LEVEL LIFE SCIENCE
UGRD	B4341	43001	BC433521	416	Bachelor of Science majoring in Geology and Chemistry	Mrs J Magson	32	50%	60%	60%	N/A
UGRD	B4341	43001	BC433528	400	Bachelor of Science majoring in Environmental Geology	Mrs J Magson	32	50%	60%	60%	N/A
UGRD	B4341	43001	BC433532	400	Bachelor of Science majoring in Geochemistry	Mrs J Magson	32	50%	60%	60%	N/A
UGRD	B4341	43001	BC433533	416	Bachelor of Science majoring in Geology and Geography	Mrs J Magson	32	50%	60%	60%	N/A
UGRD	B4341	43001	BC433535	384	Bachelor of Science majoring in Geology Specialisation	Mrs J Magson	32	50%	60%	60%	N/A
UGRD	B4341	43001	BC433540	400	Bachelor of Science majoring in Geology and Physics	Mrs J Magson	32	50%	60%	60%	N/A
UGRD	B4324	43001	BC431000	460	Bachelor of Science majoring in Actuarial Science	Dr M von Maltitz	34	50%	70%	N/A	N/A
UGRD	B4323	43001	BC433712	388	Bachelor of Science majoring in Climate Sciences	Dr M von Maltitz	32	50%	70%	60%	N/A
UGRD	B4322	43001	BC433758	388	Bachelor of Science majoring in Econometrics	Dr M von Maltitz	32	50%	70%	N/A	N/A
UGRD	B4321	43001	BC433816	380	Bachelor of Science majoring in Mathematics and Applied Mathematics	Mr C Venter	32	50%	70%	60%	N/A
UGRD	B4321	43001	BC433821	366	Bachelor of Science majoring in Mathematics and Chemistry	Mr C Venter	32	50%	70%	60%	N/A
UGRD	B4321	43001	BC433837	380	Bachelor of Science majoring in Mathematics and Mathematical Statistics	Mr C Venter	32	50%	70%	60%	N/A
UGRD	B4321	43001	BC433840	380	Bachelor of Science majoring in Mathematics and Physics	Mr C Venter	32	50%	70%	60%	N/A
UGRD	B4325	43001	BC434658	384	Bachelor of Science majoring in Statistics and Economics	Dr M von Maltitz	32	50%	60%	N/A	N/A
UGRD	B4325	43001	BC434686	392	Bachelor of Science majoring in Statistics and Psychology	Dr M von Maltitz	32	50%	60%	N/A	N/A
PROFESSIONAL BACHELOR'S DEGREE PROGRAMMES											
UGRD	B5480	54801	BC540012	520	Bachelor of Science in Agriculture majoring in Agrometeorology	Dr E van der Watt	32	50%	60%	50% for Physical Science or 60% for Life Science or 60% for Agricultural Sciences	
UGRD	B5480	54801	BC540013	520	Bachelor of Science in Agriculture majoring in Agronomy	Dr E van der Watt	32	50%	60%		
UGRD	B5480	54801	BC540015	520	Bachelor of Science in Agriculture majoring in Animal Sciences	Dr M Fair	32	50%	60%		
UGRD	B5480	54801	BC540036	520	Bachelor of Science in Agriculture majoring in Grassland Science	Dr M Fair	32	50%	60%		
UGRD	B5480	54801	BC540041	520	Bachelor of Science in Agriculture majoring in Plant Breeding	Prof. B Visser	32	50%	60%		
UGRD	B5480	54801	BC540042	520	Bachelor of Science in Agriculture majoring in Plant Pathology	Prof. B Visser	32	50%	60%		
UGRD	B5480	54801	BC540044	520	Bachelor of Science in Agriculture majoring in Soil Science	Dr E van der Watt	32	50%	60%		
UGRD	B5480	54801	BC540089	520	Bachelor of Science in Agriculture majoring in Wildlife Production	Dr M Fair	32	50%	60%		

POSTGRADUATE DIPLOMA PROGRAMMES

CAREER	PROG CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS
PGRD	B4550	45501	BC450025	120	Postgraduate Diploma in Disaster Management	Dr J Belle	Selection for PGDip
PGRD	B4551	45511	BC450091	120	Postgraduate Diploma in Integrated Water Management	Mrs M Avenant	Selection for PGDip
PGRD	B5547	55047	BC550047	136	Postgraduate Diploma in Sustainable Agriculture	Dr I van der Merwe	Selection for PGDip
BACHELOR HONOURS PROGRAMMES							
PGRD	B5600	56001	BC560011	120	Bachelor of Agriculture Honours majoring in Agricultural Economics	Dr J Henning	Selection for Honours Degree
PGRD	B5600	56001	BC560052	120	Bachelor of Agriculture Honours majoring in Agricultural Management	Dr J Henning	Selection for Honours Degree
PGRD	B5600	56001	BC560115	132	Bachelor of Agriculture Honours majoring in Animal Production	Dr M Fair	Selection for Honours Degree
PGRD	B5600	56001	BC560072	124	Bachelor of Agriculture Honours majoring in Irrigation Management	Dr E van der Watt	Selection for Honours Degree
PGRD	B5600	56001	BC560090	124	Bachelor of Agriculture Honours majoring in Wildlife Management	Dr M Fair	Selection for Honours Degree
PGRD	B4691	46901	BC460114	120	Bachelor of Architecture Honours	Mr K du Preez	Selection for Honours Degree
PGRD	B4661	46000	BC460156	120	Bachelor of Computer Information Systems Honours	Mr J Marais	Selection for Honours Degree
PGRD	B5680	56801	BC560012	128	Bachelor of Science Honours in Agriculture majoring in Agrometeorology	Dr E van der Watt	Selection for Honours Degree
PGRD	B5680	56801	BC560013	128	Bachelor of Science Honours in Agriculture majoring in Agronomy	Dr E van der Watt	Selection for Honours Degree

PGRD	B5680	56801	BC560015	128	Bachelor of Science Honours in Agriculture majoring in Animal Sciences	Dr M Fair	Selection for Honours Degree
PGRD	B5680	56801	BC560036	148	Bachelor of Science Honours in Agriculture majoring in Grassland	Dr M Fair	Selection for Honours Degree
PGRD	B5680	56801	BC560041	120	Bachelor of Science Honours in Agriculture majoring in Plant Breeding	Prof. B Visser	Selection for Honours Degree
PGRD	B5680	56801	BC560042	120	Bachelor of Science Honours in Agriculture majoring in Plant Pathology	Prof. B Visser	Selection for Honours Degree
PGRD	B5680	56801	BC560044	128	Bachelor of Science Honours in Agriculture majoring in Soil Science	Dr E van der Watt	Selection for Honours Degree
PGRD	B5680	56801	BC560089	120	Bachelor of Science Honours in Agriculture majoring in Wildlife Science	Dr M Fair	Selection for Honours Degree
PGRD	B4690	46911	BC460024	136	Bachelor of Science Honours in Construction Management	Mrs T Bremer	Selection for Honours Degree
PGRD	B4670	46701	BC460023	128	Bachelor of Science Honours in Consumer Science	Dr I. van der Merwe	Selection for Honours Degree
PGRD	B4690	46921	BC460043	128	Bachelor of Science Honours in Quantity Surveying	Mrs T Bremer	Selection for Honours Degree
PGRD	B4620	46001	BC460010	128/122	Bachelor of Science Honours majoring in Actuarial Science	Dr M von Maltitz	Selection for Honours Degree
PGRD	B4650	46001	BC460011	120	Bachelor of Science Honours majoring in Agricultural Economics	Dr J Henning	Selection for Honours Degree
PGRD	B4630	46001	BC460012	128	Bachelor of Science Honours majoring in Agrometeorology	Dr J Venter	Selection for Honours Degree
PGRD	B4620	46001	BC460046	122	Bachelor of Science Honours majoring in Applied Statistics	Dr M von Maltitz	Selection for Honours Degree
PGRD	B4630	46001	BC460017	128	Bachelor of Science Honours majoring in Astrophysics	Dr J Venter	Selection for Honours Degree
PGRD	B4610	46001	BC460018	120	Bachelor of Science Honours majoring in Behaviour Genetics	Mrs Z Murray	Selection for Honours Degree
PGRD	B4610	46001	BC460019	128	Bachelor of Science Honours majoring in Biochemistry	Dr F O'Neill	Selection for Honours Degree
PGRD	B4610	46001	BC460020	120	Bachelor of Science Honours majoring in Botany	Prof. B Visser	Selection for Honours Degree
PGRD	B4620	46001	BC460021	128	Bachelor of Science Honours majoring in Chemistry	Dr J Venter	Selection for Honours Degree
PGRD	B4660	46001	BC460022	120	Bachelor of Science Honours majoring in Computer Science and Informatics	Mr J Marais	Selection for Honours Degree
PGRD	B4660	46001	BC460095	120	Bachelor of Science Honours majoring in Data Science	Mr J Marais	Selection for Honours Degree
PGRD	B4610	46001	BC460027	120	Bachelor of Science Honours majoring in Entomology	Dr C Jansen van Rensburg	Selection for Honours Degree
PGRD	B4640	46001	BC460062	128	Bachelor of Science Honours majoring in Environment Sciences	Miss E Kruger	Selection for Honours Degree
PGRD	B4640	46001	BC460028	120	Bachelor of Science Honours majoring in Environmental Geology	Mrs J Magson	Selection for Honours Degree
PGRD	B4610	46001	BC460029	128	Bachelor of Science Honours majoring in Food Science	Dr F O'Neill/Prof. J Albertyn	Selection for Honours Degree
PGRD	B4610	46001	BC460067	120	Bachelor of Science Honours majoring in Forensic Genetics	Dr K Ehlers	Selection for Honours Degree
PGRD	B4610	46001	BC460065	128	Bachelor of Science Honours majoring in Forensic Chemistry	Dr K Ehlers	Selection for Honours Degree
PGRD	B4610	46001	BC460030	120	Bachelor of Science Honours majoring in Forensic Science	Dr K Ehlers	Selection for Honours Degree
PGRD	B4610	46001	BC460031	120	Bachelor of Science Honours majoring in Genetics	Mrs Z Murray	Selection for Honours Degree
PGRD	B4640	46001	BC460032	120	Bachelor of Science Honours majoring in Geochemistry	Mrs J Magson	Selection for Honours Degree
PGRD	B4640	46001	BC460033	128	Bachelor of Science Honours majoring in Geography	Miss E Kruger	Selection for Honours Degree
PGRD	B4640	46001	BC460034	252	Bachelor of Science Honours majoring in Geohydrology	Mrs A Allwright	Selection for Honours Degree
PGRD	B4640	46001	BC460069	128	Bachelor of Science Honours majoring in Geo-informatics	Miss E Kruger	Selection for Honours Degree
PGRD	B4640	46001	BC460035	120	Bachelor of Science Honours majoring in Geology	Mrs J Magson	Selection for Honours Degree
PGRD	B4610	46001	BC460076	120	Bachelor of Science Honours majoring in Limnology	Mrs M Avenant	Selection for Honours Degree
PGRD	B4620	46001	BC460037	122	Bachelor of Science Honours majoring in Mathematical Statistics	Dr M von Maltitz	Selection for Honours Degree
PGRD	B4620	46001	BC460038	120	Bachelor of Science Honours majoring in Mathematics and Applied Mathematics	Mr C Venter	Selection for Honours Degree
PGRD	B4610	46001	BC460039	128	Bachelor of Science Honours majoring in Microbiology	Prof. J Albertyn	Selection for Honours Degree
PGRD	B4630	46001	BC460040	160	Bachelor of Science Honours majoring in Physics	Dr J Venter	Selection for Honours Degree
PGRD	B4610	46001	BC560041	120	Bachelor of Science Honours majoring in Plant Breeding	Prof. B Visser	Selection for Honours Degree
PGRD	B4610	46001	BC460082	120	Bachelor of Science Honours majoring in Plant Health Ecology	Prof. B Visser	Selection for Honours Degree
PGRD	B4610	46001	BC560042	120	Bachelor of Science Honours majoring in Plant Pathology	Prof. B Visser	Selection for Honours Degree
PGRD	B4620	46001	BC460087	122	Bachelor of Science Honours majoring in Risk Analysis	Dr M von Maltitz	Selection for Honours Degree
PGRD	B4640	46001	BC460044	128	Bachelor of Science Honours majoring in Soil Science	Prof. van Wyk	Selection for Honours Degree
PGRD	B4610	46001	BC460049	120	Bachelor of Science Honours majoring in Zoology	Dr C Jansen van Rensburg	Selection for Honours Degree
PGRD	B4693	46931	BC460171	140	Bachelor of Spatial Planning Honours (specialising in Human Settlement)	Dr K. Mocwagae	Selection for Honours Degree
PGRD	B4693	46931	BC460145	140	Bachelor of Spatial Planning Honours	Dr K. Mocwagae	Selection for Honours Degree

MASTER PROGRAMMES

CAREER	PROG CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS
PGRD	B5800	58301	BC580111	180	Master of Agriculture majoring in Agricultural Economics	Dr J Henning	Selection for Master's Degree
PGRD	B5800	58301	BC580152	180	Master of Agriculture majoring in Agricultural Management	Dr J Henning	Selection for Master's Degree
PGRD	B5800	58301	BC580115	180	Master of Agriculture majoring in Animal Production Management	Dr M Fair	Selection for Master's Degree
PGRD	B5800	58301	BC580172	180	Master of Agriculture majoring in Irrigation Management	Dr E van der Watt	Selection for Master's Degree
PGRD	B5800	58301	BC580190	180	Master of Agriculture majoring in Wildlife Management	Dr M Fair	Selection for Master's Degree
PGRD	B4791	47901	BC470314	180	Master of Architecture (for professional registration)	Mr K du Preez	Selection for Master's Degree
PGRD	B4891	48011	BC480214	180	Master of Architecture (Research)	Mr K du Preez	Selection for Master's Degree
PGRD	B4891	48011	BC480314	180	Master of Architecture with specialisation in Design	Mr K du Preez	Selection for Master's Degree
PGRD	B4750	47501	BC470325	180	Master of Disaster Management	Dr J Belle	Selection for Master's Degree
PGRD	B4892	48021	BC480271	180	Master of Human Settlements	Dr K Mocwagae	Selection for Master's Degree
PGRD	B4792	47921	BC470393	180	Master of Land and Property Development Management with specialisation in Project Management	Mrs T Bremer	Selection for Master's Degree
PGRD	B4792	47921	BC470394	180	Master of Land and Property Development Management with specialisation in Property Studies	Mrs T Bremer	Selection for Master's Degree
PGRD	B5880	58001	BC580012	180	Master of Science in Agriculture majoring in Agrometeorology	Dr E van der Watt	Selection for Master's Degree
PGRD	B5880	58001	BC580053	180	Master of Science in Agriculture majoring in Agrometeorology Interdisciplinary	Dr E van der Watt	Selection for Master's Degree
PGRD	B5880	58001	BC580013	180	Master of Science in Agriculture majoring in Agronomy	Dr E van der Watt	Selection for Master's Degree
PGRD	B5880	58001	BC580054	180	Master of Science in Agriculture majoring in Agronomy Interdisciplinary	Dr E van der Watt	Selection for Master's Degree
PGRD	B5880	58001	BC580015	180	Master of Science in Agriculture majoring in Animal Science	Dr M Fair	Selection for Master's Degree
PGRD	B5880	58301	BC580029	180	Master of Science in Agriculture majoring in Food Science	Dr F O'Neill/Prof. J Albertyn	Selection for Master's Degree
PGRD	B5880	58301	BC580036	180	Master of Science in Agriculture majoring in Grassland Science	Dr M Fair	Selection for Master's Degree
PGRD	B5880	58001	BC580041	180	Master of Science in Agriculture majoring in Plant Breeding	Prof. B Visser	Selection for Master's Degree
PGRD	B5880	58001	BC580081	180	Master of Science in Agriculture majoring in Plant Breeding Interdisciplinary	Prof. B Visser	Selection for Master's Degree
PGRD	B5880	58001	BC580042	180	Master of Science in Agriculture majoring in Plant Pathology	Prof. B Visser	Selection for Master's Degree
PGRD	B5880	58001	BC580083	180	Master of Science in Agriculture majoring in Plant Pathology Interdisciplinary	Prof. B Visser	Selection for Master's Degree
PGRD	B5880	58001	BC580044	180	Master of Science in Agriculture majoring in Soil Science	Dr E van der Watt	Selection for Master's Degree
PGRD	B5880	58001	BC580088	180	Master of Science in Agriculture majoring in Soil Science Interdisciplinary	Dr E van der Watt	Selection for Master's Degree
PGRD	B5880	58001	BC580089	180	Master of Science in Agriculture majoring in Wildlife Science	Dr M Fair	Selection for Master's Degree
PGRD	B4820	48001	BC480010	180	Master of Science majoring in Actuarial Science	Dr M von Maltitz	Selection for Master's Degree
PGRD	B4850	48001	BC480011	180	Master of Science majoring in Agricultural Economics	Dr J Henning	Selection for Master's Degree
PGRD	B5840	48001	BC480012	180	Master of Science majoring in Agrometeorology	Dr E van der Watt	Selection for Master's Degree
PGRD	B4720	47201	BC470116	180	Master of Science majoring in Applied Mathematics	Mr C Venter	Selection for Master's Degree
PGRD	B4820	48001	BC480016	180	Master of Science majoring in Applied Mathematics	Mr C Venter	Selection for Master's Degree
PGRD	B4820	48001	BC480046	180	Master of Science majoring in Applied Statistics	Dr M von Maltitz	Selection for Master's Degree
PGRD	B4730	47001	BC470117	180	Master of Science majoring in Astrophysics	Dr J Venter	Selection for Master's Degree
PGRD	B4840	48001	BC480017	180	Master of Science majoring in Astrophysics	Dr J Venter	Selection for Master's Degree
PGRD	B4810	48001	BC480018	180	Master of Science majoring in Behavioural Genetics	Ms Z Murray	Selection for Master's Degree
PGRD	B4810	48001	BC480019	180	Master of Science majoring in Biochemistry	Dr F O'Neill	Selection for Master's degree
PGRD	B4810	48001	BC480020	180	Master of Science majoring in Botany	Prof. B Visser	Selection for Master's Degree
PGRD	B4830	48001	BC480021	180	Master of Science majoring in Chemistry	Dr J Venter	Selection for Master's Degree
PGRD	B4770	47001	BC480099	180	Master of Science majoring in Climate Change Structured	Mr J Marais	Selection for Master's Degree
PGRD	B4860	48001	BC480056	180	Master of Science majoring in Computer Information Systems	Mr J Marais	Selection for Master's Degree
PGRD	B4860	48001	BC480022	180	Master of Science majoring in Computer Science and Informatics	Mr J Marais	Selection for Master's Degree
PGRD	B4760	47001	BC470122	180	Master of Science majoring in Computer Science and Informatics	Mr J Marais	Selection for Master's Degree
PGRD	B4890	48001	BC480024	180	Master of Science majoring in Construction Management	Mr HB du Plessis	Selection for Master's Degree
PGRD	B4810	48001	BC480094	180	Master of Science majoring in Conservation Biology	Mrs Z Murray	Selection for Master's Degree
PGRD	B4770	47001	BC470123	180	Master of Science majoring in Consumer Science	Dr I van der Merwe	Selection for Master's Degree
PGRD	B4870	48001	BC480023	180	Master of Science majoring in Consumer Science	Dr I van der Merwe	Selection for Master's Degree

PGRD	B4860	48001	BC480095	180	Master of Science majoring in Data Science	Mr J Marais	Selection for Master's Degree
PGRD	B4810	48001	BC480027	180	Master of Science majoring in Entomology	Dr C Jansen van Rensburg	Selection for Master's Degree
PGRD	B4840	48001	BC480028	180	Master of Science majoring in Environmental Geology	Mrs J Magson	Selection for Master's Degree
PGRD	B4751	47001	BC470160	180	Master of Sciences majoring in Environmental Management	Mrs M Avenant	Selection for Master's Degree
PGRD	B4851	48001	BC480060	180	Master of Sciences majoring in Environmental Management	Mrs M Avenant	Selection for Master's Degree
PGRD	B4810	48001	BC480029	180	Master of Science majoring in Food Science	Dr F O'Neill/Prof. J Albertyn	Selection for Master's Degree
PGRD	B4810	48001	BC480065	180	Master of Science majoring in Forensic Chemistry	Dr K Ehlers	Selection for Master's Degree
PGRD	B4810	48001	BC480027	180	Master of Science majoring in Forensic Entomology	Dr K Ehlers	Selection for Master's Degree
PGRD	B4810	48001	BC480067	180	Master of Science majoring in Forensic Genetics	Dr K Ehlers	Selection for Master's Degree
PGRD	B4810	48001	BC480068	180	Master of Science majoring in Forensic Interdisciplinary	Dr K Ehlers	Selection for Master's Degree
PGRD	B4810	48001	BC480030	180	Master of Science majoring in Forensic Sciences	Dr K Ehlers	Selection for Master's Degree
PGRD	B4810	48001	BC480031	180	Master of Science majoring in Genetics	Mrs Z Murray	Selection for Master's Degree
PGRD	B4840	48001	BC480032	180	Master of Science majoring in Geochemistry	Mrs J Magson	Selection for Master's Degree
PGRD	B4840	48001	BC480033	180	Master of Science majoring in Geography	Miss E Kruger	Selection for Master's Degree
PGRD	B4840	48001	BC480034	180	Master of Science majoring in Geohydrology	Mrs A Allwright	Selection for Master's Degree
PGRD	B4840	48001	BC480069	180	Master of Science majoring in Geo-Informatics	Miss E Kruger	Selection for Master's Degree
PGRD	B4840	48001	BC480035	180	Master of Science majoring in Geology	Mrs J Magson	Selection for Master's Degree
PGRD	B4880	48001	BC480036	180	Master of Science majoring in Grassland Sciences	Dr M Fair	Selection for Master's Degree
PGRD	B4751	47001	BC470151	180	Master of Science majoring in Integrated Water Management	Mrs M Avenant	Selection for Master's Degree
PGRD	B4851	48001	BC480060	180	Master of Science majoring in Integrated Water Management	Mrs M Avenant	Selection for Master's Degree
PGRD	B4810	48001	BC480076	180	Master of Science majoring in Limnology	Mrs M Avenant	Selection for Master's Degree
PGRD	B4820	48001	BC480037	180	Master of Science majoring in Mathematical Statistics	Dr M von Maltitz	Selection for Master's Degree
PGRD	B4720	47201	BC470138	180	Master of Science majoring in Mathematics	Mr C Venter	Selection for Master's Degree
PGRD	B4820	48001	BC480038	180	Master of Science majoring in Mathematics	Mr C Venter	Selection for Master's Degree
PGRD	B4810	48001	BC480077	180	Master of Science majoring in Microbial Biotechnology	Prof. J Albertyn	Selection for Master's Degree
PGRD	B4810	48001	BC480039	180	Master of Science majoring in Microbiology	Prof. J Albertyn	Selection for Master's Degree
PGRD	B4740	47001	BC470178	204	Master of Science majoring in Mineral Resource Management	Mrs C van der Vyver	Selection for Master's Degree
PGRD	B4840	48001	BC480078	204	Master of Science majoring in Mineral Resource Management	Mrs C van der Vyver	Selection for Master's Degree
PGRD	B4830	48001	BC480040	180	Master of Science majoring in Physics	Dr J Venter	Selection for Master's Degree
PGRD	B4880	48001	BC480041	180	Master of Science majoring in Plant Breeding	Prof. B Visser	Selection for Master's Degree
PGRD	B4880	48001	BC480081	180	Master of Science majoring in Plant Breeding Interdisciplinary	Prof. B Visser	Selection for Master's Degree
PGRD	B4810	48001	BC480082	180	Master of Science majoring in Plant Health Ecology	Prof. B Visser	Selection for Master's Degree
PGRD	B4880	48001	BC480042	180	Master of Science majoring in Plant Pathology	Prof. B Visser	Selection for Master's Degree
PGRD	B4880	48001	BC480083	180	Master of Science majoring in Plant Pathology Interdisciplinary	Prof. B Visser	Selection for Master's Degree
PGRD	B4890	48001	BC480085	180	Master of Science majoring in Property Science	Mr HB du Plessis	Selection for Master's Degree
PGRD	B4890	48001	BC480043	180	Master of Science majoring in Quantity Surveying	Mr HB du Plessis	Selection for Master's Degree
PGRD	B4820	48001	BC480087	180	Master of Science majoring in Risk Analysis	Dr M von Maltitz	Selection for Master's Degree
PGRD	B4840	48001	BC480044	180	Master of Science majoring in Soil Sciences	Miss E Kruger	Selection for Master's Degree
PGRD	B4850	48001	BC480089	180	Master of Science majoring in Wildlife	Dr M Fair	Selection for Master's Degree
PGRD	B4810	48001	BC480049	180	Master of Science majoring in Zoology	Dr C Jansen van Rensburg	Selection for Master's Degree
PGRD	B4739	47301	BC470179	180	Master of Science in Nanoscience	Dr J Venter	Selection for Master's Degree
PGRD	B5781	57847	BC571347	180	Master of Sustainable Agriculture	Dr I van der Merwe	Selection for Master's Degree
PGRD	B4893	48901	BC480348	180	Master of Urban and Regional Planning (For professional registration)	Dr K Mocwagae	Selection for Master's Degree
PGRD	B4893	48901	BC470348	208	Master of Urban and Regional Planning (Research)	Dr K Mocwagae	Selection for Master's Degree

DOCTOR OF PHILOSOPHY PROGRAMMES

CAREER	PROG CODE	DEGREE CODE	ACADEMIC PLAN CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS
PGRD	B4920	49001	BC490010	360	Doctor of Philosophy majoring in Actuarial Science	Dr M von Maltitz	Selection for Doctorate Degree
PGRD	B4980	49001	BC490011	360	Doctor of Philosophy majoring in Agricultural Economics	Dr J Henning	Selection for Doctorate Degree

PGRD	B4900	49001	BC490052	360	Doctor of Philosophy majoring in Agricultural Management	Dr J Henning	Selection for Doctorate Degree
PGRD	B4980	49001	BC490012	360	Doctor of Philosophy majoring in Agrometeorology	Dr E van der Watt	Selection for Doctorate Degree
PGRD	B4980	49001	BC490053	360	Doctor of Philosophy majoring in Agrometeorology Interdisciplinary	Dr E van der Watt	Selection for Doctorate Degree
PGRD	B4980	49001	BC490013	360	Doctor of Philosophy majoring in Agronomy	Dr E van der Watt	Selection for Doctorate Degree
PGRD	B4980	49001	BC490054	360	Doctor of Philosophy majoring in Agronomy Interdisciplinary	Dr E van der Watt	Selection for Doctorate Degree
PGRD	B4900	49001	BC490090	360	Doctor of Philosophy majoring in Animal Production Management	Dr M Fair	Selection for Doctorate Degree
PGRD	B4980	49001	BC490015	360	Doctor of Philosophy majoring in Animal Sciences	Dr M Fair	Selection for Doctorate Degree
PGRD	B4920	49001	BC490016	360	Doctor of Philosophy majoring in Applied Mathematics	Mr C Venter	Selection for Doctorate Degree
PGRD	B4920	49001	BC490046	360	Doctor of Philosophy majoring in Applied Statistics	Dr M von Maltitz	Selection for Doctorate Degree
PGRD	B4990	49091	BC490014	360	Doctor of Philosophy majoring in Architecture	Mr K du Preez	Selection for Doctorate Degree
PGRD	B4990	49091	BC490114	360	Doctor of Philosophy majoring in Architecture with Design	Mr K du Preez	Selection for Doctorate Degree
PGRD	B4930	49001	BC490017	360	Doctor of Philosophy majoring in Astrophysics	Dr J Venter	Selection for Doctorate Degree
PGRD	B4910	49001	BC490018	360	Doctor of Philosophy majoring in Behavioural Genetics	Ms Z Murray	Selection for Doctorate Degree
PGRD	B4910	49001	BC490019	360	Doctor of Philosophy majoring in Biochemistry	Dr F O'Neill	Selection for Doctorate Degree
PGRD	B4910	49001	BC490020	360	Doctor of Philosophy majoring in Botany	Prof. B Visser	Selection for Doctorate Degree
PGRD	B4930	49001	BC490021	360	Doctor of Philosophy majoring in Chemistry	Dr J Venter	Selection for Doctorate Degree
PGRD	B4960	49001	BC490056	360	Doctor of Philosophy majoring in Computer Information Systems	Mr J Marais	Selection for Doctorate Degree
PGRD	B4960	49001	BC490022	360	Doctor of Philosophy majoring in Computer Science and Informatics	Mr J Marais	Selection for Doctorate Degree
PGRD	B4910	49001	BC480094	360	Doctor of Philosophy majoring in Conservation Biology	Mrs Z Murray	Selection for Doctorate Degree
PGRD	B4990	49001	BC490024	360	Doctor of Philosophy majoring in Construction Management	Mr HB du Plessis	Selection for Doctorate Degree
PGRD	B4970	49001	BC490023	360	Doctor of Philosophy majoring in Consumer Sciences	Dr I van der Merwe	Selection for Doctorate Degree
PGRD	B4960	49001	BC490095	360	Doctor of Philosophy majoring in Data Science	Mr J Marais	Selection for Doctorate Degree
PGRD	B4950	49001	BC490025	360	Doctor of Philosophy majoring in Disaster Management	Dr J Belle	Selection for Doctorate Degree
PGRD	B4910	49001	BC490027	360	Doctor of Philosophy majoring in Entomology	Dr C Jansen van Rensburg	Selection for Doctorate Degree
PGRD	B4940	49001	BC490028	360	Doctor of Philosophy majoring in Environmental Geology	Mrs J Magson	Selection for Doctorate Degree
PGRD	B4950	49001	BC490060	360	Doctor of Philosophy majoring in Environmental Management	Mrs M F Avenant	Selection for Doctorate Degree
PGRD	B4980	49001	BC490029	360	Doctor of Philosophy majoring in Food Science	Dr F O'Neill/Prof. J Albertyn	Selection for Doctorate Degree
PGRD	B4910	49001	BC490065	360	Doctor of Philosophy majoring in Forensic Chemistry	Dr K Ehlers	Selection for Doctorate Degree
PGRD	B4910	49001	BC490066	360	Doctor of Philosophy majoring in Forensic Entomology	Dr K Ehlers	Selection for Doctorate Degree
PGRD	B4910	49001	BC490067	360	Doctor of Philosophy majoring in Forensic Genetics	Dr K Ehlers	Selection for Doctorate Degree
PGRD	B4910	49001	BC490068	360	Doctor of Philosophy majoring in Forensic Interdisciplinary	Dr K Ehlers	Selection for Doctorate Degree
PGRD	B4910	49001	BC490030	360	Doctor of Philosophy majoring in Forensic Science	Dr K Ehlers	Selection for Doctorate Degree
PGRD	B4910	49001	BC490031	360	Doctor of Philosophy majoring in Genetics	Mrs Z Murray	Selection for Doctorate Degree
PGRD	B4940	49001	BC490032	360	Doctor of Philosophy majoring in Geochemistry	Mrs J Magson	Selection for Doctorate Degree
PGRD	B4940	49001	BC490033	360	Doctor of Philosophy majoring in Geography	Miss E Kruger	Selection for Doctorate Degree
PGRD	B4940	49001	BC490034	360	Doctor of Philosophy majoring in Geohydrology	Ms A Allwright	Selection for Doctorate Degree
PGRD	B4940	49001	BC490069	360	Doctor of Philosophy majoring in Geo-Informatics	Miss E Kruger	Selection for Doctorate Degree
PGRD	B4940	49001	BC490035	360	Doctor of Philosophy majoring in Geology	Mrs J Magson	Selection for Doctorate Degree
PGRD	B4980	49001	BC490036	360	Doctor of Philosophy majoring in Grassland Science	Dr M Fair	Selection for Doctorate Degree
PGRD	B4990	49001	BC490071	360	Doctor of Philosophy majoring in Human Settlements	Mr HB du Plessis	Selection for Doctorate Degree
PGRD	B4950	49001	BC490051	360	Doctor of Philosophy majoring in Integrated water management	Mrs M F Avenant	Selection for Doctorate Degree
PGRD	B4900	49001	BC490072	360	Doctor of Philosophy majoring in Irrigation Management	Dr E van der Watt	Selection for Doctorate Degree
PGRD	B4910	49001	BC490076	360	Doctor of Philosophy majoring in Limnology	Mrs M Avenant	Selection for Doctorate Degree
PGRD	B4920	49001	BC490037	360	Doctor of Philosophy majoring in Mathematical Statistics	Dr M von Maltitz	Selection for Doctorate Degree
PGRD	B4920	49001	BC490038	360	Doctor of Philosophy majoring in Mathematics	Mr C Venter	Selection for Doctorate Degree
PGRD	B4910	49001	BC490077	360	Doctor of Philosophy majoring in Microbial Biotechnology	Prof. J Albertyn	Selection for Doctorate Degree
PGRD	B4910	49001	BC490039	360	Doctor of Philosophy majoring in Microbiology	Prof. J Albertyn	Selection for Doctorate Degree
PGRD	B4940	49001	BC490078	360	Doctor of Philosophy majoring in Mineral Resource Management	Charlene van der Vyver	Selection for Doctorate Degree
PGRD	B4930	49001	BC490079	360	Doctor of Philosophy majoring in Nanoscience	Dr J Venter	Selection for Doctorate Degree
PGRD	B4930	49001	BC490040	360	Doctor of Philosophy majoring in Physics	Dr J Venter	Selection for Doctorate Degree

PGRD	B4980	49001	BC490041	360	Doctor of Philosophy majoring in Plant Breeding	Prof. B Visser	Selection for Doctorate Degree
PGRD	B4980	49001	BC490081	360	Doctor of Philosophy majoring in Plant Breeding Interdisciplinary	Prof. B Visser	Selection for Doctorate Degree
PGRD	B4910	49001	BC490082	360	Doctor of Philosophy majoring in Plant Health Ecology	Prof. B Visser	Selection for Doctorate Degree
PGRD	B4980	49001	BC490042	360	Doctor of Philosophy majoring in Plant Pathology	Prof. B Visser	Selection for Doctorate Degree
PGRD	B4980	49001	BC490083	360	Doctor of Philosophy majoring in Plant Pathology Interdisciplinary	Prof. B Visser	Selection for Doctorate Degree
PGRD	B4990	49001	BC490085	360	Doctor of Philosophy majoring in Property Science	Mr HB du Plessis	Selection for Doctorate Degree
PGRD	B4990	49001	BC490043	360	Doctor of Philosophy majoring in Quantity Surveying	Mr HB du Plessis	Selection for Doctorate Degree
PGRD	B4920	49001	BC490087	360	Doctor of Philosophy majoring in Risk Analysis	Dr M von Maltitz	Selection for Doctorate Degree
PGRD	B4980	49001	BC490088	360	Doctor of Philosophy majoring in Soil Science Interdisciplinary	Dr E van der Watt	Selection for Doctorate Degree
PGRD	B4980	49001	BC490044	360	Doctor of Philosophy majoring in Soil Sciences	Dr E van der Watt	Selection for Doctorate Degree
PGRD	B4980	49001	BC490047	360	Doctor of Philosophy majoring in Sustainable Agriculture	Dr I van der Merwe	Selection for Doctorate Degree
PGRD	B4990	49001	BC490048	360	Doctor of Philosophy majoring in Urban and Regional Planning	Mr S. Denoon-Stevens	Selection for Doctorate Degree
PGRD	B4980	49001	BC490089	360	Doctor of Philosophy majoring in Wildlife	Dr M Fair	Selection for Doctorate Degree
PGRD	B4900	49001	BC490090	360	Doctor of Philosophy majoring in Wildlife Management	Dr M Fair	Selection for Doctorate Degree
PGRD	B4910	49001	BC490049	360	Doctor of Philosophy majoring in Zoology	Dr C Jansen van Rensburg	Selection for Doctorate Degree

QWAQWA CAMPUS

UNDERGRADUATE PROGRAMMES (QWAQWA CAMPUS)

EXTENDED PROGRAMMES (QWAQWA CAMPUS)

CAREER	PROG CODE	DEGREE CODE	ACADEMIC CODE	TOTAL CREDITS	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS				
							AP	NSC % IN TUITION LANGUAGE	NSC LEVEL MATHS	NSC LEVEL PHYSICAL SCIENCE	NSC LEVEL LIFE SCIENCE
UGRD	Q43E2	43001	QC4300E1		Bachelor of Science Extended Degree Mathematics, Chemistry and Biology	Mrs L Koenig	22	40%	40%	40% OR	40%
UGRD	Q43E1	43610	QC4301E1		Bachelor of Science Extended Degree Computer Sciences and Information Technology	Mrs L Koenig	22	40%	40%	40% OR	40%
UGRD	Q43E2	43001	QC4300E2		Bachelor of Science Extended Degree Mathematics, Geography and Biology	Mrs L Koenig	22	40%	40%	40% OR	40%

BACHELOR DEGREES (QWAQWA CAMPUS)

UGRD	Q4310	43001	QC432075		Bachelor of Science majoring in Botany and Life Sciences	Dr Tom Okello	32	50%	60%	60%	60%
UGRD	Q4310	43001	QC434975		Bachelor of Science majoring in Zoology and Life Sciences	Dr Tom Okello	32	50%	60%	60%	60%
UGRD	Q4310	43001	QC437500		Bachelor of Science majoring in Life Sciences	Dr Tom Okello	32	50%	60%	60%	60%
UGRD	Q4320	43001	QC433821		Bachelor of Science majoring in Mathematics and Chemistry	Mr Teboho Lesesa	32	50%	70%	60%	60%
UGRD	Q4320	43001	QC433840		Bachelor of Science majoring in Mathematics and Physics	Mr Teboho Lesesa	32	50%	70%	60%	60%
UGRD	Q4320	43001	QC433822		Bachelor of Science majoring in Mathematics and Computer Science	Mr Teboho Lesesa	32	50%	70%	NA	NA
UGRD	Q4330	43001	QC432120		Bachelor of Science majoring in Chemistry and Botany	Dr Richard Ocaya	32	50%	60%	60%	60%
UGRD	Q4330	43001	QC432140		Bachelor of Science majoring in Chemistry and Physics	Dr Richard Ocaya	32	50%	60%	60%	NA
UGRD	Q4340	43001	QC433359		Bachelor of Science majoring in Geography and Environmental Geography	Dr Tom Okello	32	50%	60%	60%	60%
UGRD	Q4340	43001	QC433392		Bachelor of Science majoring in Geography and Tourism	Dr Tom Okello	32	50%	60%	NA	NA
UGRD	Q4340	43001	QC433375		Bachelor of Science majoring in Geography and Life Science	Dr Tom Okello	32	50%	60%	60%	60%
UGRD	Q4360	43601	QC432221		Bachelor of Science in Information Technology majoring in Computer Science and Chemistry	Mr Teboho Lesesa	32	50%	60%	60%	
UGRD	Q4360	43601	QC432240		Bachelor of Science in Information Technology majoring in Computer Science and Physics	Mr Teboho Lesesa	32	50%	60%	60%	
UGRD	Q4360	43601	QC432202		Bachelor of Science in Information Technology majoring in Computer Science and Management	Mr Teboho Lesesa	32	50%	50%	50%	NA

POSTGRADUATE PROGRAMMES (QWAQWA CAMPUS)

BACHELOR OF HONOURS DEGREES (QWAQWA CAMPUS)

CAREER	PROGRAMME CODE	DEGREE CODE	ACADEMIC CODE	ENGLISH TITLE	PROGRAMME DIRECTOR	REQUIREMENTS
PGRD	Q4610	46001	QC460020	Bachelor of Science Honours majoring in Botany	Dr Tom Okello	Average of 60% for Botany on NQF-level 7. Selections for a BScHons programme.
PGRD	Q4610	46001	QC460049	Bachelor of Science Honours majoring in Zoology	Dr Tom Okello	Average of 60% for Zoology on NQF-level 7.Selections for a BScHons programme.
PGRD	Q4630	46001	QC460040	Bachelor of Science Honours majoring in Physics	Dr Richard Ocaya	Average of 60% for Physics on NQF-level 7.Selections for a BScHons programme.
PGRD	Q4630	46001	QC460084	Bachelor of Science Honours majoring in Polymer Science	Dr Richard Ocaya	Average of 60% for Chemistry on NQF-level 7.Selections for a BScHons programme.
PGRD	Q4640	46001	QC460033	Bachelor of Science Honours majoring in Environmental Geography	Dr Tom Okello	Average of 60% for Geograhpy on NQF-level 7.Selections for a BScHons programme.
PGRD	Q4660	46001	QC460022	Bachelor of Science Honours majoring in Computer Science and Informatics	Mr Teboho Lesesa	Average of 60% for Computer Science on NQF-level 7.Selections for a BScHons programme.
MASTER'S DEGREES (QWAQWA CAMPUS)						
PGRD	Q4810	48001	QC480020	Master of Science majoring in Botany	Dr Tom Okello	Selection for a Master in Science degree
PGRD	Q4810	48001	QC480049	Master of Science majoring in Zoology	Dr Tom Okello	Selection for a Master in Science degree
PGRD	Q4830	48001	QC480084	Master of Science majoring in Polymer Sciences	Dr Richard Ocaya	Selection for a Master in Science degree
PGRD	Q4830	48001	QC480021	Master of Science majoring in Chemistry	Dr Richard Ocaya	Selection for a Master in Science degree
PGRD	Q4830	48001	QC480040	Master of Science majoring in Physics	Dr Richard Ocaya	Selection for a Master in Science degree
PGRD	Q4840	48001	QC480059	Master of Science majoring in Environmental Geography	Dr Tom Okello	Selection for a Master in Science degree
PGRD	Q4840	48001	QC480033	Master of Science majoring in Geography	Dr Tom Okello	Selection for a Master in Science degree
PGRD	Q4860	48001	QC480022	Master of Science majoring in Computer Science and Informatics	Mr Teboho Lesesa	Selection for a Master in Science degree
DOCTORATE DEGREES (QWAQWA CAMPUS)						
PGRD	Q4910	49001	QC490020	Doctor of Philosophy majoring in Botany	Dr Tom Okello	Selection for PhD degree
PGRD	Q4910	49001	QC490049	Doctor of Philosophy majoring in Zoology	Dr Tom Okello	Selection for PhD degree
PGRD	Q4920	49001	QC490038	Doctor of Philosophy majoring in Mathematics	Mr Teboho Lesesa	Selection for PhD degree
PGRD	Q4930	49001	QC490040	Doctor of Philosophy majoring in Physics	Dr Richard Ocaya	Selection for PhD degree
PGRD	Q4930	49001	QC490084	Doctor of Philosophy majoring in Polymer	Dr Richard Ocaya	Selection for PhD degree
PGRD	Q4960	49001	QC490022	Doctor of Philosophy majoring in Computer Science and Informatics	Mr Teboho Lesesa	Selection for PhD degree

12. LEARNING PROGRAMMES & MODULES REQUIRED

12.1 LEARNING PROGRAMMES FOR EXTENDED PROGRAMMES

Candidates who do not comply with the Faculty of Natural and Agricultural Sciences entry requirements for main stream BSc studies can gain admission to the university through the University Preparation Programme (UPP) or the BSc Extended programmes. The programmes provide students with an opportunity to improve their skills and competencies with aim of gaining access to mainstream studies after successful completion of the first year. These Programmes also address, through a course in Skills and Competencies in Lifelong Learning, the student's wider needs with regards to quality of personal life, study and reading skills, self-assertiveness, problem solving, and other generic competencies. These students also attend an academic language course in English to improve their reading and writing skills for higher education purposes. Students are not allow to register for UFSS1504 in the first year of study.

NO STUDENT WILL BE ALLOWED TO REPEAT IN THESE PROGRAMMES.

12.1.2 BSc FOUR–YEAR EXTENDED PROGRAMME QC4300E1 (CHEMISTRY, MATHEMATICS)

		Semester 1	Semester 2
1	Mathematics Chemistry Biology	MATD1554 CHEM1552 + CHEM1551 BIOL1504	MATD1564 CHEM1622
	Academic language course Computer Literacy Life-long Learning – Natural Sciences	EALN1508 CSIQ1531 SCNS1508	
	After successful completion of ALL THE MODULES in the first year of the BSc Four-year Curriculum (Extended Programme) with an average of 60 % for Academic modules, the student changes to the first year main fields of interest modules of the learning programme of his/her choice as set out in the Faculty's Yearbook. Students must take note of the following requirements: • Students must pass academic modules in the June examination to continue their studies in the second semester. Students failing MATD1554 would not be allow to continue in the second semester • To register for CHEM1622 students must have passed CHEM1552 and CHEM1532 • To register for CHEM1632 and CHEM1562 students must have passed CHEM1622 and MATD1564 • To register for MATD1564 students must have passed MATD1554. To register for BIO 1644 and BIOL1624 students must have passed BIOL1504. Students who could not complete the first two years of study in three years will not be allowed for re-registration to the Faculty of Natural and Agricultural Sciences.		
2	**In their second year of study students have to register for CHEM1632, CHEM1562, and CSIQ1541 as well as all the first year main fields of interest modules in the learning programme of choice as set out in the Faculty Yearbook. Students must take note of the following requirements:** • To register for CHEM1632 and CHEM1562 students must have passed CHEM1622 as well as MATD1564 . • To register for CHEM1661, students must have passed CHEM1551. • The modules CHEM1552, CHEM1622, CHEM1632, CHEM1562, CHEM1551 and CHEM1661 must be passed to get recognition for CHEM1513 + CHEM1551 and CHEM1623/CHEM1661 (See BSc main fields of interest learning programmes).		
3	**Follow <u>second year</u> learning programme of choice in the Faculty Yearbook.** Students must take note of the following requirement: • Students must have passed CHEM1551, CHEM1661 and CSIQ1541 to be allowed to change to the programme code of current study.		
4	**Follow the <u>third year</u> Learning Programme of choice as set out in the Faculty Yearbook.**		

12.1.3 BSc FOUR-YEAR EXTENDED PROGRAMME QC4301E1 (COMPUTER SCIENCE AND MATHEMATICS)

YEAR			Semester 1	Semester 2
1	**Academic Modules**	Mathematics Information Technology	MATD1554 CSIQ1533 + CSIQ1553	MATD1564 CSIQ1623 + CSIQ1681 EBCS1524
	Development Modules	Academic language course Computer Literacy Life-long Learning – Natural Sciences	EALN1508 CSIQ1512 SCNS1508	
	After successful completion of ALL THE MODULES in the first year of the BSc Four-year Curriculum (Extended Programme) with an average of 60 % for Academic modules, the student changes to the first year main fields of interest modules of the learning programme of his/her choice as set out in the Faculty's Yearbook. Students must take note of the following requirements: • Students must pass at least two academic modules in the June examination to continue their studies in the second semester.Students failing MATD1554 would not be allowed to continue in the second semester. • To register for CSIQ1623 students must have passed CSIQ1553 and MATD1554 or level 4 for NCS Mathematics. • To register for MATD1564 students must have passed MATD1554. Students who could not complete the first two years of study in three years will not be allowed for reregistration to the Faculty of Natural and Agricultural Sciences.			
2	**In their second year of study students have to register for CSIQ1624 as well as all the first year main fields of interest modules in the learning programme of choice as set out in the Faculty Yearbook. Students must take note of the following requirements:** • To register for CSIQ1624 students must have passed CSIQ1512, CSIQ1533 as well as MATD1564. • To get recognition for CSIQ1531 + CSIQ1541 students must have passed CSIQ1512			
3	**Follow <u>second year</u> learning programme of choice in the Faculty Yearbook.** Students must take note of the following requirement: • Students must have passed CSIQ1623, CSIQ1624 and CSIQ1512 to be allowed to change to the programme code of current study.			
4	**Follow the <u>third year</u> learning programme of choice as set out in the Faculty Yearbook.**			

12.1.4 BSc FOUR-YEAR EXTENDED PROGRAMME QC4300E2 (BIOLOGY AND GEOGRAPHY)

		Semester 1	Semester 2
1	Mathematics Geography Biology	MATD1554 GEOE1514 BIOL1504	MATD1564 GEOE1624
	Academic language course Computer Literacy Life-long Learning – Natural Sciences	EALN1508 CSIQ1531 SCNS1508	
	After successful completion of ALL THE MODULES in the first year of the BSc Four-year Curriculum (Extended Programme) with an average of 60 % for Academic modules, the student changes to the first year main fields of interest modules of the learning programme of his/her choice as set out in the Faculty's Yearbook. Students must take note of the following requirements: • Students must pass at least two academic modules in the June examination to continue their studies in the second semester. Students failing MATD1554 would not be allowed to continue in the second semester • To register for GEOE1624 students must have passed GEOE1514 • To register for MATD1564 students must have passed MATD1554.To register for BIOL1624 students must have passed BIOL1504. Students who could not complete the first two years of study in three years will not be allowed for re-registration to the Faculty of Natural and Agricultural Sciences.		
2	**In their second year of study students have to register for CSIQ1541 as well as all the first year main fields of interest modules in the learning programme of choice as set out in the Faculty Yearbook.**		
3	**Follow <u>second year</u> learning programme of choice in the Faculty Yearbook.**		
4	**Follow the <u>third year</u> Learning Programme of choice as set out in the Faculty Yearbook.**		

12.2 LEARNING PROGRAMMES FOR BACHELOR DEGREES

12.2.1 BACHELOR OF SCIENCE IN THE BIOLOGICAL SCIENCES

LEARNING PROGRAMMES BIOLOGICAL SCIENCES FIELDS OF INTEREST 1

Learning programmes in the BIOLOGICAL FIELD OF INTEREST offer FOUR OPTIONS. Learning programmes consist of the combination of modules from the following disciplines: Botany, Zoology and Life Sciences. A combination of Life Sciences and all third year modules from either Botany, Entomology or Zoology as the other major. Students include all the compulsory modules in row (C1, C2, C3) of each of the selected disciplines for all three study years. Students need to SELECT enough elective modules per semester to obtain at least a total of 120 credits for

DISCIPLINE	**BOTANY & LIFE SCIENCES**	**ZOOLOGY & LIFE SCIENCES**	**LIFE SCIENCES**	**BOTANY & LIFE SCIENCES**	**ZOOLOGY & LIFE SCIENCES**	**LIFE SCIENCES**
	QC432075	**QC434975**	**QC437500**	**QC432075**	**QC434975**	**QC437500**
YEAR	**FIRST**			**FIRST**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C1	BIOL1514 CHEM1551 + CHEM1513 MATM1534	BIOL1514 CHEM1551 + CHEM1513 MATM1534	BIOL1514 CHEM1551 + CHEM1513 MATM1534	BIOL1624 BIOL1644 CHEM1623 + CHEM1661	BIOL1624 BIOL1644 CHEM1623 + CHEM1661	BIOL1624 BIOL1644 CHEM1623 + CHEM1661
ELECTIVES E1	PHYS1534 GEOG1514 EBCS1514	PHYS1534 GEOG1514 EBCS1514	PHYS1534 GEOG1514 EBCS1514	PHYS1644 GEOG1624 MATM1644 EBCS1524	PHYS1644 GEOG1624 MATM1644 EBCS1524	PHYS1644 GEOG1624 MATM1644 EBCS1524
REQUIRED *if NBT < 65%	CSIQ1531 UFSS1504 *EALN1508	CSIQ1531 UFSS1504 *EALN1508	CSIQ1531 UFSS1504 *EALN1508	CSIQ1541	CSIQ1541	CSIQ1541
YEAR	**SECOND**			**SECOND**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C2	BIOL2614 BOTA2654 BIOL2674	BIOL2614 ZOOL2634 BIOL2674 ZOOL2614	BIOL2614 BIOL2674 GISS2614 GISS2614	BOTA2684 BIOL2644	BIOL2644 ZOOL2664 ZOOL2684	BIOL2644 BOTA2684 GISS2684 ZOOL2684 **OR** ZOOL2664
ELECTIVES E2	**ONE OF:** ZOOL2634 ZOOL2614 GISS2614		**ONE OF:** ZOOL2614 ZOOL2634 BOTA2654	**TWO OF:** GISS2624 ZOOL2664 ZOOL2684	**ONE OF:** BOTA2684 GISS2624	**TWO OF:** GISS2624 ZOOL2664 ZOOL2684
YEAR	**THIRD**			**THIRD**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C3	BIOL3714 BOTA3734 BOTA3754	BIOL3714 ZOOL3714 BOTA3754 ZOOL3734	BIOL3714 ZOOL3714 GISS3714	BIOL3724 BOTA3724 BOTA3744	ZOOL3744 ZOOL3724 BIOL3724 ZOOL3764	BIOL3724 ZOOL3764 BOTA3744 GISS3724
ELECTIVES E3	**ONE OF:** ZOOL3714 ZOOL3734		BOTA3734 ZOOL3734	**ONE OF:** GISS3724 ZOOL3744 ZOOL3724 ZOOL3764		

12.2.2 BACHELOR OF SCIENCE IN THE CHEMICAL AND PHYSICAL SCIENCES

LEARNING PROGRAMMES PHYSICAL AND CHEMICAL SCIENCES FIELDS OF INTEREST 1

Learning programmes in Chemical and Physical sciences offer TWO main options with either

- Physic and Chemistry as the two majors or
- Chemistry in combination Biological Subjects as the other majors.

Each student Includes all the compulsory modules (row C) for all three study years enough electives modules (row E) per semester to obtain at least 120 credits per year in the first year and the second year.

DISCIPLINE	**PHYSICS & CHEMISTRY**	**CHEMISTRY & BOTANY**	**PHYSICS & CHEMISTRY**	**CHEMISTRY & BOTANY**
	QC432140	**QC432120**	**QC432140**	**QC432120**
YEAR	**FIRST**		**FIRST**	
SEMESTER	**FIRST**		**SECOND**	
COMPULSORY C1	PHYS1514/PHYS1534 CHEM1551 + CHEM1513	CHEM1551 + CHEM1513 BIOL1514	PHYS1624/PHYS1644 CHEM1623 + CHEM1661	CHEM1661 + CHEM1623 BIOL1644 BIOL1624
	MATM1534	MATM1534	MATM1644	MATM1644
ELECTIVES E1	GEOG1514 BIOL1514	PHYS1514/PHYS1534 GEOG1514 CSIQ1614 CSIQ1553	CSIQ1623 CSIQ1624 MATM1622	MATM1622
REQUIRED ***if NBT < 65%**	CSIQ1531 UFSS1504 *EALN1508		CSIQ1541	
YEAR	**SECOND**		**SECOND**	
SEMESTER	**FIRST**		**SECOND**	
COMPULSORY C2	PHYS2614 PHYS2632 CHEM2633 + CHEM2631 CHEM2613 + CHEM2611 MATA2654	CHEM2633 + CHEM2631 CHEM2613 + CHEM2611 BOTA2654	PHYS2624 PHYS2642 CHEM2643 + CHEM2641 CHEM2623 + CHEM2621	CHEM2643 + CHEM2641 CHEM2623 + CHEM2621 BIOL2644 BOTA2684
ELECTIVES E2	MATM2614 CSIQ2614	MATA2654 **ONE OF:** MATM2614 BIOL2614 BIOL2674	MATM2624 MATM2664	MATM2624 MATM2664
YEAR	**THIRD**		**THIRD**	
SEMESTER	**FIRST**		**SECOND**	
COMPULSORY C3	PHYS3714 PHYS3732 PHYS3752 CHEM3711 + CHEM3713 CHEM3731 + CHEM3733	CHEM3711 + CHEM3713 CHEM3731 + CHEM3733 BOTA3734 + BOTA3754	PHYS3724 PHYS3742 PHYS3762 CHEM3721 + CHEM3723 CHEM3741 + CHEM3743	CHEM3721 + CHEM3723 CHEM3741 + CHEM3743 BOTA3744 + BOTA3724
ELECTIVES E3				

PLEASE NOTE: (CHEM1562 + CHEM1552 + CHEM1622 + CHEM1632 + CHEM1551 + CHEM1661) extended = (CHEM1513 + CHEM1623 + CHEM1551 + CHEM1661) mainstream.
Admission to second and third-year chemistry is subject to a selection process as only the 70 best students can be accommodated

12.2.3 LEARNING PROGRAMMES IN THE INFORMATION TECHNOLOGY STREAM

LEARNING PROGRAMMES IN INFORMATION TECHNOLOGY BSc(IT)

Learning programmes in Information Technology offer THREE main options with either

- Information Technology and Chemistry as the majors
- Information Technology and Physics as the majors
- Information Technology and Business subjects as the majors

Students include all the compulsory modules in row C1 and C2 of each discipline for all three study years. They need to SELECT enough elective modules per semester to obtain at least 120 credits per year in the first year and the second year.

DISCIPLINE	INFORMATION TECHNOLOGY & CHEMISTRY	INFORMATION TECHNOLOGY & PHYSICS	INFORMATION TECHNOLOGY & MANAGEMENT	INFORMATION TECHNOLOGY & CHEMISTRY	INFORMATION TECHNOLOGY & PHYSICS	INFORMATION TECHNOLOGY & MANAGEMENT
EXT CODE	QC432221	QC432240	QC432202	QC432221	QC432240	QC432202
YEAR	**FIRST**			**FIRST**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C1	CSIQ1614 CSIQ1553 CHEM1551 + CHEM1513 MATM1534	CSIQ1614 CSIQ1553 PHYS1514/PHYS1534 MATM1534	CSIQ1614 CSIQ1553 EBUS1514	CSIQ1623 CSIQ1624 CHEM1661 + CHEM1623 MATM1644	CSIQ1623 CSIQ1624 PHYS1624/PHYS1644 MATM1644	CSIQ1623 CSIQ1624 **ONE OF:** EIOP1524 EBUS1624
COMPULSORY C2			**ONE OF:** EBCS1514 MATM1534			**ONE OF:** EBCS1524 MATM1644
ELECTIVES	EBCS1514	EBCS1514		EBCS1524	EBCS1524	
REQUIRED ***if NBT < 65%**	UFSS1504 EALN1508 CSIQ1512	UFSS1504 EALN1508 CSIQ1512	UFSS1504 EALN1508 CSIQ1512			
YEAR	**SECOND**			**SECOND**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C1	CSIQ2634 CSIQ2614 CSIQ2654 CHEM2613 + CHEM2611 CHEM2633 + CHEM2631	CSIQ2634 CSIQ2654 CSIQ2614 PHYS2614 PHYS2632	CSIQ2634 CSIQ2654 CSIQ2614 EBUS1614	CSIQ2644 CSIQ2624 CHEM2623 + CHEM2621 CHEM2643 + CHEM2641	CSIQ2644 CSIQ2624 PHYS2624 PHYS2642	CSIQ2644 CSIQ2624 EBMA2624
C2			**ONE OF:** ECAP2614 EECF1614			**ONE OF:** ELRM2624 EECF1624
ELECTIVE				CSIQ2642	CSIQ2642	CSIQ2642
YEAR	**THIRD**			**THIRD**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C1	CSIQ3734 CSIQ3714 CHEM3713 + CHEM3711 CHEM3733 + CHEM3731	CSIQ3734 CSIQ3714 PHYS3714 PHYS3732 PHYS3752	CSIQ3734 CSIQ3714 EBUS2714 EORG3715	CSIQ3724 CSIQ3784 CHEM3723 + CHEM3721 CHEM3743 + CHEM3741	CSIQ3724 CSIQ3784 PHYS3724 PHYS3742 PHYS3762	CSIQ3724 CSIQ3784 ESBM2724 EPFM3724

12.2.4 BACHELOR OF SCIENCE IN GEOSCIENCES

The learning programmes in **GEOGRAPHICAL FIELD OF INTEREST** offer **THREE OPTIONS**, Environmental Geography, Geography and Life Science and Tourism Geography. This programme include the studiy of the properties and processes in the earth and on the surface and encompass a holistic study of the human environment and accompanying interactions and relationships. The programme is aimed at students who are interested in various aspects of the environment and can lead to specialisation as environmentalists. Careers in these sciences are divergent because all institutions that are involved with resource utilisation are legally obliged to examine the impact of their activities on the environment. The connection of geographical information and computer technology simplifies the storage, processing, modelling and presentation of information and expedites decision making.

Each student includes all the compulsory modules (rows C) for all three study years and choose modules as supportive electives (E) per semester to obtain at least 120 credits for each year of study.

DISCIPLINE	**ENVIRONMENTAL GEOGRAPHY**	**GEOGRAPHY AND LIFE SCIENCES**	**GEOGRAPHY AND TOURISM**	**ENVIRONMENTAL GEOGRAPHY**	**GEOGRAPHY AND LIFE SCIENCES**	**GEOGRAPHY AND TOURISM**
CODE	**QC433359**	**QC433375**	**QC433392**	**QC433359**	**QC433375**	**QC433392**
YEAR	**FIRST**			**FIRST**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C1	GEOG1514 BIOL1514 MATM1534	GEOG1514 BIOL1514 MATM1534	GEOG1514 BIOL1514 EBCS1514 EBUS1514	GEOG1624 BIOL1624 BIOL1644	GEOG1624 BIOL1644 BIOL1624	GEOG1624 GEOT1624 EBCS1524 EBUS1624
ELECTIVES	EBCS1514 CHEM1552 PHYS1534	CHEM1552 EBCS1514 EBUS1514		CHEM1642 MATM1644 EBCS1524 PHYS1644	CHEM1642 EBCS1524 EBUS1624 MATM1644	
REQUIRED *if NBT < 65%	CSIQ1531 UFSS1504 *EALN1508	CSIQ1531 UFSS1504 *EALN1508	CSIQ1531 UFSS1504 *EALN1508	CSIQ1541	CSIQ1541	CSIQ1541
YEAR	**SECOND**			**SECOND**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C2	GEOG2614 GISS2614 BIOL2614 GEOG2634	GEOG2614 GISS2614 BIOL2614 GEOG2634	GEOG2614 GEOG2634 GEOT2614 SOCD2614	BIOL2644 GEOG2624 GEOG2644 GISS2624	BIOL2644 GEOG2624 GEOG2644 GISS2624	GEOT2624 GEOG2624 GEOG2644 SOCP2624
ELECTIVES						
YEAR	**THIRD**			**THIRD**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C3	GEOG3714 GEOG3734 GEOG3754 BIOL3714	BIOL3714 GEOG3714 BOTA3754 ZOOL3714	GEOT3714 GEOT3734 GEOG3754 EBUS2714	GEOG3724 GEOG3744 GEOG3764 GISS3724	GISS3724 BOTA3724 GEOG3724 GEOG3744	GEOT3724 GEOT3744 GEOG3764 GEOG3724
ELECTIVES						

12.2.5 BACHELOR OF SCIENCE IN THE MATHEMATICAL SCIENCES

(Students in their first of second year of study who want to transfer to this programme and have all required modules can transfer).

LEARNING PROGRAMMES MATHEMATICAL SCIENCES FIELDS OF INTEREST 1

Learning programmes in Chemical and Physical sciences offer THREE main options with either Mathematics and Physic or Chemistry OR Computer Science as the three majors or each student Includes all the compulsory modules (row C) for all three study years enough electives modules (row E) per semester to obtain at least 120 credits per year in the first year and the second year.

DISCIPLINE	MATHEMATICS AND PHYSICS	MATHEMATICS & CHEMISTRY	MATHEMATICS & COMPUTER SCIENCE	MATHEMATICS AND PHYSICS	MATHEMATICS & CHEMISTRY	MATHEMATICS & COMPUTER SCIENCE
CODE	**QC433840**	**QC433821**	**QC433822**	**QC433840**	**QC433821**	**QC433822**
YEAR	**FIRST**			**FIRST**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C1	MATM1534 PHYS1514/PHYS1534	MATM1534 CHEM1551 + CHEM1513	MATM1534 CSIQ1614 CSIQ1553	MATM1622 MATM1644 PHYS1624	MATM1622 MATM1644 CHEM1623 + CHEM1661	MATM1622 MATM1644 CSIQ1624 CSIQ1623
ELECTIVES E1	CSIQ1614 CSIQ1553 CHEM1551+CHEM1513	CSIQ1614 CSIQ1553 PHYS1514/PHYS1534	CHEM1551+CHEM1513 PHYS1514	CHEM1623 + CHEM1661 CSIQ1624 CSIQ1623	PHYS1624 CSIQ1624 CSIQ1623	PHYS1624 CHEM1623 + CHEM1661
REQUIRED *if NBT < 65%	CSIQ1531 UFSS1504 *EALN1508			CSIQ1541		
YEAR	**SECOND**			**SECOND**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C2	MATA2654 MATM2614 PHYS2614 PHYS2632	MATA2654 MATM2614 CHEM2633 + CHEM2631 CHEM2613 + CHEM2611	MATA2654 MATM2614 CSIQ2634 CSIQ2654 CSIQ2614	MATM2624 MATM2664 PHYS2624 PHYS2642	MATM2624 MATM2664 CHEM2623 + CHEM2621 CHEM2643 + CHEM2641	MATM2624 MATM2664 CSIQ2644 CSIQ2624
ELECTIVES E2	CSIQ2634 CSIQ2654 CSIQ2614 CHEM2633+CHEM2631 CHEM2613+CHEM2611	CSIQ2634 CSIQ2654 CSIQ2614 PHYS2614 PHYS2632	CHEM2633+CHEM2631 CHEM2613+CHEM2611 PHYS2614 PHYS2632			
YEAR	**THIRD**			**THIRD**		
SEMESTER	**FIRST**			**SECOND**		
COMPULSORY C3	MATM3714 MATM3734 PHYS3714 PHYS3732 PHYS3752	MATM3714 MATM3734 CHEM3713 + CHEM3711 CHEM3733 + CHEM3731	MATM3714 MATM3734 CSIQ3714 CSIQ3734	MATM3724 MATM3744 PHYS3724 PHYS3742 PHYS3762	MATM3724 MATM3744 CHEM3723 + CHEM3721 CHEM3743 + CHEM3741	MATM3724 MATM3744 CSIQ3724 CSIQ3784

12.3 BACHELOR OF SCIENCE HONOURS
HONOURS LEARNING PROGRAMMES

Students register for all compulsory modules plus enough other to obtain at least 120 credits

DISCIPLINE	BOTANY	ZOOLOGY	PHYSICS	POLYMER SCIENCE	GEOGRAPHY	COMPUTER SCIENCE
NEW CODE	QC460021	QC460049	QC460040	QC460084	QC460033	QC460022
			FIRST & SECOND SEMESTER			
COMPULSORY	BOTA6808 BIOL6814 BIOL6834 BIOL6824	ZOOL6808 BIOL6814 BIOL6834 BIOL6824	PHYS6808 PHYS6814 PHYS6834 PHYE6824 PHYE6844 PHYI6834 PHYI6874 PHYR6814 PHYI6864 PHYS6844	CMPR6808 CMPO6814 CMPP6814 CMPR6814 CMPA6814 CMPA6824 CMPB6824 CMPC6824	GEOG6808 GEOG6816 GEOG6814	This programme will be presented over two years and students need to register for two modules at UNISA. **Year 1** BIOL6814 CSIQ6833 CSIQ6809 CSIQ6863 **Year 2** CSIQ6853 CSIQ6863 **UNISA MODULES** INF4831 INF4883
ELECTIVES	**THREE OF:** BOTA6814 BOTA6824 BOTA6844 BOTA6864 ZOOL6804 Any other 16 credit Honours module approved by the Programme Director	**THREE OF:** ZOOL6814 ZOOL6854 ZOOL6824 ZOOL6834 ZOOL6844 ZOOL6808 Any other 16 credit Honours module approved by the Programme Director			GEOG6824 GEOG6826 GEOG6836 GEOG6846 ZOOL6804	

12.4 MASTER OF SCIENCES

These learning programmes aim at:

(a) providing the candidate with the opportunity to present evidence of advanced study and research characterised by intellectual independence and advanced knowledge of a specialisation area in the subject, as well as accurate evaluation of his/her own results and that of others by production of a thesis which places his/her research in broader context and which is capable of withstanding international intellectual scrutiny.

(b) developing the candidate in order to demonstrate knowledge and understanding of supervised planning and execution of a research project in the discipline. This project includes hypothesis formulation, collecting appropriate experimental materials, optimising techniques and procedures, data acquisition, analysis and interpretation of results, and writing of a dissertation according to a structured format and related literature.

The minimum term of this study is 2 years and a total of 180 credits are allocated for this degree. The candidate may do a research Masters programme with a full dissertation or a structured Masters programme depending on the discipline in which they want to register. In cases where an MSc degree consists only of a dissertation the programme code will start with 471 and in the case where the MSc degree consists of both course work and research the programme code will start with 472.

- If the full dissertation option is followed the candidate must do research on an approved topic for at least two semesters, in consultation with the Departmental Chairperson, in preparation for a dissertation that shall be submitted as the only requirement for the degree. Candidates may be required to present at least one seminar/research report in each year in accordance with departmental rules.
- If the structured Master programme is all prescribed modules, a compulsory research essay must be completed. The topic for the research must be determined in consultation with the Departmental Chairperson. Candidates may be required to present at least one seminar/research report.

RESEARCH MASTERS								
YEAR 1 + 2								
Botany	QC480020	BOTA8900	**Physics**	QC480040	PHYS8900	**Environmental Geography**	QC480059	GEOG8900
Chemistry	QC480021	CHEM8900	**Polymer Sciences**	QC480084	PLYS8900	**Zoology**	QC480049	ZOOL8900
Computer Science	QC480022	CSIQ8900	**Geography**	QC480033	GEOG8900			

12.5 DOCTOR OF SCIENCES DEGREES (NQF LEVEL 10)

12.5.1 DOCTOR OF PHILOSOPHY (PhD) 49119, 49140, 49149

These learning programmes aim at:
(a) providing the candidate with the opportunity to prove her/his ability to plan and do research independently and to report the results;
(b) enabling the candidate to make an original contribution to the discipline.
The minimum term of this study is 3 years and a total of 360 credits are allocated for this degree. The candidate must do research for at least four semesters on an approved topic selected in consultation with the Departmental Chairperson in preparation to complete the thesis (360 credits). The degree study therefore lasts three years. The candidate will present at least one seminar/research report in each year of study in accordance with departmental regulations.

Candidates can register for a PhD with specialisation in one of the following area:

Botany	QC490020	BOTA9100	**Physics**	QC490040	PHYS9100	**Environmental Geography**	QC490059	GEOG9100
Chemistry	QC490021	CHEM9100	**Polymer Sciences**	QC490084	PLYS9100	**Mathematics**	QC490038	MATM9100
Computer Science	QC490022	CSIQ9100	**Geography**	QC490033	GEOG9100	**Zoology**	QC490049	ZOOL9100

13. MODULE CONTENT FOR UNDERGRADUATE MODULES ALPHABETICALLY PER INTEREST FIELD AND DEPARTMENT

ABBREVIATION AND NUMBERING SYSTEM

Each module of the subject is represented by a three-digit module code, in which the year of study and semester of presentation (unless otherwise stated) are combined. In addition, the credit value, NQF level, CESM code, prerequisite pass and/or prerequisite and co-requisite modules for each, modular name, contact sessions, content and assessment for each module are given.

This is a promotion module: if a candidate participates in all assessments and obtains an average semester mark above 75%, this candidate need not write the final exam – their semester mark will become their final mark.

Key:

Subject						
Module code	**Credit value**	**NQF-level**	**CESM code**	**Prerequisite pass and/or prerequisite and co-requisite modules for each**	**Module name**	**Contact sessions**
Content					**Assessment**	

Example:

BOCB2616	**24**	**6**	**CESM: 130201**	**Two of the following: BLGY1623 and (CHEM1624 OR 60% pass in CHEM1644 or CHEM1532 + CHEM1622 + CHEM1661)**	**Biochemistry of biological compounds**	**3L, 4P**
An introduction to the most important principles governing biochemistry. The module is designed to expand on the foundation that the student has acquired in chemistry and biology modules and to provide a biochemical framework that allows understanding of new phenomena.					Semester tests and class tests. One examination paper of three hours.	

Explanation
Subject: Biochemistry: Module BOCB2616:
Module code

- First digit: 2 – refers to the year of study in which the module is presented.
- Second digit: is a number that discriminates between modules of the same subject in the same year of study and refers to the semester (unless stated otherwise), according to the following pattern explained earlier (p. XXXX), (Uneven numbers: modules offered in the first semester; Even numbers: modules offered in the second semester; 0,9: modules offered over two semesters, i.e. a year module).
- Third digit: multiply by 4 to indicate the credits.

Contact sessions

- The number of contact sessions of each module is indicated in the square following the module subject.
- The following abbreviations are used:
- L – lectures lasting 50 minutes each (e.g. 1L, 2L)
- P – practical periods lasting 50 minutes each (e.g. 1P, 2P, 3P)
- S – seminars lasting 50 minutes (e.g. 1S)
- T – tutorials lasting 50 minutes each (e.g. 1T, 2T)
- D – discussion lasting 55 minutes each (e.g.3D)
- B – block sessions over one week (e.g. 3B)

- BOCB2616 is therefore offered as a module during the first semester of the second year and a student will acquire 24 credits on completion at NQF Level 6.
- Before a student can register for this module the following prerequisites need to be met: two of the following BLGY1623and (CHEM1624 OR 60% pass in CHEM1644 or CHEM1532+CHEM1622+CHEM1661)
- The contact sessions of BOCB2616 amount to three lectures plus four practicals per week for the duration of the module, i.e. one semester.
- The content of the module as well as the assessment mode is indicated in the next two blocks.

NATURAL SCIENCES

BIOLOGICAL SCIENCES

13.1. DEPARTMENT OF BOTANY

BOTA2654	**16**	**6**	**130301**	**BIOL1624**	**Introduction to plant anatomy and morphology**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Biology, including anatomy, structure and organisation of the cell wall, ergastic substances, structure and development of the ovule and embryo sac, structure, organisation and characteristics of tissues (parenchyma, collenchyma, sclerenchyma, epidermis, periderm, phloem, xylem) and secretory structures.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
BOTA2684	**16**	**6**	**131002**	**BIOL1624**	**Plant physiology and biotechnology**	**3L,3P**
Physiological processes in plants, such as water uptake by plants, translocation, and transpiration, carbon partitioning, nutrient uptake, mineral nutrition, growth regulators, plant movement, photomorphogenesis, biological clock, photoperiodism and adaptation to extreme environments. Plant biotechnology course will look at alternative cultivation techniques of plants: plant nutrient cycles, organic and hydroponic cultivation of plants. The course will also focus on secondary products in plants, i.e. their economic and medicinal value.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 3 hours.	
BOTA3724	**16**	**7**	**130399**	**BOTA2684**	**Plant metabolism and the environment**	**3L,3P**
Plant respiration: cytosolic and mitochondria reactions, measurement of plant respirations, fermentation, regulation of plant glycolysis with special reference to key enzymes, the physiological role of the alternative oxidative pentose phosphate pathway (OPP Pathway), and the effects of environmental factors on respiration. Photosynthesis: the chloroplast and associated pigments, photochemical and non-photochemical reaction of photosynthesis, photophosphoryylation (cyclic and non-cyclic), C3-reduction cycle, photorespiration, C4- and CAM-photosynthesis. The methodology in determining photosynthetic rate through fluorescent techniques, and effects of environmental factors on photosynthesis. Nitrogen metabolism: the stages of the nitrogen cycle such as fixation, assimilation and transamination.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 3 hours.	
BOTA3734	**16**	**7**	**130399**	**BOTA2654**	**Introduction to Plant Systematics**	**3L,3P**
This module describes the plant kingdom and the position of angiosperms within it. Plant fossils and evolutionary history of all plant groups will be discussed, as well as the evolution of flowers, pollination, breeding systems, reproductive isolation and hybridization. Students will learn about the taxonomic system and main subdivisions within the angiosperms. They will learn to apply evolutionary theory, speciation and cladistics as a method for deriving phylogenetic trees, and they will learn to apply the rules of nomenclature. Students will learn to assess taxonomic evidence and various types of characters used in plant identification. They will be able to use molecular data in deriving phylogenetic trees. Finally, students will gain an overview of basic biogeography and the concept of biodiversity hotspots.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 3 hours.	
BOTA3744	**16**	**7**	**130399**	**BOTA2684**	**Ethnobotany and Plant Defence**	**3L,3P**
Basotho ethnology, ethnogeography and ethnobotany, basic traditional medicines preparations. Defence mechanisms of plants against biotic and abiotic stress factors on physiological-biochemical level. Constitutive and induced defence, structural and biochemical defence, hypersensitive reactions, systemic acquired resistance, signal mechanism and manipulation of resistance. Biotechnological application of plants: e g. Propagations techniques, chemical reactions to produce desired products of industrial and pharmaceutical importance. Principles, applications and economic potential of Basotho medicinal plants, algal biotechnology. Design of bioreactors, candidate species for plant and algal biotechnology, practical experience in micropropagation techniques and field trials.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
BOTA3754	**16**	**7**	**130399**	**BIOL2644**	**Vegetation Ecology**	**3L,3P**
Ecosystems and vegetation processes. Primary productivity and biomass production. Global Biomes and South African Biomes and their relation with climate. Plants and soils, water holding capacity of soils, soil formation and classification of horizons. Plant population ecology. Dispersal, recruitment and clonal growth. Plant functional types and life histories, theories of competition and other plant interactions. Responses to stresses and disturbances. The Braun-Blanquet method of vegetation sampling, plot size, cover-abundance scale. Classification and ordination. Direct and indirect gradient analysis and various multivariate techniques. Vegetation dynamics, in terms of gap dynamics, fire and grazing. Vegetation mapping. Species diversity and ecosystem processes.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
BOTA6808	**32**	**8**	**130601**	**Selection to Honours degree**	**Research Project**	**6D**
The student will conduct a research project depending on the speciality of the supervisor. The research project will be in plant sciences as deemed necessary by the supervisor. The student will be expected to submit a research proposal and after its approval research will be conducted and then presented orally and finally a written research report (dissertation, which may be in article format)					Continous assessment of mini-dissertation or article)	

BOTA6814	**16**	**8**	**130601**	**Selection to Honours degree**	**Restoration Ecology**	**1L,1P**
Principles of green economics: valuation of natural resources and ecosystem services. Restoration planning, indicator species and restoration targets. Restoration targets as based on species, on ecosystem processes or on ecosystem services. Soil enhancement techniques and bio-engineering. Formation of erosion gullies. Hydrology and water balance in river catchments. Revegetation, ecological assembly and population viability analysis. Spatial scale and landscape context. Island biogeography in landscape management. Monitoring and ecological management, fire, herbivory, aftercare of restoration work.					Continuous evaluation.	
BOTA6824	**16**	**8**	**130601**	**Selection to Honours degree**	**Plant Ecophysiology**	**1L**
Plant ecophysiology is the study of how plants function in diverse environments and their physiological responses to environmental and climate change. The processes occurring in plants during instantaneous stress response, acclimation and adaptation to stress are investigated. The course will focus on how plant growth is affected by certain environmental stress factors including nutrient availability and deficiency, alluminium in the soil, ecohydrology, light stress, water deficit and air pollution on plants. The course will also focus on how physiological activities are affected by pathogens and availability of light, water, nutrients and atmospheric CO2. How respiration in roots is affected by flooding, salinity and water stress.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
BOTA6844	**16**	**8**	**130601**	**Selection to Honours degree**	**Plant Biotechnology**	**3L,3P**
This module introduces students to principles, techniques and applications of plant biotechnology. The students will learn about the techniques in plant tissue culture, an introduction on recombinant DNA technology, the application of genomics and proteomics technologies in studying genes and traits of interest for transgenic plants, the different ways in which transgenic plants are produced and analysed. The regulation and biosafety of plant biotechnology will be discussed as well as why transgenic plants are controversial.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
BOTA 6864	**16**	**8**	**130301**	**Selection to Honours degree**	**Phytomedicine**	**3L,3P**
Principles of Basotho ethnography, indigenous knowledge of medicinal plants, collection and identification of plants, using the herbarium, resources utilization and implications (Underutilization and over exploitation), methods preparation of herbal remedies and scientific validation of implicated plants in terms of validation of folkloric claims.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	

13.2 DEPARTMENT OF ZOOLOGY AND ENTOMOLOGY

ZOOLOGY

ZOOL2614	**16**	**6**	**CESM: 130602**	**BIOL1644**	**Basic entomology**	**3L,3P**
This module consists of both theoretical and practical units, giving students a broad introduction to the study of insects. Topics covered include insect physiology, evolution, and taxonomy. Students will be given practical tools to start in the field of entomology, within a sound scientific, hypothesis-based framework. Upon completion of this module, students will have acquired skills in insect taxonomy that will enable them to identify insects to order and family level. Students will also understand the composition of the diverse variation in form and structure of the insect body. Students will learn how insects are able to survive under diverse conditions. Students will also have insight into where insects fit into the animal kingdom and be able to describe the unique entomological fauna of southern Africa.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
ZOOL2634	**16**	**6**		**BIOL1644**	**Invertebrate biodiversity**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Biology, including an overview of upper classification through all invertebrate phyla. This will include the general taxonomy, anatomy, morphology, physiology, ecology, evolution and benefits to humans. In practical sessions the students will be introduced to all phyla and taught how to identify invertebrates from phylum to order level. Phyla included in course are: Porifera, Placozoa, Cnidaria, Ctenophora, Mesozoa, Plathelminthes, Nemertea, Rotifera, Acanthocephala, Gnathostomulida, Micrognathozoa, Nematoda, Nematomorpha, Priapulida, Kinorhyncha, Loricifera, Annelida, Mollusca, Arthropoda, Tardigrada, Onychophora, Gastrotricha, Chatognatha, Cycliophora, Phoronida, Brachiopoda, Bryozoa, Entoprocta, Echionodermata, Hemichordata, Xenoturbellida, Chordata (the non vertebrate specimens).					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
ZOOL2664	**16**	**6**	**130601**	**BIOL1644**	**African vertebrates**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Zoology, including several aspects and principles of the study of African vertebrates, including the principles of vertebrate systematics, physiology, morphology, anatomy, ecology and ethology, as well as key terms, concepts, facts, principles, rules and theories associated with vertebrates. Students will undergo both theoretical and practical training, acquiring a grasp of laboratory and field-based research techniques. After successful completion of this course a student will be able to identify African vertebrates and be well informed on the basic concepts of vertebrate ecology in the southern African sub-region.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	

ZOOL2684	**16**	**6**	**130601**	**BIOL1644**	**Introduction to Parasitology**	**3L,3P**
This module introduces students to the practical and theoretical aspects of studying parasites. Topics include taxonomic classification of parasites, host spectrum, geographical distribution, morphology, life cycles, epidemiology, parthenogenesis, control measures and public significance and vectors of medical and veterinary importance.						Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 3 hours.
ZOOL3714	**16**	**7**	**130604**	**BIOL2644**	**Introduction to Animal Behaviour**	**3L,3P**
This course introduces students to the scientific study of animal behaviour through an evolutionary lens, including aspects of human behavioural ecology. Tinbergen's four questions will be applied to the study of animal behaviour, i.e., the functional, phylogenetic, mechanistic and developmental aspects of behaviour. This course will also introduce principles of optimal foraging theory, predator-prey interactions, social behaviour, decision-making theory, learning, communication, cognition, and the physiological control of behaviour. Successful students will be prepared for the advanced course in Behavioural Ecology (ZOOL6814) and will be able to apply their knowledge of behavioural ecology to biodiversity conservation, wildlife management, animal husbandry, and the more theoretical field of biological psychology.						Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.
ZOOL3724	**16**	**7**	**130399**	**BIOL2614**	**Introduction to Ecotoxicology**	**3L,3P**
This course is aimed at undergraduate students who have completed basic chemistry and biology courses. It provides a general introduction to the field of ecotoxicology and covers topics such as environmental contamination, major classes of contaminants and acute/chronic effects of contaminants on individuals, populations, communities and ecosystems. Through an accompanying practical program, emphasis is also given on the assessment of the toxicity of potential environmental contaminants in the laboratory.						A mini-research project and report, a scientific literature based assignment, two formal semester tests and a final examination of at least 3 hours.
ZOOL3734	**16**	**7**	**CESM: 130602**	**ZOOL2614**	**Insect ecology**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Entomology, including class discussions based around insect ecology and various ecological concepts from the interaction between insects and their abiotic environment, insects and other individuals within the same species as well as between specimens of different species. Students will investigate symbiotic relationships, as well as their evolutionary development. The course is designed around the creation of hypotheses and experimental design to test these ecological theories. Students are expected to find South African examples for various ecological concepts, and be able to design experiments around South African conditions. Furthermore, students are taught to argue various statements, as well as formulate their own opinions around various ecological topics. Students are also expected to find additional literature in the form of articles to justify their arguments. Students will be taught various ecological statistical analyses and calculations used during environmental evaluation and related ecological studies.						Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.
ZOOL3744	**16**	**7**	**130504**	**ZOOL2684**	**Molecular parasitology**	**3L,3P**
This module introduces students to parasite genomics whereby the identity and functions of important genes and proteins of selected parasites will be studied. Practical techniques of parasite diagnostics, such as PCR and LAMP, will be demonstrated and practiced. These techniques are used for diagnosis of parasite infections targeting specifically expressed genes or unique sequences on non-specific genes. Further techniques will also be practiced, such as ELISA, in which recombinant proteins are used as antigens in serological assays. Students will understand the basic functions of the immune system and different types of the immune system (innate and adaptive). This study will include in-depth coverage of molecules used by immune system to combat parasite infections. Lastly, the course details antigenic variation, a common strategy used by parasites to evade immune systems.						Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.
ZOOL3764	**16**	**7**	**CESM: 130602**	**ZOOL2614**	**Applied entomology**	**3L,3P**
This module will teach students to apply their knowledge of entomology to manage pest species or to use insects beneficially. The theoretical aspect will be divided into four main modules: chemical control of pests, biological control of pests, additional methods of controlling pests, and beneficial uses of insects. The practical side of the course will look at the major pests of fruit, vegetable, wood and livestock practices. Students will identify major pests, calculate thresholds, and recommend treatment plans. Topics will include: basic entomological practices in the agricultural environment, insects as pests, intergraded pest management, thresholds, insecticides, insecticide toxicity and environmental fate, host plant resistance, transgenic crops, storage and transport pest management, vectors and vector control, biological control, nematology, forest, tree, and garden pest management, bee keeping, decomposers, biomonitoring, insect conservation and trade markets, urban and public health entomology, the role of insects in aesthetics, art, culture and leisure practices.						Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.

ZOOL6814	**16**	**8**	**130601**	**Selection to Honours degree**	**Applied behavioural ecology**	**3L**
Students will use both the primary literature and hands-on research experience to gain a holistic understanding of the latest advances in the wide-ranging field of animal behaviour – ranging from invertebrates to humans. This course will enable students to apply principles of behavioural ecology to animals in the wild, under laboratory conditions, within captive situations (e.g., zoos and breeding centres), as well as human behaviour on both a small and large scale. Students will know how to manage and improve animal welfare and also assess patterns within human society that can be applied to political science, epidemiology, economics and psychology. A sound knowledge of behavioural studies prepares students for various careers in nature conservation, agriculture, academic institutions and consultation.					This is a formative, continuous assessment course in which students write four capstone assignments throughout the semester to combine into an electronic portfolio. These assignments will cover topics including conservation behaviour in SA, pop psychology, animal enrichment, and book evaluation.	
ZOOL6824	**16**	**8**	**130601**	**Selection to Honours degree**	**Veterinary parasitology**	**3L,3P**
Students will learn about the different habitats of vectors, their adaptations to habitats, feeding behaviour and host preferences. They will acquire advanced knowledge on the life cycle stages of endoparasites in and outside the host. Factors conducive to propagation of parasites including temperature, vegetation, soil, rainfall will also be covered in this module.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
ZOOL6844	**16**	**8**	**130601**	**Selection to Honours degree**	**Biosystematics**	**3L,3P**
Each student will choose an invertebrate taxonomic group whose taxonomy they will re-evaluate according to recent academic literature. They are required to write a scientific review of this taxonomic group with basic descriptions of classification within this taxon, general information available on the biology, ecology, physiology, biochemistry and conservation status of the chosen taxon. Additionally each student have to create a dichotomous key for the species within a given area (South Africa, Free State, or Qwaqwa region) that have been described, as well as design a poster around the taxonomy of the chosen group. This course will give students interested in other taxa not dealt with in detail within the department the opportunity to study them for academic credits. Additionally students must make a reference collection of the chosen taxon for the region. It will be recommended for students to take a taxon relative to their main honours research project.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
ZOOL6854	**16**	**8**	**130601**	**Selection to Honours degree**	**Immunology**	**3L, 3P**
The objective of this course is to learn about the structural features of the components of the immune system as well as their functions and to attain a working knowledge of current immunological principles as they relate to the cells and molecules of the immune system, how they interact in defending the body against invading microorganisms, how they develop and acquire the ability to recognize antigens, and finally how they malfunction in autoimmune diseases and how they become inadequate in immune deficiency states. Furthermore, students will extend and solidify their understanding of the presented principles through critical readings from the primary research literature. Reading of research papers will help introduce students to research techniques and also help them appreciate the value of scientific research.						
ZOOL6808	**32**	**8**	**0**	**Selection to Honours degree**	**Research Project**	**3L, 3P**
The student will conduct a research project depending on the speciality of the supervisor. The research project will either be in zoology field or entomology field related to life sciences as deemed necessary by the supervisor. The student will be expected to submit a research proposal and after its approval research will be conducted and then presented orally and finally a written research report (dissertation, which may be in article format)					Continous assessment and mini-dissertation or article	
ZOOL6804	**32**	**8**	**0**	**BSc degree**	**Science for Society**	**3L, 3P**
This is a year long module in which students have to combine skills from both natural and social sciences to address real problems in the community. Students will work in small groups to find creative yet practical ways to start addressing problems in the community (that can be solved through science), or to develop ways of using science to improve conditions in the local community. Stakeholders from the local community will be involved from the start of the year, to give their views on issues they feel scientists may address; and at the end of the year, their feedback on the success of the intervention(s) will be obtained. Through a process of iterative action research, students will develop and assess new interventions and learn about the process of socially responsible science. This module is seen as a vehicle for students to gain interdisciplinary research abilities, group-work and project-management skills.					Continuous evaluation	
ZOOL6834	**16**	**8**	**CESM: 130602**	**Honours degree**	**Essential Readings in Science**	**3L, 3P**
The students will choose a main zoology or entomology field and plan a short course around this topic. They will have to gather topics and background information from textbooks and relative literature, and logically arrange a course layout. Furthermore, the student has to create classes and teaching aids on this topic. Each student also has to design a project for an additional practical class as well as evaluation criteria, test and memorandum. Each student will have to choose an addition science important book to read and write a report on. Students will additionally have to read scientific articles for weekly discussion classes.					Continuous evaluation	

BIOLOGY

BIOL1514/ BIOL1504	**16**	**5**	**130601**	**NCS level 5 Life Sciences or Physical Sciences NCS level3 Life Sciences or Physical Sciences**	**Lower life and molecular biology**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Biology, including conditions on early earth, chemical evolution, appearance of cells, origin of metabolism, self-replicating systems, origin of pro and eukaryotic cells, origin of membranes and organelles, cell division, energy harvesting pathways: photosynthesis. The Flow of genetic information: mitosis and meiosis, DNA replication and patterns of inheritance and the application are included. The following are also covered: bacteria and viruses, protists, single celled algae and fungi.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 3 hours.	
BIOL1624	**16**	**6**	**130301**	**BIOL1514 or BIOL1504**	**Introductory plant biology**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Biology, including Development and reproduction of flowering plants, plant multiplication, plant taxonomic principles, biodiversity, ecology, economic importance of plants.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
BIOL1644	**16**	**6**	**130601**	**BIOL1514 or BIOI1504**	**Animal biology**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Biology, including higher levels of the kingdom Animalia, a thorough briefing on Invertebrata and an introduction to Vertebrata. Topics covered include an introduction to invertebrate classification and bio-ecology, insect morphology, anatomy and metamorphosis, basic entomology and its application, including insect plant relationships, medical, veterinary and forensic entomology, insect physiology and pest control. Finally, students will learn about mammalian zoogeography, evolution and etho-ecology.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
BIOL2614	**16**	**6**	**130601**	**BIOL1624 & BIOL1644**	**Evolution, genetics and diversity**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Biology, including Students will be introduced to the principles of evolutionary theory, including the following key concepts: species concepts, scientific names, binomial and sub-specific ranks, Darwin's theory of evolution, Mendelian genetics, the modern synthesis, variability in populations: population genetics and Hardy-Weinberg equilibrium, natural selection and genetic drift, molecular genetics, the genetic code, distribution ranges, dispersal, biogeography and reproductive isolation. Students will receive a practical introduction to methods such as Polymerase Chain Reaction, gene sequencing, deriving phylogenetic trees, phenetics and phylogenetics.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
BIOL2644	**16**	**6**	**130601**	**BOTH BIOL1644 + BIOL1624**	**Introduction to ecology**	**3L,3P**
This module contains fundamental knowledge, theories, principles and practices of Biology, including an introduction to the discipline of systems ecology, including ecosystem modeling and compartment models. Biogeochemical cycles, primary production and flow of energy and matter through ecosystems. Food chains and food pyramids. Importance of water and the various aquatic habitats. Carbon cycle and global warming. Role of biodiversity in ecosystems, competition for resources, predation and parasitism. Stress and disturbance, K and r strategists, basic population biology. Dispersal and reproduction of organisms. Human dependence on ecosystems, use of natural resources and the principle of sustainability. The link between ecology and economy and ecosystem degradation.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
BIOL2674	**16**	**6**	**131002**	**NCS MATH LEVEL 5 OR MATD1564**	**Biostatistics**	**3L,3P**
This module will give students a thorough, applied grounding in the basic statistics used in the life sciences, including descriptive statistics, creation and testing of hypotheses, t-tests, chi-squared test, basic non-parametric and parametric analyses up to the one-way ANOVA. Successful students will be able to assess and interpret univariate statistics and become confident in judging which statistical tests to apply to specific datasets. Students will have a solid grounding in the analysis of data using pocket calculators and simple statistical packages. This course will also introduce students to the basics of multivariate statistics.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
BIOL3714	**16**	**7**	**131201**	**BIOL2644**	**Human ecological footprint**	**3L,3P**
The influence of human activities on ecosystems is critically reviewed, which includes man's ecological footprint, biodiversity, speciation, extinction and Africa's natural history. Several conservation issues are analysed, including an evaluation of the state of our natural resources, translocation and introduction of organisms, threats to biodiversity with a focus on southern African species, an introduction to conservational areas in southern Africa, environmental management, climate change and an exploration of alternative, sustainable sources of energy. After successfully completing this module, the student will be able to critically evaluate human impact on the environment and will be able to provide practical solutions for environmental problems.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	
BIOL3724	**16**	**7**		**BIOL2614**	**Macroevolution and speciation**	**3L,3P**
This module describes the history of life, focusing on the phenomena of natural selection and adaptation, as originally postulated by Darwin. A broad perspective will be taken, encompassing evidence from plate tectonics, fossil records, evolutionary genomics, homologies, embryology and modern-day biodiversity. Important concepts such as inheritance of characteristics, stochastic mutations, and the various processes that drive speciation will be addressed. Students will gain an invaluable, scientific perspective on the abundance and origins of life on Earth.					Formative practical experiment , assignments and two formal semester tests a final summative assessment, examination of at least 2 hours.	

BIOL6814	**16**	**8**	**130601**	**Qualifying for BSc Hons**	**Scientific methodology and communication**	**1L, 3P**
Description of five principles of science. Description of hypothesis. Description of theory with discussions on world's popular theories. Definition of research, its significance and discussions on practical products of research available in our daily life. A breakdown on how to write a research proposal including literature review, justification, objectives, materials and methods, milestones/time frames, budget, data analysis and references. What is plagiarism, why do people plagiarize and how to avoid plagiarism. Step by step protocols of searching and downloading articles, genes, amino acids, alignment of sequences on online databases with practical at the library. Different laboratory techniques depending on students research specialty such as microscopy and molecular techniques. Field research techniques, application for permits, animal ethics, sample collection (animal and plant).					Continous assessment of mini-dissertation or article	
BIOL6824	**16**	**8**	**130601**	**Qualifying for BSc Hons**	**Current events in Science**	**2L + 2T**
Each student will choose a topic relevant to events from the previous year on a global scale. Regular topic fall into the main categories of: natural disasters, accidents due to human error, exploitation of natural resources; disease outbreaks; new ground braking findings within biology and relative fields; conservation practices & malpractices; and governmental policies. Each student must then gather information around the event, history that lead up to the event, the consequences of the event, the management of the event, and future plans for restoration. Furthermore, they have to bring it into perspective and find out how the event affected our country, and how our government and relative associated management would have dealt with a similar event. Each student will also report on interesting media stories, or statements of famous people and their opinions of the event as well as providing their own opinion and solution to the problem or how they would have dealt with the problem differently. The student would have a better understanding of the impact of humanity on the environment as well as being able to debate various relative environmental issues taking inconsideration the view points of all parties involved.					Continous assessment	
BIOL6834	**16**	**8**	**130601**	**Qualifying for BSc Hons**	**Advanced Biostatistics**	**1L,2T**
Exploratory data analysis. Basic statistical programming in R. Multiple regression and Multi-factor ANOVA. Principal Components Analysis, Factor analysis. Cluster analysis. Correspondence Analysis, Canonical Correspondence Analysis, Multidimensional Scaling. PerMANOVA. Discriminant analysis. Presentation of data and interpretation of results. Relevance for community ecology.					Continous assessment	

13.3 DEPARTMENT OF CHEMISTRY

Take note: (CHEM1532 + CHEM1552 + CHEM1622 + CHEM1642 + CHEM1551 + CHEM1661) extended = (CHEM1513 + CHEM1623 + CHEM1551 + CHEM1661) mainstream. Admission to second and third-year chemistry is subject to a selection process as only the 70 best students can be accommodated

CHEM1552	**8**	**4**	**CESM: 140401**		**Introduction to Chemistry-Development module**	**2L,1T**
Mathematical skills (Significant numbers, mathematical calculations, handling of logarithms to the base 10 and natural logarithms, the drawing of graphs on scale on graph paper), Classification of matter, The Periodic table, Chemical formulas and nomenclature, Basic structure of the atom, fundamental principles, ions and formation of molecules, relative atomic mass, molar mass, The mole concept, molar concentration, parts per million and percentage concentration, Introduction to acids and bases, relevant acid-base theories and pH-calculation, Introduction to gases – laws of Boyle, Charles and the combined gas laws as well as the Kelvin temperature.					Continuous: A minimum of 4 assignments. Formal: Two written assessments and a final assessment of at least 1½ hours.	
CHEM1562	**8**	**6**	**CESM: 140404**		**Organic Chemistry**	**2L,1T**
Hybridization of the carbon atom; properties, preparation and reaction of hydrocarbons, alkyl halides, alcohols, ketones, aldehydes, carboxylic acids, derivatives of carboxylic acids; introduction to stereoisomerism and reaction mechanisms.					Continuous: A minimum of4 assignments. Formal: Two written assessments and a final assessment of at least 1½ hours.	
CHEM1622	**8**	**6**	**CESM: 140405**	**CHEM1552**	**Physical Chemistry**	**2L,1T**
Phases and Solutions: Description of the phases of matter and the influence of solutes on the phase characteristics of the gas phase (atmospheric pressure, pressure of a column {barometer, manometer}; Gas laws {Boyle, Charles, Avogadro, Ideal gas law, Dalton, Henry}), Colligative properties (boiling point elevation and freezing point depression), Thermodynamics: elementary calculation on heat transfer, the First Law of thermodynamics, thermochemical processes and introduction to reaction entropy and free energy. Reaction kinetics: Reaction orders and calculation of reaction rates, reaction times and half-lives. Electrochemistry (Voltaïc cell, cell notation, cell potential, spontaneity).					Continuous: A minimum of 4 assignments. Formal: Two written assessments and a final assessment of at least 1½ hours.	

CHEM1513+ CHEM1551	**12+4**	**5**	**CESM: 140403**	**CHEM1552 AND MATHS NCS LEVEL 4 OR MATM1554**	**Inorganic and Analytical Chemistry**	**2L,1T**
Mathematical skills (Significant numbers, mathematical calculations, handling of logarithms to the base 10 and natural logarithms, the drawing of graphs on scale on graph paper), Classification of matter, The Periodic table, Chemical formulas and nomenclature, Basic structure of the atom, fundamental principles, ions and formation of molecules, relative atomic mass, molar mass, The mole concept, molar concentration, parts per million and percentage concentration, Introduction to acids and bases, relevant acid-base theories and pH-calculation, Introduction to gases – laws of Boyle, Charles and the combined gas laws as well as the Kelvin temperature. Empirical and molecular formulas as well as stoichiometry, Quantitative analyses (Gravimetry en Volumetry), Oxidation, reduction, oxidation number and balancing of redox reaction equations ; Quantum mechanical atomic theory, Electron distribution, polarity and periodicity, Bonds, Lewis structures and molecular geometry; Chemical equilibrium and solubility products, Acids, bases, pH and buffers.Experience critical (generic) outcomes with respect to literacy skills (oral and written reasoning), mathematical skills, problem solving skills and experimental skills.						Continuous: A minimum of 4 assignments. Formal: Two written assessments and a final assessment of at least 1½ hours.
CHEM1623+ CHEM1621	**12+4**	**6**	**CESM: 140405**	**CHEM1552**	**Organic & Physical Chemistry**	**3L,3P**
Phases and Solutions: Description of the phases of matter and the influence of solutes on the phase characteristics of the gas phase (atmospheric pressure, pressure of a column {barometer, manometer}; Gas laws {Boyle, Charles, Avogadro, Ideal gas law, Dalton, Henry}), Colligative properties (boiling point elevation and freezing point depression). Thermodynamics: elementary calculation on heat transfer, the First Law of thermodynamics, thermochemical processes and introduction to reaction entropy and free energy. Reaction kinetics: Reaction orders and calculation of reaction rates, reaction times and half-lives. Electrochemistry (Voltaïc cell, cell notation, cell potential, spontaneity). Hybridization of the carbon atom; properties, preparation and reaction of hydrocarbons, alkyl halides, alcohols, ketones, aldehydes, carboxylic acids, derivatives of carboxylic acids; introduction to stereoisomerism and reaction mechanisms. Experience critical (generic) outcomes with respect to literacy skills (oral and written reasoning), mathematical skills, problem solving skills and experimental skills.						Continuous: A minimum of 4 assignments. Formal: Two written assessments and a final assessment of at least 1½ hours.
CHEM1632	**8**	**5**	**CESM: 140403**	**CHEM1552 AND MATHS NCS LEVEL 4 OR MATD1554**	**Inorganic and Analytical Chemistry**	**2L,1T**
Empirical and molecular formulas as well as stoichiometry, Quantitative analyses (Gravimetry en Volumetry), Oxidation, reduction, oxidation number and balancing of redox reaction equations ; Quantum mechanical atomic theory, Electron distribution, polarity and periodicity, Bonds, Lewis structures and molecular geometry; Chemical equilibrium and solubility products, Acids, bases, pH and buffers.						Continuous: A minimum of 4 assignments. Formal: Two written assessments and a final assessment of at least 1½ hours.
CHEM1551	**4**	**5**	**CESM: 140401**	**NSC PS LEVEL 4 OR CHEM1552+CHEM1642**	**Inorganic and Analytical Chemistry (Practical)**	**3P**
Experience critical (generic) outcomes with respect to literacy skills (oral and written reasoning), mathematical skills, problem solving skills and experimental skills.						Continuous: a minimum of 7 practical experiments. A 70% attendance is compulsory for practicals. Formal: A final assessment of at least 1½ hours.
CHEM1661	**4**	**6**	**CESM: 140401**	**NSC PS LEVEL 4 OR CHEM1532+CHEM1622**	**Analytical, Physical and Organic Chemistry (Practical)**	**3P**
Experience critical (generic) outcomes with respect to literacy skills (oral and written reasoning), mathematical skills, problem solving skills and experimental skills.						Continuous: a minimum of 7 practical experiments. A 70% attendance is compulsory for practicals. Formal: A final assessment of at least 1½ hours.
CHEM2613+ CHEM2611	**16**	**6**	**CESM: 140405**	**CHEM1513 + CHEM1551, CHEM1621/1623/1661, MATM1534**	**Physical Chemistry**	**2L, 12P**
Dynamics: Properties of gases and the kinetic molecular theory. Thermodynamics: Advanced application of the first, second and third laws of thermodynamics to chemical systems as well as thermochemical calculations. Phase studies: Properties of liquids and solutions. Phase equilibria: Quantify real gas-, liquid- and solid mixtures. Electrolytic solutions: To quantify electrolytic conductivity and transport. Quantum chemistry: Atomic structure through the Schrodinger equation as well as own functions, own values and amplitudes of selected examples. Quantum mechanics: Application of concepts in practice.						Continuous: A minimum of 10 practical experiments and 7 assignments. Formal: Two written assessments and a final assessment of 2 hours each.

CHEM2623+ CHEM2621	**16**	**6**	**CESM: 140404**	**CHEM1621/1623/1661, MATM1534**	**Organic Chemistry**	**2L, 12 P**
Extension of the chemistry of carbonyl compounds, carboxylic acids and carboxylic acid derivatives. The chemistry of aromatic compounds: structure of benzene, aromaticity, electrophilic substitution, the influence of substituents on electrophilic substitution, aromatic halides and hydrocarbons, carbonyl and nitro compounds, phenols and hydroxycarbonyl compounds. Stereochemistry and conformation: synthesis and reactions of stereo-isomers.					Continuous: A minimum of 9 practical experiments and 7 assignments. Formal: Two written assessments and a final assessment of 2 hours each.	
CHEM2633+ CHEM2631	**8**	**6**	**CESM: 140402**	**CHEM1513 + CHEM1551, CHEM1621/1623/1661, MATM1534**	**Analytical Chemistry**	**1L, 8P**
Basic principles of error of observation and analysis thereof, buffer systems, analytical techniques of gravimetry, oxidimetry and spectrophotometry.					Continuous: A minimum of 6 practical experiments and 4 assignments. Formal: Two written assessments and a final assessment of 1 hour each.	
CHEM2643+ CHEM2641	**8**	**6**	**CESM: 140403**	**CHEM1513 + CHEM1551, CHEM1621/1623/1661, MATM1534**	**Inorganic Chemistry**	**1L, 8P**
Properties of covalent bonding (localized and delocalized) employing the Molecular Orbital theory, calculations on electronegativity, effective nuclear charge and magnetism, molecular geometry, chemical properties of the 3d transition metal ions, chemistry of π-acid ligands and their complexes such as carbonyls, isocyanide, dinitrogen, phosphines and cyano complexes, nomenclature of complex compounds.					Continuous: A minimum of 6 practical experiments and 4 assignments. Formal: Two written assessments and a final assessment of 1 hour each.	
CHEM3713+ CHEM3711	**16**	**7**	**CESM: 140402**	**CHEM2613 + CHEM2611, CHEM2633 + CHEM2631, CHEM2643 + CHEM2641, MATM1644**	**Analytical Chemistry**	**2L, 10P**
Modern analytical techniques such as nuclear magnetic resonance, spectrometry, electroanalytical methods and classical analytical techniques such as potentiometry, voltammetry and amperometry.Gas chromatography, complexometry and UV/visible spectrometry.					Continuous: A minimum of 8 practical experiments and 4 assignments. Formal: Two written assessments and a final assessment of 2 hours each.	
CHEM3723+ CHEM3721	**16**	**7**	**CESM: 140403**	**CHEM3713 + CHEM3711**	**Inorganic Chemistry**	**2L, 10P**
Bonding theories and the chemistry of organometallic complexes, solution behaviour of metal complexes, introductory theory of X-ray crystallography (powder and single-crystal X-ray crystallography) in structure analysis in the solid state, Solid state analyse of ionic compounds in centric cubic space groups. Advanced knowledge on coordination chemistry, specifically aimed at the crystal field and molecular orbital theories (as reflected in simple electronic spectra and magnetic properties), organometallic chemistry, substitution mechanisms in square-planar and octahedral complexes and general industrial and catalytic applications of organometallic catalysts.					Continuous: A minimum of 8 practical experiments and 4 assignments. Formal: Two written assessments and a final assessment of 2 hours each.	
CHEM3733+ CHEM3731	**16**	**7**	**CESM: 140405**	**CHEM2613 + CHEM2611, CHEM2633 + CHEM2631, MATM1644**	**Physical Chemistry**	**2L, 10P**
Dynamics: chemical kinetics and surface chemistry. Thermodynamics: advanced chemical thermodynamics, free energy, chemical equilibrium, multicomponent systems and electrochemistry. Macromolecular chemistry: the syntheses, characterization and molecular mass determination of polymers. Basic principles of nuclear and radiochemistry.					Continuous: A minimum of 8 practical experiments and 4 assignments. Formal: Two written assessments and a final assessment of 2 hours each.	
CHEM3741/43	**16**	**7**	**CESM: 140404**	**CHEM2623 + CHEM2621**	**Organic Chemistry**	**2L, 10P**
The principles and applications of physical techniques (e.g. NMR).Introduction to dynamic stereochemistry. Advanced reactions, mechanisms and their stereochemistry including reactions of carbohydrates, the Diels-Alder reaction, the addition of alkenes (e.g. oxymercuration, hydroboration, analyse addition), nucleophilic addition of aldehydes and ketones (e.g. Wittig reaction, Cannizzarro reaction), alpha substitution of carbonyl compounds (e.g. alpha-halogenation, alkylation of enolate ions) and carbonyl condensation reactions (e.g. Claisen condensations).					Continuous: A minimum of 8 practical experiments and 4 assignments. Formal: Two written assessments and a final assessment of 2 hours each.	

CMPO6814	**16**	**8**	**CESM: 140406**	**Selection for BSc Honours**	**Polymers and Polymerization**	**1L, 2P**
• Concepts and nomenclature • Step polymerization • Radical polymerization • Ionic polymerization • Stereochemistry and coordination polymerization • Copolymerization				After successful completion of the module the student should: 1. Know and understand the basic principles underlying polymer science, and the properties that distinguish polymers from other substances 2. Develop a kinetic/mechanistic understanding of step polymerization 3. Develop a kinetic/mechanistic understanding of free-radical polymerization		One examination paper of 2 hours.
CMPA6824	**16**	**8**	**CESM: 140406**	**Selection for BSc Honours**	**Applied Polymer Science**	**1L, 2P**
• Polymer processing • Additives in polymers • Biomedical applications of synthetic polymers • Polymers for the electronics industry • Speciality polymer applications • Introduction to paints and adhesives				After successful completion of the module the student should: 1. Know and understand the different polymer processing techniques 2. Understand and be able to discuss the purpose of different types of additives in polymers, as well as the influence these additives have on the polymer properties 3. Know, understand and be able to discuss the use of polymers in biomedical applications, the electronics industry, paints and adhesives, as well as other speciality polymer applications		One examination paper of 2 hours.
CMPP6814	**16**	**8**	**CESM: 140406**	**Selection for BSc Honours**	**Physical Polymer Science**	**1L, 2P**
• The amorphous state • The crystalline state • Elastic deformation • Viscoelasticity • Elastomers • Yield and crazing • Fracture and toughening				After successful completion of the module the student should: 1. Understand the chain-like structure of polymers, and be able to describe and explain polymer features like crystalline structure, amorphous structure, glass transitions and melting, models used to explain the morphology in semi-crystalline polymers, and orientation 2. Know and understand the relationships between polymer structure/ morphology and the different physical properties 3. Understand and be able to apply the different principles and models related to the mechanical properties of solid polymers.		One examination paper of 2 hours.
CMPR6814	**16**	**8**	**CESM: 140406**	**Selection for BSc Honours**	**Polymers and Polymer Reactions**	**1L, 2P**
• Inorganic, organometallic and inorganic-organic polymers • Reactions involving polymers • Properties of commercial polymers • Polymer structure-property relationships After successful completion of the module the student should: 1. Know, understand and be able to discuss a number of examples of inorganic, organometallic and inorganic-organic polymers				2. Know and understand the reactions that polymers can undergo, and the structural and morphological factors that have an influence on these reactions 3. Know, understand and be able to discuss the properties of a number of commercially important polymers 4. Be able to relate polymer structures with their thermal and mechanical properties		One examination paper of 2 hours.

CMPB6824	16	8	CESM: 140406	Selection for BSc Honours	Polymer Blends, Composites and Nanocomposites	1L, 2P

- General introduction to polymer blends
- Compatibilization methods in polymer blends
- Characterization of polymer blends
- Properties of polymer blends
- General overview of composites science
- Polymer composite and nanocomposite research: Case studies

After successful completion of the module the student should:

1. Know and understand the concept of polymer blending
2. Understand and be able to explain the morphology of polymer blends, and its relation to the properties of these blends
3. Understand and be able to discuss the different methods used to characterize polymer blends, and be able to interpret and explain the results obtained from these methods
4. Understand and be able to discuss the different compatibility methods used in polymer blending
5. Understand and be able to explain the relation between blend morphology and properties
6. Understand and be able to discuss a number of aspects related to polymer composites and nanocomposites
7. Understand and be able to explain the results presented and discussed in some research-based case studies

One examination paper of 2 hours.

CMPA6814	16	8	CESM: 140406	Selection for BSc Honours	Polymer Testing and Characterization I	1L, 2P

- Theoretical description of polymers in solution
- Number-average molar mass
- Scattering methods
- Frictional properties of polymers in solution
- Chromatographic and polymer separation techniques
- Molar mass distribution
- Chemical composition and molecular microstructure

After successful completion of the module the student should:

1. Understand and be able to explain the principles behind a number of techniques used in polymer analysis and characterization, as well as the instrumental setups and experimental designs of these techniques.
2. Be able to interpret and explain typical results obtained from the different techniques.

One examination paper of 2 hours.

CMPR6808	16	8	CESM: 140406	Selection for BSc Honours	Research Project	1L, 2P

- Mini research project with mini-dissertation

After successful completion of the module the student should be able to:

1. Plan and execute a research project in the field of polymer science
2. Search for relevant literature, read the contents, and critically and comparatively summarise the information obtained from the literature
3. Correctly present and interpret the research results
4. Neatly write a dissertation in the correct format

One examination paper of 2 hours.

13.4 DEPARTMENT OF PHYSICS

PHYS1514	16	5	CESM: 140101	With MATM1534	Mechanics, optics and electricity	3 L, 1 T/P

Logical exposition of fundamental principles and the development of problem solving skills are addressed.
Mechanics: Revision of the elementary concepts: displacement, velocity, acceleration, force, work, energy, power, projectile motion and rotation.
In the above vector quantities and simple calculus is used wherever needed.
Geometrical optics: The electromagnetic spectrum, plane mirrors, spherical mirrors, image formation, thin lenses, optical instruments.
Electricity: Electrical charge, electrical field, electrical potential, current, resistance, circuits.

One examination paper of two hours.

PHYS1624	16	6	CESM: 140101	Min. PHYS1514/PHYS1534, min. MATM1534	Mechanics, thermodynamics, electricity and magnetism	3l, 1T/P

Logical exposition of fundamental principles and the development of problem solving skills are addressed.
Mechanics: Momentum, collisions, rotation, gravitation, oscillations, waves.
Thermodynamics: Temperature, heat, first law of thermodynamics, kinetic theory of gases, entropy, second law of thermodynamics.
Electricity and magnetism: Gauss's law, capacitance, magnetic field, Ampere's law, induction and inductance, simple alternating current circuits.

One examination paper of two hours.

PHYS1534	16	5	CESM: 140101	NSC PS at least level 4 or successful completion of BSc Extended first year	Mechanics, optics, electricity, biologically and medically relevant topics	3L

Applications of physics in biology and medicine are discussed in this module.
Mechanics: Revision of the elementary concepts: displacement, velocity, acceleration, force, work, energy, power. Treatment of the above without calculus.
Geometrical optics: The electromagnetic spectrum, plane mirrors, spherical mirrors, image formation, thin lenses, optical instruments.
Electricity: Electrical charge, electrical field, electrical potential, current, resistance, circuits.
Biologically and medically relevant topics: Physical principles of apparatus used in biology and medicine, some applications of physics in these fields.

One examination paper of two hours.

PHYS1644	**16**	**5**	**CESM: 140101**		**Mechanics, thermodynamics, electricity, magnetism, biologically and medically relevant topics**	**3L,1T/P**
Applications of physics in biology and medicine are discussed in this module. Mechanics: Momentum, collisions, rotation, gravitation, oscillations, waves. Thermodynamics: Temperature, heat, first law of thermodynamics, kinetic theory of gases, entropy, second law of thermodynamics. Electricity and magnetism: Gauss's law, capacitance, magnetic field, Amperé's law, induction and inductance, simple alternating current circuits. Biologically and medically relevant topics: Physical principles of apparatus used in biology and medicine, some applications of physics in these fields.						One examination paper of two hours.
PHYS2614	**16**	**6**	**CESM: 140101**	**PHYS1514/1534, PHYS1624/1644, MATM1624/1644**	**Mechanics, waves and optics**	**3L**
Much of physics and engineering demands a thorough knowledge of vibrating systems and wave behaviour. After a review of Newtonian dynamics, it is applied to systems experiencing a restoring force, leading to simple harmonic motion. This theory is generalized to the cases of damped and driven oscillators. The wave equation is derived, and standing waves, as well as the reflection and transmission of waves are explained. Polarization, interference and diffraction of light, illustrating its wave nature, are then discussed.						One examination paper of three hours.
PHYS2624	**16**	**6**	**CESM: 140101**	**PHYS1514/1534, PHYS1624/1644, MATM1534/1644**	**Electronics**	**2L, 1P**
Electronics: Properties of semiconductors, diodes, rectifier circuits, zener diodes, power supplies, transistors, transistor amplifiers, operational amplifiers, operational amplifiers in feedback circuits, timer circuits, digital circuits and, computers ports. Practical work in electronics: Diodes, power supplies, transistors, operational amplifiers in feedback circuits, timer circuits, digital circuits and computers control. A project and seminar.						One examination paper of three hours.
PHYS2632	**16**	**6**	**CESM: 140101**	**PHYS2614 previously, otherwise they must be registered together.**	**Practical work: Physics**	**2L, 1P**
Practical work on oscillations, waves and optics: experiments with mechanical oscillators, light interference, and computer simulations of waves and Fourier analysis.						One practical session of 5 hours per week during the first semester.
PHYS2642	**8**	**6**	**CESM: 140101**	**MATM2614. The student should have passed PHYS2614.**	**Electromagnetism**	**2L**
The electromagnetic force is one of the four fundamental forces in nature. It dominates the interaction of matter on the atomic scale and governs the behaviour of the full spectrum of electromagnetic waves.						One practical session of 5 hours per week during the first semester.
PHYS3714	**16**	**7**	**CESM: 140101**	**PHYS1624**	**Modern Physics**	**3L**
Special relativity: Galilean and Lorentz transformations, length contraction, time dilation, relativistic Doppler shift and aspects of relativistic mechanics. Particle properties of waves: Black-body radiation, photo-electric effect, Compton effect, gravitational red and blue shift, Mössbauer effect and applications. Wave properties of particles: Electron diffraction, de Broglie waves, probability waves, Heisenberg's uncertainty principle. Introductory quantum physics: Schrödinger's equation, one dimensional potential well, quantum mechanical tunnelling and its applications, hydrogen atom, orbital angular momentum and electron spin, Zeeman effect and applications. Nuclear Physics: The atomic nucleus, radioactivity, quantum mechanical treatment of alpha-decay, nuclear fission and fusion reactions, reaction rate, neutron transport in reactors.						One examination paper of three hours.
PHYS3724	**16**	**7**	**CESM: 140101**	**PHYS3714**	**Solid-state Physics**	**3L**
Structure of solids: Crystallography: crystal planes, crystal lattice, reciprocal lattice, Defects: point defects, dislocations, X-ray diffraction. Lattice dynamics: Lattice vibrations: Einstein and Debye models, normal modes and density of states, thermal properties, Brillouin zones. Free electron model: Electrical and thermal conduction, Fermi level, Hall effect. Periodic Potential: Band theory: nearly free electron and tight binding approach.						One examination paper of three hours.
PHYS3732	**8**	**7**	**CESM: 140101**	**PHYS1624**	**Statistical Physics I**	**1L**
Phase space, distribution function, the most probable distribution, Lagrange multipliers, Boltzmann distribution, degeneracy of energy levels, the Maxwell-Boltzmann velocity distribution, the Maxwell-Boltzmann speed and energy distributions, the derivation of the equation of state of an ideal gas using the Maxwell-Boltzmann distribution, paramagnetism. Applications in terms of transport processes like effusion and diffusion, derivation of the hydrodynamic equations of motion of gases and fluids, heat conduction, propagation of sound waves, and viscosity.						One examination paper of two hours.

PHYS3742	**8**	**7**	**CESM: 140101**	**PHYS3732**	**Statistical Physics II**	**1L**
Quantum statistics, the Fermi-Dirac and Bose-Einstein statistics and distributions, the equation of state of a quantum gas, Fermi temperature, low-temperature properties of a degenerate gas, the degenerate electron gas, valence and conduction bands in semiconductors, degenerate gases in astrophysics: white dwarfs and neutron stars, Blackbody radiation, the photon gas, stimulated emission, Debye specific heat, electron specific heat.					One examination paper of two hours.	
PHYS3752	**8**	**7**	**CESM: 140101**	**PHYS2632 (with PHYS3714 and PHYS3732)**	**Practical work: Physics**	**1P**
Practical work on phenomena that are explained by modern physics, as well as a few experiments in statistical physics and thermodynamics.						
PHYS3762	**8**	**7**	**CESM: 140101**	**PHYS2632 (with PHYS3724 and PHYS3742)**	**Practical work: Physics**	**1P**
Practical work on phenomena that are explained by solid state theory as well as a few experiments in statistical physics and thermodynamics.						

13.5 DEPARTMENT OF COMPUTER SCIENCES AND INFORMATICS

- Computer Literacy: CSIQ1531and CSIQ1541 are compulsory if the programme prescribes it and the student did not pass the promotion test at the beginning of the semester. If the student passes the promotion test, he/she will receive a mark which will appear on his/her study record. Students, who passed grade 12 Information Technology (IT) on performance level 5(60%), or Computer Application Technology (CAT) on performance level 6 (70%), are exempted from CSIQ1531.
- It will be expected from BSc (IT) students to do at least one student assistantship in the Department of Computer Science and Informatics in the second or third year of study.
- The contents of CSIL1521 and CSIQ1541 are the same.
- **Modules in () indicate equivalent modules on main campus**

CSIQ1531 (CSIL1511)	**4**	**5**	**CESM: 060599**	**None**	**Computer Literacy: Part 1**	**1L, 3P**
A basic knowledge of the principles of microcomputers and microcomputer hardware, the basic commands of the operating system, a general word processing program, a spreadsheet program, presentation program and the internet. The student must also be able to apply the knowledge.					Continuous evaluation; no special examinations will be granted.	
CSIQ1541	**4**	**5**	**CESM: 060599**	**CSIQ1531**	**Computer Literacy: Part 2**	**1L, 3P**
Basic commands of a database program, as well as advanced commands of a general word processing program, a spreadsheet program and a presentation program. The student must also be able to apply the knowledge.					Continuous evaluation; no special examinations will be granted.	
CSIQ1512	**8**	**5**	**CESM: 060599**	**With CSIQ1533**	**Computer Literacy for Computer Science**	**2L, 3P**
This module introduces the learner to the world of computers. The course is aimed at computer science students who have little or no background of computers and their functionality. The course covers basic computer literacy including programmes commonly used on a day to day basis in industry such as Microsoft Windows and Office. Learners also get the opportunity to explore common communication environments. The course prepares the learners to search for information and stay abreast with current trends in the computing arena.					This is not a promotion module. One examination paper (written and/or practical) of three hours.	
CSIQ1533	**12**	**5**	**CESM: 060103**	**With CSIQ1512**	**Introduction to Software Development Concepts**	**3L, 3P**
This module introduces the core concepts of writing computer programs - variables, decisions, loops, functions, and objects - which apply regardless of the programming language, but uses concrete examples and exercises in the dynamic environment to apply and reinforce these concepts. The course is aimed at students who have little or no background of computers and their functionality. The course prepares the learner to think logically before delving into complex programming concepts. The use of visual code-less programming tools will be used.					This is a promotion module. One examination paper (written and/or practical) of three hours.	
CSIQ1553	**12**	**5**	**CESM: 060103**	**None**	**Introduction to Computer Hardware**	**3L, 3P**
This module introduces the learner to computer hardware components. The course is aimed at computer science students who have little or no background of computers and their functionality. The course covers computer hardware from the basic terms, assembly, configuring through to troubleshooting and computer hardware's integration with software.					This is a promotion module. One examination paper (written and/or practical) of three hours.	
CSIQ1614	**16**	**6**	**CESM: 060201**	**With CSIQ1512**	**Introduction to Software Development Concepts**	**3L, 3P**
This module deals with the professional implementation of computerised solutions in an object-oriented, high-level programming environment. The module provides an introduction to problem solving, algorithms, classes, objects, properties and methods. Control structures, e.g. selection and iteration, and input and output are also covered.					This is a promotion module. One examination paper (written and/or practical) of three hours.	

CSIQ1623	**12**	**6**	**CESM: 060801**	**CSIQ1512 + CSIQ1553**	**Introduction to Computer Networks**	**3L, 3P**
This module introduces the learner to the theory and practical aspects of computer networks. The course is aimed at computer science students who have a background with computers and their functionality. The course covers computer networks topics which include computer networks concepts, organisation, topologies, hardware, media, OSI Model, TCP/IP suite, addressing and basic troubleshooting.					This is a promotion module. One examination paper (written and/or practical) of three hours.	
CSIQ1624	**16**	**6**	**CESM: 060201**	**CSIQ1534 + CSIQ1531**	**Programming and Problem Solving: Part 2**	**3L, 3P**
This module deals with information systems and problem solving in business and scientific environments. Advanced object oriented concepts, debugging, storing data in files and access to simple databases.					One examination paper (written and/or practical) of three hours.	
CSIQ1681	**6**	**4**	**CESM: 060201**	**CSIQ1533**	**Introduction to Software Development: Part 2**	**3L, 3P**
This module deals with the introduction of the core concepts of writing computer programs - Defensive programming, GUI development and Enumerations and Collections - that apply regardless of the programming language, but concrete examples and exercises in the dynamic environment to apply and reinforce these concept.					Continuous assessment is applied in this module and no special examinations are allowed.	
CSIQ2614	**16**	**6**	**CESM**	**CSIQ1644**	**Data Structures and Advanced Programming**	**3L, 3P**
This module deals with advanced programming that requires an understanding of data structures and the professional implementation thereof.					One examination paper (written and/or practical) of three hours.	
CSIQ2624	**16**	**6**	**CESM : 060302**	**CSIQ1624**	**Human-Computer Interaction**	**2L,3P**
If the potential computer user is not accommodated throughout the design process of a computer system, the system will not be used and money and energy will be wasted. This module provides the user with an introduction to Human-Computer Interaction (HCI). Aspects that are covered include usability, human factors, models of interaction, data collection, the design of user interfaces, visual interfaces and the evaluation of interfaces; types of interfaces, mobile HCI.					This is a promotion module. One examination paper (written and/or practical) of three hours	
CSIQ2642	**8**	**6**	**CESM : 060501**	**CSIQ1531+ CSIQ1541**	**Information Technology Service Learning**	**E/A**
This module enables the students to serve the community by ploughing back the IT knowledge gained during their studies. While serving the community the students will learn how to work with people with varying computer literacy skills or levels. By teaching or helping others, their own knowledge will be expanded.					Continuous assessment is applied in this module and no special examinations are allowed.	
CSIQ2634	**16**	**6**	**CESM: 060702**	**CSIQ1624**	**Databases and Database Management Systems 1**	**2L, 3P**
This module deals with database concepts, design and implementation concepts, transaction management and concurrency control, distributed database management systems, object-oriented databases and database programming. There will be operations on databases such as SQL queries, ER diagrams and ADO.NET.					This is a promotion module. One examination paper (written and/or practical)	
CSIQ2654	**16**	**6**	**CESM: 060904**	**CSIQ1624**	**Introduction to Websites Development**	**2L, 3P**
This module introduces the learner to developing web sites. The development of good web pages requires that the programmer has knowledge of various web aspects and technologies. This includes the working of the Internet, graphical interfaces, Internet protocols, web page development with XHTML, HTML5, and CSS. JavaScript will also be introduced.					This is a promotion module. One examination paper (written and/or practical)	
CSIQ2624	**16**	**6**	**CESM: 060302**	**CSIQ1624**	**Human Computer Interaction**	**2L, 3P**
This module provides the student with an introduction to Human-Computer Interaction (HCI). Aspects that are covered include usability, human factors, interaction models, data collection, designing user interfaces, visual interfaces and the evaluation of interfaces, types of interfaces and HCI for mobile devices.					This is a promotion module. One examination paper (written and/or practical) of three hours.	
CSIQ2644 (2016)	**16**	**7**	**CESM : 060299**	**CSIQ2634**	**Mobile Development**	**2L,3P**
Theory and practical applications of new mobile technologies, which will be adapted on a yearly basis. Principles of mobile applications programming, mobile programming, publishable applications.					This is not a promotion module. One examination paper (written and/or practical)	
CSIQ3714	**16**	**7**	**CESM : 060702**	**CSIQ2634**	**Introduction to Databases and Database Management Systems: Part 2**	**2L,3P**
This module deals with advanced database concepts, advanced queries, optimising queries, distributed databases, cloud computing and administrative tasks related to data and database management. The module also provides an introduction to data warehousing and OLAP.					This is not a promotion module. One practical examination (written and/or practical).	

CSIQ3724	**16**	**7**	**CESM : 060401**	**CSIQ2644**	**Software Engineering**	**2L,3P**
This module introduces students to large scale software development utilising software design, implementation and maintenance.					This is not a promotion module. One examination (written).	
CSIQ3734	**16**	**7**	**CESM : 060904**	**CSIQ2614 and CSIQ2634**	**Internet Programming**	**2L,3P**
Students will learn essential web development skills related to current Internet technologies and protocols, web graphics and multimedia, web authoring and design, and web programming. Appropriate programming languages will be used for server-side programming.					This is not a promotion module. One practical examination (written and/or practical).	
CSIQ3784	**16**	**7**	**CESM: 060401**	**CSIQ2644**	**Software Development Project**	**2L,3P**
The students will experience the process of the system life cycle and will develop the information system by following an iterative incremental development. Students will be expected to formulate a scenario for their chosen topic and develop an information system to meet the client's requirements.					Continuous assessment of a computer project.	
CSIQ6809	**36**	**8**	**CESM: 060202**	**Qualifying for BSc Hons**	**Computer Information Technology Project**	**1L, 3P**
The development of a complete working computer project to solve a real life or theoretical problem.					Continuous assessment of a computer project.	
CSIQ6833	**12**	**8**	**CESM: 060302**	**Qualifying for BSc Hons**	**Human-Computer Interaction**	**1L, 3P**
Theoretical background and practical experience in Human-Computer Interaction, with specific emphasis on Usability Engineering. The module provides an in-depth knowledge and understanding of issues involved in the evaluation of user interfaces for interactive computer systems.					Continuous assessment	
CSIQ6823	**12**	**8**	**CESM: 060299**	**Qualifying for BSc Hons**	**Advanced Mobile Development**	**1L, 3P**
This module deals with advanced mobile development concepts, advanced user interface and components, compatibility, mapping and location based services, server-side programming, client access to software agent system, connectivity and testing strategies.					Formative practical assessment, assignments and two formal semester tests a final summative assessment,	
CSIQ6853	**12**	**8**	**CESM: 060299**	**Qualifying for BSc Hons**	**Gamification**	**1L, 3P**
Gamification is the concept of applying game mechanics and game design techniques to engage and motivate people to achieve their goals. It is the application of game-design elements and game principles in non-game contexts.					Formative practical assessment, assignments and two formal semester tests a final summative assessment,	
CSIQ6863	**12**	**8**	**CESM: 061001**	**Qualifying for BSc Hons**	**IT Project Management**	**1L, 3P**
Basic principles of Project Management, including: the differences between Project Management and IT Project Management, how to perform as a Project Manager and to be part of a project team in al the 9 knowledge areas of Project Management, using a Project Management software tool in order to manage an IT project.					Formative practical assessment, assignments and two formal semester tests a final summative assessment,	

13.6 DEPARTMENT OF GEOGRAPHY

GEOE1514	**16**	**6**	**140501**	**NSC MATHEMATICS LEVEL Level 3**	**INTRODUCTION TO PHYSICAL GEOGRAPHY**	**3L, 3P**
Universe, Solar System, Earth, Climatology, Hydrogeography, soil geography, weathering and erosion, geomorphology, environmental geography. Practicals: Elementary cartography and the representation, interpretation of Environmental Data.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOE1624	**16**	**6**	**140501**	**GEOE1514**	**INTRODUCTION TO HUMAN GEOGRAPHY**	**3L, 3P**
The Module is concerned specifically with human Settlement. It deals with Population dynamics, Development of rural and Urban Settlements, Urbanization, Agriculture, flows and networks and economic Geography					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	

GEOG1514	**16**	**6**	**140501**	**For BSc Geography NSC MAthematics Level 5 For BA Geography and BEd Geography NSC Mathematics Level 4**	**INTRODUCTION TO PHYSICAL GEOGRAPHY**	**3L, 3P**
Universe, Solar System, Earth, Climatology, Hydrogeography, soil geography, weathering and erosion, geomorphology, environmental geography. Practicals: Elementary cartography and the representation, interpretation of Environmental Data.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG 1624	**16**	**6**	**140501**	**GEOG1514**	**INTRODUCTION TO HUMAN GEOGRAPHY**	**3L, 3P**
The Module is concerned specifically with human Settlement. It deals with Population dynamics, Development of rural and Urban Settlements, Urbanization, Agriculture, flows and networks and economic Geography					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOT1624	**16**	**6**	**140504**	**NSC**	**TOURISM GEOGRAPHY**	**3L,1T**
The aim of the module tourism geography is to introduce students to the geographical distribution of tourism, travel patterns, and the impact of tourism on the natural environment, economics and social behaviour of local communities and destinations.					Formative & summative, Tests & assignments & projects.	
GEOG2614	**16**	**6**	**140501**	**GEOG1514 or GEOE1514**	**PROCESS GEOMORPHOLOGY AND GEOMORPHOLOGICAL HAZARDS**	**3L, 3P**
The module focus on earth surface process and hazards, Introduction to Geomorphological and geological phenomena, waves and ocean phenomenon as important geomorphic agent of erosion in the coastal zone. Fluvial Geomorphology and its application to the environment, Aeolian geomorphology and its application to the environment.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG2634	**16**	**6**	**140501**	**GEOG 1624 or GEOE1624**	**URBAN DEVELOPMENT STUDIES**	**3L, 3P**
The module focus on central Theme of Society and Space including components of development, theoretical framework and criteria of measuring development, spatial models, intra-urban structures, urbanization and its impacts on physical and social environment, problems and challenges of first and third world, housing and services. Practicals: collection and preparation of data, statistical principles of application in in spatial analyses, interpretation of results					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GISS2614	**16**	**6**	**140501**	**CSIQ 1531 & GEOG 1514 or GEOE1514**	**INTRODUCTION TO REMOTE SENSING**	**3L, 3P**
A brief History of Remote Sensing for Earth observation (Photogrammetry and aerial photography), Physical laws of Remote Sensing and Energy Interactions (Electromagnetic Radiation), Evolution of Platforms and Characteristics of Remote Sensing Sensors (Resolutions), Remote sensing Data collection and Process, Satellite based sensors, Multispectral Remote Sensing (Visible and Infrared Remote sensing), Hyperspectral Remote Sensing, Active Sensor Remote Sensing, Lidar Remote Sensing, Radar Remote Sensing, GIS integration, Remote Sensing Applications					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOT2614	**16**	**6**	**140504**	**GEOT1624**	**GLOBAL TOURISM STUDIES**	**3L,1T**
The aim of this module is to introduce students to the basic concepts and systems underlying scientific tourism studies. It also defines the concept tourist, different types of tourists, the reasons why visitors travel and the different experiences that enhance the tourism industry.					Formative & summative, Tests & assignments & projects.	
GEOG2624	**16**	**6**	**140501**	**GEOG1514 or GEOE1514**	**ENVIRONMENT AND CLIMATE STUDIES**	**3L, 3P**
The module gives the background of environmental sciences starting from the basics of science, it looks at different materials that are found in different ecosystems including biodiversity and natural process. Other studies include, Economy and the environment, water sources, pollution and solid waste, human benefit and impacts as a result of resource extraction.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	

GEOG2644	**16**	**6**	**140501**	**GEOG 1514 or GEOE1514**	**BIOGEOGRAPHY AND CLIMATE OF SOUTHERN AFRICAN**	**3L, 3P**
Introduction to biogeography of Southern Africa, Historical pattern of Vegetation distribution in Southern Africa, Southern Africa Biomes, Biodiversity and Conservation in Southern Africa, Environmental Impacts on Vegetation of Southern Africa, Basic concept and general climate of Southern Africa, Weather Producing Systems of Southern Africa, Severe weather events of Southern Africa, Climate Variability, Change and its impact.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GISS2624	**16**	**6**	**140501**	**CSIQ 1531 & GEOG 1514& MATHS NSC LEVEL 5 or MATD1564 or GEOE1514**	**INTRODUCTION TO GEOGRAPHICAL INFORMATION SYSTEM**	**3L, 3P**
Theoretical framework of GIS, data structure and databases, collection and verification of data with spatial analysis. Presentation of information with the aid of GIS. Identification of features and measurement on GIS platform.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOT2624	**16**	**5**	**140504**	**GEOT2614**	**PRIMARY AND SECONDARY ASPECTS OF TOURISM STUDIES**	**3L,1T**
The aim of this module is to build on and improve the knowledge on basic concepts and systems underlying the development of the tourism industry. The content also emphasises the role of the following industrial sectors in the promotion tourism at national and international level; the transport industry, accommodation and catering sector, natural and cultural attractions.					Formative & summative, Tests & assignments & projects.	
GEOG3714	**16**	**7**	**140501**	**GEOG2614**	**ENVIRONMENTAL GEOMORPHOLOGY**	**3L, 3P**
The module aims to familiarize students with the role of geomorphology as a significant branch of earth sciences. Students are familiarized with the development of nineteenth, twentieth and twenty first century geomorphology, the move towards process-oriented studies and new methodologies (micro-geomorphology), Southern African Geomorphology and the Quaternary of Southern Africa, Geomorphology of semi-arid and arid southern Africa, Including free state.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG3734	**16**	**7**	**140501**	**GEOG2634**	**APPLIED URBAN DEVELOPMENT AND SPATIAL TRANSFORMATION**	**3L, 3P**
Geography of apartheid, inequality and post-apartheid, spatial transformation of urban areas, changing urbanization process and patterns, spatial integration of the former homelands, geography of inequality on national, regional and local level. Spatial transformation of urban areas, its future challenges and solution. Urbanization and urban growth as spatial processes, challenges associated with fast growing cities.					Formative assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOT3714	**16**	**7**	**140504**	**GEOT3714**	**TOURISM DEVELOPMENT AND POLICY**	**3L**
This module aims to introduce the student to different theories of development and to emphasise the relationship between tourism and development. The study includes concepts of pro-poor tourism and responsible tourism.					Formative & summative, Tests & assignments & projects	
GEOG3724	**16**	**7**	**140501**	**GEOG2634**	**RURAL GEOGRAPHY**	**3L,2P**
This module aims to provide an introduction to rural development issues globally, it investigates the sustainable development of rural areas, the impact of migration on the development of rural areas, poverty as it manifest itself in different forms of rural areas, how poverty can be reduced in rural areas and rural – urban linkage.					Formative assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG3744	**16**	**7**	**140501**	**GEOG2624**	**ENVIRONMENTAL MANAGEMENT AND ANALYSIS**	**3L,3P**
The South African Environment and Processes, Systems in the Environment, Environmental Management Plans, Integrated Environmental Management procedures, environmental impact analyses					Formative assignments and two formal semester tests a final summative assessment, examination of 3 hours.	

GEOT3744	**16**	**7**	**140504**	**GEOT2624**	**TOURISM AND LOCAL DEVELOPMENT IN SOUTH AFRICA**	**3L,1T**
The aim of the module is to assist students to recognise and understand the important role of tourism in Local Economic Development in South Africa. The emphasis is on the presence and or absence of pro-poor tourism development programmes, plans and projects in the South African context.					Formative & summative, Tests & assignments & projects	
GISS3724	**16**	**7**	**140501**	**GISS2624**	**GEOGRAPHICAL INFORMATION SCIENCE**	**3L, 3P**
Geographical data and the computer, data collection and data acquirement, data verification, quality control, raster data models, vector data models, interpolation, spatial analysis and spatial modelling, errors, the management of a GIS. Application programmes, data digitising, topology, data processing, removing of errors, digital image processing as data source, representation of information, report writing.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	

GEOT3734	**16**	**7**	**140504**	**GEOT2624**	**Tourism Cultural Studies**	**3L,1T**
The aim of the module is to provide students with the theoretical framework to understand cultural tourism in the broader context of heritage studies. Students are introduced to the most important cultural historical activities in South Africa, with a specific focus on conserving cultural tourism in practice.					Formative & summative, Tests & assignments & projects	
GEOT3724	**16**	**7**	**140504**	**GEOT3734**	**Nature Tourism Studies**	**3L,1T**
The aim of this module is to introduce various policies, institutional and management practices that can enhance nature tourism's contribution to biodiversity conservation, economic and community development. The focus is on those tourist experiences that are related to natural attractions and includes ecotourism, adventure tourism, wildlife tourism and nature retreats.					Formative & summative, Tests & assignments & projects	

GEOG3754	**16**	**7**	**Not Sure**	**GEOG2634**	**ECONOMIC GEOGRAPHY**	**3L, 1P**
Concept of Economic Geography, Key approaches in economic geography, Key concepts and theories: wealth, value and circuits of capital; factors of production; agriculture, manufacturing and services; neo-classical equilibrium; core-periphery theories of economic change, Geographies of economic globalisation in agriculture, manufacturing and services. Governing globalisation. Trans-national and multi-national corporations Global finance. Urban and Regional Economic growth and decline with emphasis on environmental quality, Geographic Perspectives on Sustainable Economic growth and development.					Assignments, Essay and two formal semester tests a final summative assessment, examination of at least 2 hours.	
GEOG3764	**16**	**7**	**Not sure**	**GEOG1624**	**ETHICAL DEBATES IN GEOGRAPHY**	**3L, 3P**
A review of major environmental issues and the role of various actors in addressing environmental problems, Framing environmental debates. Identifying major themes in environmental discourse, Anthropocentrism vs. Biocentrism, Sovereignty vs. Global Commons, Resource use/Development vs. Conservation, Sustainable development and Natural Resource Management,Fracking in South Africa; Good or Bad The Climate Debate, Pros and cons of Carbon trading, Alternate Energy: proponents and opponents					Assignments, Essay and two formal semester tests a final summative assessment, examination of at least 2 hours.	

GEOG6808	**32**	**8**	**14501**	**Selection for honours**	**RESEARCH IN GEOGRAPHY**	**2B**
This course advances a framework for designing a research study in Geography. This process includes deciding on a paradigm; using literature; writing an introduction; stating a purpose for the study; identifying research questions and hypotheses; using theory; defining, delimiting and stating the significance of the study and advancing methods and procedures for data collection and analysis. The objective of this course is to guide the research student through this process in a structured manner. The course is divided into a number of seminars that will entail a presentation by a number of staff members. These theory presentations are followed by a discussion of the practical considerations the student will need to think through to successfully complete the final year-end project. In addition, there are four report back sessions during which students will make a 10-minute presentation to both staff and fellow research students on the progress he/she has made in the chosen field of investigation. This presentation also provides the opportunity for both staff and fellow students to ask questions, as well as make suggestions, relating to the research. The course culminates in the presentation of a research report that is a compulsory element of the Honours degree in Geography					4 seminars presentation with continuous assessment and feedback and a final research report	

GEOG6816	**24**	**8**	**14501**	**Selection for honours**	**THEORETICAL FOUNDATIONS OF GEOGRAPHY**	**3L, 1P**
The module aims to familiarise students with philosophy in general, and the philosophy of geography in particular. It starts with a brief introduction to philosophy in general, the universe around us, and the general ethics behind scientific enquiry and research. It proceeds to examine the development of geographical thought and the evolution of the discipline. Conceptions in geography from the late seventeenth century, through positivism and into post modernism are assessed and evaluated.					Mini Project and two formal semester tests a final summative assessment, examination of at least 2 hours.	
GISS6824	**16**	**8**	**140501**	**Selection for honours**	**ADVANCE REMOTE SENSING (not presented in 2018)**	**3L, 3P**
Remote Sensing data Acquisitions, Digital image processing systems and image display and visualization, Image preprocessing: Radiometric and Geometric corrections, Image Enhancements, Pattern Recognition, Accuracy Assessments and Change Detection, Special Topics in Remote Sensing: Lidar Remote Sensing and Hyperspectral Remote Sensing, Applications of Remote Sensing: Agriculture, Global Vegetation, Forestry, Biodiversity, Water Resources					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG6836	**24**	**8**	**140501**	**Selection for honours**	**APPLIED GEOMORPHOLOGY**	**3L, 2P**
Applied geomorphology in the context of land management in the Free State, in particular aeolian processes, and wind erosion and its impacts on the Free State's landforms and agricultural base.					Formative assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG6824	**16**	**8**	**140501**	**Selection for honours**	**SUSTAINABLE NATURAL RESOURCE MANAGEMENT**	**3L, 1P**
Overview of the principles of interdisciplinary natural resource management, Resource and Environmental Management Policy (Energy, Soil, Water, Forest, Biodiversity, Mineral). Sustainable development and Natural Resource Management,Sustainability, Economics, and Natural Resources, Natural Resources Administration and Law, The Role of Information Management in Sustainable Resource Use, Human Dimensions of Natural Resources and Environmental Management, Ecological Dimensions of Resource and Environmental Management, Exploring Natural Resource Case studies: Examples					Mini Project and two formal semester tests a final summative assessment, examination of at least 2 hours.	
GEOG6814	**16**	**8**	**140501**	**Selection for honours**	**INTERMEDIATE GEOGRAPHIC INFORMATION SYSTEMS**	**3L 3P**
At an intermediate level, the module aims to provide a working knowledge of GIS to students with little or no previous experience of the science After successful completion of the module, the student should have a thorough knowledge of the basic principles of Geographic Information Systems and be able to do simple data import, processing, analyses and presentation on a computer. The student will have basic cartographic and surveying skills; be able to identify features on photographs; and have basic knowledge of satellite images and image processing.					Formative practical experiment, assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG6846	**24**	**8**	**140501**	**Selection for honours**	**INTEGRATED ENVIRONMENTAL MANAGEMENT**	**3L P**
Integrated environmental management (history, issues and challenges). Water and wastewater management issues. Land contamination management issues. Solid waste management issues. Air quality and noise pollution management issues. Industrial ecology. Environmental health and safety. Environmental economics. Environmental impact assessment. Environmental management master plan development.					Formative assignments and two formal semester tests a final summative assessment, examination of 3 hours.	
GEOG6826	**24**	**8**	**140501**	**Selection for honours**	**ENVIRONMENTAL POLICY AND PRACTICE**	**3L**
The course examines various environmental policy and the implications these have on environmental management. This course will introduce students to the main theories and practices pertaining to the environment and consider the implications of environmental practices for environmental policy, planning and decision making, and develop the nexus between theory and practice in environmental decision making contexts. Case studies from across the world will be considered, and highlight how issues of equity, justice, and other ethical dimensions are part of environmental planning and policy and will highlight how practices can shape environmental planning and policy in different domains - from global (climate change) to local (NRM or coastal management) contexts.					Formative assignments and two formal semester tests a final summative assessment, examination of 3 hours.	

13.7 MATHEMATICS AND APPLIED MATHEMATICS

MATD1554	**16**	**4**	**CESM**	**National Senior Certificate (NCS) Mathematics on performance level 3 (40%)**	**Basic Mathematics**	**3L, 5T**
Development of skills with arithmetic and mathematical calculations. Real numbers, algebraic expressions. Algebraic and graphical solution of equations. Logarithms and exponents. The use of a pocket calculator. Basic geometry and elementary trigonometry, the calculation of areas and volumes. Simple and compound interest. Grouping of data and descriptive statistics.						Tutorials, homework, class/ tutorial/semester tests, and one three-hour paper.
MATD1564	**16**	**5**	**CESM**	**National Senior Certificate (NCS) Mathematics on performance level 4 (50%)**	**Precalculus II**	**4L, 3P**
Algebra overview. Functions and graphs. Algebraic, linear, quadratic and polynomial functions. Trigonometric functions and trigonometry. Exponential and logarithmic functions.						Tutorials, tutorial/semester tests, and one three-hour paper.
MATM1534	**16**	**5**	**CESM**	**Mathematics on performance level 5 (60%) or WTW164/MATD1564**	**Calculus**	**3L, 3T**
Functions, graphs, limits, continuity and the derivative. Polynomial, trigonometric, exponential and logarithmic functions. Differentiation. Critical points and local maxima and minima. Introduction to modelling. The definite integral. Integration techniques.						Tutorials, tutorial/semester tests, and one three-hour paper.
MATM2614	**16**	**6**	**CESM**	**MATM1614 & minimum 40% in MATM1624**	**Vector analysis**	**2L, 2P**
Vector functions: limits, derivatives and integrals. Curves: parameterization, tangent vectors, arc length. Multivariable functions: quadratic surfaces, partial derivatives, limits, continuity, differentiability, gradients and directional derivatives, the Mean Value theorem, the chain rule for partial derivatives, tangent planes. Multiple and line integrals: Theory and applications.						Tutorials, tutorial/semester tests, and one three-hour paper.
MATM2624	**16**	**6**	**CESM**	**minimum 40% in MATM1614 or MATM1534 and minimum 40% in MATM1614**	**Linear algebra**	**2L, 2P**
Real vector spaces: basis, dimension, subspace. Linear mappings: kernel, image, representation of a linear mapping as a matrix, inverse. Inner product and orthogonality: orthogonal bases, rank, bilinear mappings, quadratic forms. Determinants. Eigenvalues and eigen-vectors: characteristic polynomial of a linear mapping, symmetric matrices, diagonalisation. The Cayley-Hamilton theorem.						Tutorials, tutorial/semester tests, and one three-hour paper.
MATM2664	**16**	**6**	**CESM**	**MATM1614 and MATM1624**	**Sequences and series**	**3L, 2P**
Sequences of real numbers: convergence, limits, boundedness, indeterminate forms, L'Hospital's rule. Improper integrals. Infinite series: tests for convergence, absolute and conditional convergence. Taylor series. Power series: intervals of convergence. Fourier analysis						Tutorials, tutorial/semester tests, and one three-hour paper.
EBCS1514	**16**	**5**	**CESM 041002**	**Equivalent modules: EBCS1514**	**Introduction to Statistics (I)**	**3L, 3T**
Elementary calculations, Interest calculations, Index numbers, Time series, Introduction to statistics, and, collection of data						This is a promotion module (70%), Semester mark (50%): assignments (50%), two semester tests (50%), Examination mark (50%): one three-hour exam paper.
EBCS1524	**16**	**5**	**CESM 150301**	**Equivalent module: EBCS52405**	**Introduction to Statistics (II)**	**3L, 3T**
The organising, graphical presentation and description of data, Elementary principles of probability, Confidence intervals and hypothesis testing, Correlation and regression, Contingency tables, analysis of variance						This is a promotion module (70%), Semester mark (50%): assignments (50%), two semester tests (50%), Examination mark (50%): one three-hour exam paper.
MATA2654	**16**	**6**	**CESM 041002**	**MATM1644/1544 – 60% or MATM1624 – 50%**	**Ordinary differential Equations**	**2L, 2T**
Non-linear first order differential equations: substitution techniques, exact equations, in¬tegration factors. Non-homogeneous second order differential equations with constant coefficients. Series methods. Systems of linear first order differential equations. Elementary eigenvalue pro¬blems. Applications in Physics, Chemistry, Biology and Medical Science such as mixtures, mechanical vibrations, electronic circuits and resonance pro¬blems.						
MATM3714	**16**	**7**	**CESM0150101**	**MATM2614 & MATM2664**	**Complex Analysis**	**2L,3T**
The complex numbers. Functions of a complex variable. Limits, continuity and differentiability. The Cauchy-Riemann equations. Power series. Analytic functions. Cauchy's theorem. Residue theory and applications.						Tutorials, tutorial/semester tests, and one three-hour paper

MATM3724	**16**	**7**	**CESM0150101**	**MATM2614 & MATM2664**	**Real Analysis**	**2L,3T**
Axiomatic construction of the real numbers. Sequences of real numbers. The Weierstrass-Bolzano theorem. Limits and continuity. The intermediate value theorem. The Riemann integral. Student should be able to: - Describe and prove the basic theory of the field of real numbers, including continuity, differentiablity and Riemann integrability.					Tutorials, tutorial/semester tests, and one three-hour paper.	
MATM3734	**16**	**7**	**CESM0150101**	**MATM2624 & MATM2664**	**Discrete Mathematics**	**2L,3T**
Predicate Logic, methods of proof, set theory, functions and relations, Division Algorithm, Pigeonhole Principle, elementary number theory, induction, effectivity of algorithms, combinatorics, graph theory. Student will be able to: - Describe the foundation of mathematics; - Show when sentences are logically equivalent; - Describe and use notions such as countability and infinity; and - Study and understand the theory of algorithms.					Tutorials, tutorial/semester tests, and one three-hour paper.	
MATM3744	**16**	**7**	**CESM0150101**	**MATM2624**	**Algebra**	**2L,3T**
Integers: Induction, greatest common divisors, well-ordering principle, equivalence relations, arithmetic modulo n. Groups: Finite and infinite groups, subgroups, cyclic groups, dihedral groups, permutation groups, Lagrange¿s theorem, cosets, conjunction, homomorphisms, isomorphism theorems. Rings: Commutative rings, rings with unity, integral domains, polynomial rings, fields, principle ideal domains, ideals, homomorphisms, fields of fractions of an integral domain, isomorphism theorems. Student will be able to: - Describe notions around certain algebraic structures such as groups, rings and fields; - Apply these notions; - Determine the possibility of certain geometric constructions; and - Study coding theory.					Tutorials, tutorial/semester tests, and one three-hour paper.	
The content of the following modules can be found in the EMS RULEBOOK						
EBUS1514	**16**	**5**	**CESM040101**		**Business functions**	**3L**
Introduction to management as well as the environments in which a business operates. Special focus will be given to eight management functions which include the following; Marketing, Financial Management, Human Resource Management, Operational Management, Logistics Management, Administration, Public Relations and General Management.						
EBUS1624	**16**	**5**	**CESM040101**		**General management**	**3L**
This module will enable students to gain insights into the nature of general management. The four management functions namely; planning, organising, leading and control will be investigated as well as related topics.						
EBUS1614	**16**	**6**	**CESM040101**		**Fundamental Business Functions**	**3L**
This module contains fundamental knowledge, theories and concepts of entrepreneurship, marketing and finance. It seeks to establish foundational knowledge regarding these three core management functions.						
EBMA2624	**16**	**6**	**CESM040101**		**Personal Selling**	**3L**
Personal Selling focuses on face-to-face interaction and personal communications between a seller and a buyer. By developing a relationship with a buyer, the seller uses the opportunity to specifically target needs and persuade decisions. Students will learn how to apply the knowledge in practice.						
EBUS2714	**16**	**5**	**CESM040101**		**Entrepreneurship**	**3L**
Introduction to Entrepreneurship, the entrepreneur and all the elements involved in identifying an opportunity. Special focus is given to the business plan and how to start a business.						

ESBM2724	**16**	**7**	**CESM 040101**		**Small Business Management**	**3L**
This module contains fundamental knowledge, theories, principles and practices of Small Business Management, including Marketing, Financial Management, Human Resource Management, Operational Management, Purchasing Management, Administration, Public Relations and General Management.						
EIOP1524	**16**	**5**	**CESM 181401**		**Introduction to individual differences**	**3L**
Industrial and Organisational Psychology - Introduction to Industrial and Organisational Psychology, - Frameworks for thinking and practice in Industrial and Organisational Psychology						
ECAP2614	**16**	**6**	**CESM 181402**		**Career Psychology**	**3L**
The module focuses on the meaning of work and career concepts. It further elaborates on the implications of changes in organisations for careers and applying career management models. This module will furthermore distinguish between the respective variables that impact on career choice and career development support. Lastly, the module will differentiate between various issues that have an impact on the career and career well-being.						
ELRM2624	**16**	**6**	**CESM 040801**		**Labour Relations Management**	**3L**
The aim of this module is to firstly provide the learner with a theoretical and practical framework of labour relations in the South African context. Secondly, to explain to the student the complexity of the labour relationship between individuals, organisations, unions and the state.						
EORG3715	**20**	**7**	**CESM 181401**		**Organisational Psychology**	**3L**
This module contains fundamental knowledge, theories, principles and practices of Organisational Psychology, including organisational behaviour which covers the following topics: Introduction to organisational behaviour Organisational culture Organisational design and structure Organisational development: Organisational change and innovation Group processes within the organisation: Groups and teams Communication Wellness and stress Power, empowerment and influence Managing conflict Decision making Leadership and followership						

EPFM3724	**16**	**7**	**CESM 181401**		**Performance Management**	**3L**
This module contains fundamental knowledge, theories, principles and practices of Performance management, including how to design and implement a successful performance management process.						
EECF1614	**16**	**6**	**CESM 040401**		**Economic systems and basic microeconomics**	**3L**
An introductory course to basic microeconomics in which the learner will develop the competency to demonstrate analytical skills in different fields of economics.						
EECF1624	**16**	**6**	**CESM 040401**		**Introduction to Macro-Economics**	**3L**
An introductory course that seeks to familiarize students with the concepts used in macroeconomic context as well as introduce them to the basic macroeconomic theory. The course puts a special emphasis on practical application so that students can relate the economic theory to the South African economy context.						
SOCP2624	**16**	**5**	**CESM 150301**			**3L**
This module focuses on the population-environment-development interface. Each of the three components are unpacked in this module, specifically with regards to how they interlink to disturb the balance between the social and the natural environments. More specifically the module addresses population change and its implications for the environment and development; the most significant environmental issues that humanity is confronted with; the impact that economic development is having on environmental and population change; the pursuit of environmental justice; and the endeavour towards a sustainable environment. Attention is given to the manifestation of this interface at the global level, with specific reference to developed and developing societies, as well as to the South African context.						