

2019

FACULTY OF  
Applied Sciences



creating futures



Cape Peninsula  
University of Technology

## DEPARTMENT OFFICE-BEARERS

POSITION	NAME	TELEPHONE	FAX	E-MAIL
Head of Department	Prof. FB Lewu	021 864 5213	021 864 5217	LewuF@cput.ac.za
Secretary	Ms A Bollitye	021 864 5217	021 864 5217	BollityeA@cput.ac.za

## ACADEMIC STAFF (PERMANENT)

POSITION	NAME	QUALIFICATIONS
<b>Professor &amp; Head of Department</b>	Prof FB Lewu	PhD Botany, MSc Agronomy, BSc Agriculture (Plant Breeding & Seed Technology)
<b>Associate Professor</b>	Prof FS Lategan	DTech Agric, MSc Extension and Rural Development, BSc Livestock Production
<b>Senior Lecturer</b>	Dr M Fanadzo	PhD Crop Science, MSc Agronomy, BSc Hons Agriculture
<b>Junior Lecturer</b>	Ms N Mfeka	MTech Agriculture, BTech Agriculture
<b>Lecturer</b>	Mr BF Saaiman	MInstAgrar Extension and Rural Development, BSc Agriculture (Agronomy)
<b>Lecturer</b>	Dr E Hough	PhD Agricultural Economics, Magister Agriculture. Bachelor Agriculture
<b>Lecturer</b>	Mr N Madolo	MScAgric (Animal Breeding and Reproduction) BSc Animal and Pasture Science
<b>Lecturer</b>	Ms H Theron	MScAgric (Viticulture), BSc Agriculture (Viticulture and Oenology)
<b>Lecturer</b>	Mr AP Nel	MSc Agriculture (Oenology) BSc Agriculture (Viticulture and Oenology)

## QUALIFICATIONS OFFERED

Undergrad or Post Graduate	Qualification Type	Qualification Code	Qualification Name	Campus offered	Minimum Duration (Years)	Maximum Duration (Years)
Undergrad	Diploma	D3AGRC	Diploma in Agriculture	Wellington	3	6
Undergrad	Diploma	D3AGRM	Diploma in Agricultural Management	Wellington	3	6
Postgrad	Baccalaureus Technologiae	BTAGRC	BTech: Agriculture	Wellington	1	2
Postgrad	Masters	MGAGRR	Master of Agriculture	Wellington	1	5

## DIPLOMA: AGRICULTURE

### COURSE AIM

The course is structured to provide a career-oriented professional education and qualification in order to prepare students for employment in the agricultural sector. The aim of the course is to train students in the latest agricultural techniques within the context of a specific specialisation field (fruit production; agronomy; viticulture; oenology or livestock production).

### PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose of this programme is to provide industry with agricultural and extension practitioners that can apply technical knowledge, practical competencies and appropriate extension and scientific communication skills in operating agricultural production units effectively as part of a production and/or an advisory team. Graduates will be able to define, conceptualise and develop basic solutions for problems of limited complexity relating to agricultural production systems and human relations.

### CAREER OPPORTUNITIES

Graduates follow career paths in agricultural research, extension, quality control, production and marketing. All of these are applicable in a wide variety of farming, research, agricultural input and marketing industries.

### ADMISSION REQUIREMENTS

For the minimum admission requirements, see admission requirements.

### PROFESSIONAL REGISTRATION

This qualification is not registered with any professional body.

### DURATION

Full-time: Three years, including Work Integrated Learning.  
For further information, please contact the Department of Agriculture directly.

### VENUE

The Agriculture-Hub of Wellington Campus

## DIPLOMA: AGRICULTURE

QUALIFICATION CODE: D3AGRC

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	1st Sem	PPD150S	Plant Production1	C		5	12	0.109	Continuous	Yes
1	1st Sem	AEM150S	Agricultural Economics & Marketing 1A	C		5	10	0.091	Continuous	Yes
1	1st Sem	CRO150S	Crop Protection 1A	C		5	10	0.091	Continuous	Yes
1	1st Sem	ASL150S	Agricultural Soil Science 1A	C		5	10	0.091	Continuous	Yes
1	1st Sem	ACN150S	Agricultural Computer and Numerical Literacy	C		5	10	0.091	Continuous	Yes
1	2nd Sem	AGT150S	Agricultural Extension 1	C		5	12	0.109	Continuous	Yes
1	2nd Sem	AEM160S	Agricultural Economics & Marketing 1B	C	AEM150S	6	12	0.109	Continuous	Yes
1	2nd Sem	CRO160S	Crop Protection 1B	C	CRO150S	6	12	0.109	Continuous	Yes
1	2nd Sem	ASL160S	Agricultural Soil Science 1B	C	ASL150S	6	12	0.109	Continuous	Yes
<b>CROP STREAM</b>										
1	2nd Sem	VPR150S	Vegetable Production	E		5	10	0.091	Continuous	Yes
<b>VITICULTURE &amp; OENOLOGY STREAM</b>										
1	2nd Sem	OEN150S	Oenology 1	E		5	10	0.091	Continuous	Yes
<b>LIVESTOCK STREAM</b>										
1	2nd Sem	LVP150S	Livestock Production 1	E		5	12	0.091	Continuous	Yes
2	1st Sem	AGT260S	Agricultural Extension 2A	C	AGT150S	6	14	0.108	Continuous	Yes
2	1st Sem	BID250S	Biometry	C		5	12	0.092	Continuous	Yes
2	1st Sem	CRO260S	Crop Protection 2	C	CRO160S	6	14	0.108	Continuous	Yes
<b>CROP STREAM (SELECT 2 SUBJECTS)</b>										
2	1st Sem	VIT260S	Viticulture 2A	E	PPD150S	6	12	0.092	Continuous	Yes
2	1st Sem	FON260S	Fruit Production 2A	E	PPD150S	6	12	0.092	Continuous	Yes
2	1st Sem	AGO260S	Agronomy 2A	E	PPD150S	6	12	0.092	Continuous	Yes
<b>VITICULTURE &amp; OENOLOGY STREAM (SELECT BOTH SUBJECTS)</b>										
2	1st Sem	OEN260S	Oenology 2A	E	OEN150S	6	12	0.092	Continuous	Yes
2	1st Sem	VIT262S	Viticulture 2A	E	PPD150S	6	12	0.092	Continuous	Yes
<b>LIVESTOCK STREAM (SELECT BOTH SUBJECTS)</b>										
2	1st Sem	ANN250S	Animal Nutrition	E		5	14	0.092	Continuous	Yes
2	1st Sem	LVP260S	Livestock Production 2A	E	LVP150S	6	12	0.092	Continuous	Yes
2	2nd Sem	AGT261S	Agricultural Extension 2B	C	AGT260S	6	14	0.108	Continuous	Yes

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
2	2nd Sem	AEM260S	Agricultural Economics & Marketing 2	C	AEM160S	6	14	0.108	Continuous	Yes
2	2nd Sem	ALE250S	Agricultural Engineering	C		5	10	0.076	Continuous	Yes
<b>CROP STREAM (SELECT 2 SUBJECTS CORRESPONDING WITH 1<sup>ST</sup> SEMESTER)</b>										
2	2nd Sem	FON261S	Fruit Production 2B	E	FON260S	6	14	0.108	Continuous	Yes
2	2nd Sem	AGO261S	Agromony 2B	E	AGO260S	6	14	0.108	Continuous	Yes
2	2nd Sem	VIT261S	Viticulture 2B	E	VIT260S	6	14	0.108	Continuous	Yes
<b>VITICULTURE &amp; OENOLOGY STREAM (SELECT BOTH SUBJECTS)</b>										
2	2nd Sem	OEN261S	Oenology 2B	E	OEN260S	6	14	0.108	Continuous	Yes
2	2nd Sem	VIT263S	Viticulture 2B	E	VIT262S	6	14	0.108	Continuous	Yes
<b>LIVESTOCK STREAM (SELECT BOTH SUBJECTS)</b>										
2	2nd Sem	LVP261S	Livestock Production 2B	E	LVP260S	6	14	0.108	Continuous	Yes
2	2nd Sem	PSS250S	Pasture Science	E		5	10	0.108	Continuous	Yes
3	Year	REM350S	Research Methodology: Introduction	C		5	15	0.125	Continuous	Yes
3	Year	ALE360S	Agricultural Environment	C	All subjects in 1 <sup>st</sup> & 2 <sup>nd</sup> year	6	15	0.125	Continuous	Yes
3	Year	AGD360S	Agricultural Production	C		6	25	0.208	Continuous	Yes
3	Year	LBP360S	Agricultural Labour Practice	C		6	15	0.127	Continuous	Yes
3	Year	IMD360S	Agricultural Management Information & Systems	C		6	20	0.165	Continuous	Yes
3	Year	AGP360S	Agricultural Practice	C		6	30	0.250	Continuous	Project

## BTECH: AGRICULTURE

### COURSE AIM

The course is structured to provide career-oriented education to prepare students for higher-level employment in the agricultural sector. Graduates will be conversant with the latest agricultural techniques within the context of a specific specialisation field (fruit production; agronomy; viticulture; oenology or livestock production).

### PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose of this programme is to provide industry with agricultural and extension practitioners that are able to apply technical knowledge, practical competencies and appropriate extension and scientific communication skills in operating agricultural production units effectively as part of a production and/ or advisory team. Graduates will be able to define, conceptualise and develop solutions for complex problems relating to agricultural production systems and human relations.

### CAREER OPPORTUNITIES

Graduates will be able to follow career paths in organised agricultural research, e.g. agricultural corporations, agricultural development institutions, the Department of Agriculture, agricultural input suppliers, production units, agricultural regulatory services, importers and exporters of agricultural produce.

### ADMISSION REQUIREMENTS

A National Diploma in Agriculture or an equivalent qualification on NQF level 6 is required. Agricultural Extension 3 and a pass mark of 60 % in the field of specialisation on exit level of the National Diploma: Agriculture are required for admission.

### PROFESSIONAL REGISTRATION

This qualification is not registered at any professional body

### DURATION

Full-time: One year

### VENUE

The Agriculture-Hub of Wellington Campus

## BACCALAUREUS TECHNOLOGIAE: AGRICULTURE

QUALIFICATION CODE: BTAGRC

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
4	Year	AGN100S	Agricultural Communication 1	C		7	30	0.250	Continuous	Yes
4	Year	ALE400S	Agricultural Extension 4	C		7	30	0.250	Continuous	Yes
4	Year	REA100S	Research Methodology	C		7	30	0.250	Continuous	Yes
<b>CHOOSE ONE OF THE FOLLOWING</b>										
4	Year	CPN400S	Crop Production 4	E		7	30	0.250	Continuous	Yes
4	Year	ANI400S	Animal Production 4	E		7	30	0.250	Continuous	Yes

## MASTER OF AGRICULTURE

QUALIFICATION CODE: MGAGRR

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
5	Year	AGC690R	Research Project and Dissertation	C		9	180	1.000	Continuous	Thesis

## DIPLOMA: AGRICULTURAL MANAGEMENT

### COURSE AIM

The course is structured to provide career-oriented education in order to prepare students for employment in the management-related sector of the agricultural industry. The course equips the student with the skills and techniques necessary for the analysis of agricultural production systems and the solving of agricultural management, technical and related problems in a variety of downstream sectors of the agriculture industry.

### PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose of this programme is to provide the industry with people who have the required technical knowledge and managerial competencies to manage agricultural enterprises effectively as part of a production team. Graduates will be able to solve problems regarding financial planning, business management and human resource management within an agricultural context.

### CAREER OPPORTUNITIES

Graduates follow career paths in organised agriculture, including agricultural corporations, agricultural development institutions, the Department of Agriculture, agricultural input suppliers and production units.

### ADMISSION REQUIREMENTS

For the minimum admission requirements, see admission requirements.

### PROFESSIONAL REGISTRATION

This qualification is not registered at any professional body.

### DURATION

Full-time: Three years, including Work Integrated Learning.  
For further information, please contact the Department of Agriculture directly.

### VENUE

Agriculture-Hub of Wellington Campus



## DIPLOMA: AGRICULTURE MANAGEMENT

QUALIFICATION CODE: D3AGRM

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	1st Sem	PPO150S	Plant Production 1	C		5	12	0.098	Continuous	Yes
1	1st Sem	AMM150S	Agricultural Marketing Management 1A	C		5	12	0.098	Continuous	Yes
1	1st Sem	AOM150S	Agricultural Operations Management 1A	C		5	12	0.098	Continuous	Yes
1	1st Sem	ASC150S	Agricultural Soil Science 1A	C		5	10	0.083	Continuous	Yes
1	1st Sem	ACL150S	Agricultural Calculations	C		5	10	0.083	Continuous	Yes
1	2nd Sem	LSP150S	Livestock Production 1	C		5	12	0.098	Continuous	Yes
1	2nd Sem	AMM160S	Agricultural Marketing Management 1B	C	AMM150S	6	12	0.098	Continuous	Yes
1	2nd Sem	AHR160S	Agricultural Human Resource Management	C		6	14	0.115	Continuous	Yes
1	2nd Sem	AOM160S	Agricultural Operations Management 1B	C	AOM150S	6	16	0.131	Continuous	Yes
1	2nd Sem	ASC160S	Agricultural Soil Science 1B	C	ASC150S	6	12	0.098	Continuous	Yes
2	1st Sem	AGR260S	Agricultural Production Management	C		6	16	0.136	Continuous	Yes
2	1st Sem	AGL260S	Agricultural Law	C		6	16	0.136	Continuous	Yes
2	1st Sem	PPO260S	Plant Production 2A	C	PPO150S	6	12	0.102	Continuous	Yes
2	1st Sem	LSP260S	Livestock Production 2A	C	LSP150S	6	12	0.102	Continuous	Yes
2	2nd Sem	AMM260S	Agricultural Marketing Management 2	C	AMM160S	6	14	0.118	Continuous	Yes
2	2nd Sem	AEG250S	Agricultural Engineering	C		5	10	0.085	Continuous	Yes
2	2nd Sem	PPO261S	Plant Production 2B	C	PPO260S	6	14	0.118	Continuous	Yes
2	2nd Sem	LSP261S	Livestock Production 2B	C	LSP260S	6	14	0.118	Continuous	Yes
2	2nd Sem	PAF250S	Pasture Science	C		5	10	0.085	Continuous	Yes
3	Year	RMD350S	Research Methodology	C		5	15	0.125	Continuous	Yes
3	Year	AGE360S	Agricultural Environment	C		6	15	0.125	Continuous	Yes
3	Year	PSM360S	Production Systems Management	C	All subjects in 1 <sup>st</sup> & 2 <sup>nd</sup> year	6	30	0.250	Continuous	Yes
3	Year	ALP360S	Agricultural Labour Practice	C		6	15	0.125	Continuous	Yes
3	Year	MIS360S	Management Information Systems	C		6	15	0.125	Continuous	Yes
3	Year	ARC360S	Agricultural Practice	C		6	30	0.250	Continuous	Project

## DIPLOMA SUBJECTS: AGRICULTURAL MANAGEMENT

### AGRICULTURAL CALCULATIONS

---

Pre-requisites: None

---

Course outline: This subject includes computer literacy using standard programs, as well as basic numeracy and calculation competencies required of a professional in the field of Agriculture.

---

Assessment: All assessments are compulsory

---

### AGRICULTURAL ENGINEERING

---

Pre-requisites: None

---

Course outline: Students must be able to know, understand and recommend various components used in agricultural systems, manage systems such as irrigation systems, drainage systems, cooling in greenhouses and hydroponic systems in greenhouses and do irrigation scheduling and calibration of spraying equipment.

---

Assessment: All assessments are compulsory

---

### AGRICULTURAL ENVIRONMENT

---

Pre-requisites: All subjects in the first four semesters

---

Course Outline: In this subject students investigate the internal composition and environment of a business in order to reveal the nature and structure of the business, its position within and how it functions in relation to the natural & physical environment, the business & economic environment and the legal & regulatory environment. Learning in the subject is focused on understanding the operations of the business, including the impact on and inter-relationship between the environment and the business.

---

### AGRICULTURAL LABOUR PRACTICE

---

Pre-requisites: All subjects in the first four semesters

---

Course Outline: In this subject students will study the utilization of labour in an agricultural business, the structure of labour in the business, motivation and promotion of labour, leadership and relevant labour legislation impacting on the business.

---

### AGRICULTURAL LAW

---

Pre-requisites: None

---

Course outline: This subject attempts to provide the student with the necessary knowledge and skills regarding common law, social legislation, labour relations and other legislation relevant to agricultural enterprises. The process of legislation, labour law applicable to agriculture, contract law, relevant agricultural laws, the agricultural transformation process and the contribution of agriculture to economic development are also included.

---

Assessment: All assessments are compulsory.

---

### MANAGEMENT INFORMATION SYSTEMS

---

Pre-requisites: All subjects in the first four semesters

---

Course Outline: In this subject students will study the management information system(s) utilized in an agricultural business. The different methods and mechanisms used to gather management information, the different sources of information as well as the way in which such information is used in decision making and different levels of planning within the business (strategic, tactical and operational) is studied. The emphasis is on the different sources of information and the impact it has on the business.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL MARKETING MANAGEMENT 1A**

---

Pre-requisites: None

---

Course outline: This subject introduces the business world and the place of agricultural management, the main economic systems, agriculture in the market economy, nature of business management, the establishment and management of an agricultural enterprise and entrepreneurship to the student.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL MARKETING MANAGEMENT 1B**

---

Pre-requisites: Agricultural Marketing Management 1A

---

Course outline: Introduction to agricultural marketing management, evolution of marketing thought, the marketing concept, components of the marketing process, market research, consumer behaviour, market segmentation, target market selection and positioning of agricultural products by the correct use of marketing mix.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL MARKETING MANAGEMENT 2**

---

Pre-requisites: Agricultural Marketing Management 1B

---

Course outline: This subject discusses the financial analysis, planning and control, financing and investment related to the correct valuation of farm assets and the enhancement of financial management of the farming enterprises.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL OPERATIONS MANAGEMENT 1A**

---

Pre-requisites: None

---

Course outline: This subject deals primarily with operations management, product planning and design, fixed and variable capacity planning, transportation methods, demand management, aggregate planning and master scheduling and operations scheduling.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL OPERATIONS MANAGEMENT 1B**

---

Pre-requisites: Agricultural Operations Management 1A

---

Course outline: This subject deals primarily with project management, total quality, inventory management, work study as management tool and productivity.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL PRACTICE**

---

Pre-requisites: All subjects during the first four semesters

---

Course outline: In this subject students will investigate the overall functioning of an agricultural business, critically analysing the role of management, the impact of infrastructure on the functioning of the business, the viability and sustainability of the business over the next five years, opportunities for growth, weak points, bottle necks and threats within the business. Students are expected to make recommendations for improvement of the business. The focus is strongly on the technical/scientific aspects of production within the business.

---

## **AGRICULTURAL PRODUCTION MANAGEMENT**

---

Pre-requisites: None

---

Course outline: This subject strives to develop the knowledge and skills of students to demonstrate the capital requirements, financing policy, the right to use land, the management of farm machinery and buildings and the investment of funds related to farming enterprises.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL SOIL SCIENCE 1A**

---

Pre-requisites: None

---

Course outline: Students should understand the origins of soil, the factors and processes of soil formation. Soil physical properties are explained including processes that take place in the formation of soil structure. Students are also introduced to basic chemistry and chemical reactions. Students are also expected to interpret the characteristics of selected clay minerals and explain the processes that take place in the clays. A basic understanding of soil biological processes and their roles in soil forming processes is also expected. The origins and different types of organic matter, enzyme activity and mineralisation processes are introduced.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL SOIL SCIENCE 1B**

---

Pre-requisites: Agricultural Soil Science 1A

---

Course outline: Students are introduced to soil profiles, soil horizons and soil classification, including the South African soil classification system. Students will also be introduced to soil survey methods. Students will also be required to understand nutrient cycles of nitrogen, phosphorus and potassium, and other plant nutrient elements. Students will also be required to understand soil fertility management using inorganic and organic sources, the different types of fertilizer and their application methods, and the South African fertilizer industry. Students should be able to interpret soil analysis results to make recommendations regarding soil improvement practises and design a fertilization program. Students should also understand soil-water-plant relations, including irrigation, irrigation scheduling and the soil water balance. Students will also be introduced to land suitability evaluation.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL HUMAN RESOURCE MANAGEMENT**

---

Pre-requisites: None

---

Course outline: This subject deals with human resources management and labour relations in the agricultural environment. In this subject students develop relevant knowledge and skills to deal with staffing and retention of people, behavioural aspects of employees (management as well as employees), group and organisational empowerment through interventions and strategic human resources management.

---

Assessment: All assessments are compulsory.

---

## **LIVESTOCK PRODUCTION 1**

---

Pre-requisites: None

---

Course outline: This course is an introduction to Livestock Ecology. In this subject students develop thematic knowledge applicable to farm animals, in the context of beef production. They become familiar with important terminology and are introduced to the field of farm animal management. The systems approach to understanding subject content is followed. This course further prepares students to learn, understand different aspects of beef Production systems, bull management, biosecurity, disease management and slaughter carcass quality.

---

## **LIVESTOCK PRODUCTION 2A**

---

Pre-requisites: Livestock Production 1

---

Course outline: This course deals with the theory of applied small stock production (including goat, sheep and angora livestock production systems). Students are expected to be able to manage all aspects of a small stock unit in the Western Cape and theory is based on practices of farmers in the surrounding area.

---

Assessment: All assessments are compulsory.

---

## **LIVESTOCK PRODUCTION 2B**

---

Pre-requisites: Livestock Production 2A

Course outline: This subject covers milk hygiene and dairy cow management. This entails primary milk production in the Western Cape. The first section of the course pertains to the composition and production of milk, while the second section is focused on management of the dairy cow over the period of the lactation/gestation cycle. The latter includes proper nutrition, disease management, housing, bedding systems, behavioural management and reproductive management. Students are exposed to a holistic approach to dairy production.

---

Assessment: All assessments are compulsory.

---

## **PASTURE SCIENCE**

---

Pre-requisites: None

Course outline: This subject focuses on the study of natural and cultivated pastures and how this underpins good animal management. The emphasis is always placed on the Fodder conservation, Forage production, planning, grazing systems and management of natural plant communities for stable, sustainable and profitable pasture based farming systems. Holistic and integrated feed flow plans are discussed, as well as correct cultivar choice for the Western Cape biomes, including grasses and legume species.

---

Assessment: All assessments are compulsory.

---

## **PLANT PRODUCTION 1**

---

Pre-requisites: None

Course outline: The aims of this subject are to expose the student to basic knowledge of plant morphology, anatomy and physiology. This will contribute to the foundational knowledge required in specialist fields (Agronomy, Viticulture and Fruit Production) in the second year of study.

---

Assessment: All assessments are compulsory.

---

## **PLANT PRODUCTION 2A**

---

Pre-requisites: Plant Production 1

Course outline: Definition of pest, major groups of agricultural pests, integrated pest management, pest management strategies and tactics, pre-harvest interval, residues, re-entry interval, phytotoxicity, and pesticide resistance, minimising pesticide impact, pesticide application equipment, calibration of spray equipment, management of plant pathogens (including nematodes), insect pests and weeds.

---

Assessment: All assessments are compulsory.

---

## **PLANT PRODUCTION 2B**

---

Pre-requisites: Plant Production 2A

---

Course outline: Difference between agriculture and horticulture, horticultural classifications, the market chain for fresh horticultural products, protected cropping; principles of vegetable production and production management for a selection of important vegetable; reasons why fruit production is a unique part of horticulture, principles of fruit production, overview of the South African grain industry, production of maize and wheat as the two most important grain crops in South Africa.

Assessment: All assessments are compulsory.

## RESEARCH METHODOLOGY: INTRODUCTION

Pre-requisites: None

Course outline: The aim of this subject is to introduce students to the basic principles of scientific research and the research cycle. After completion of this course, students should be able to write a project proposal for a research topic of their choice. This includes the formulation of the problem statement, deciding on the methods of data collection and analysis as well as the critical evaluation and discussion of the results based on a complete literature study, using the accepted style of scientific writing.

Assessment: All assessments are compulsory.

## DIPLOMA SUBJECTS: AGRICULTURE

Note that the information provided below is only a short summary – please refer to the respective Subject Guides for more detail.

### AGRICULTURAL COMPUTER AND NUMERICAL LITERACY

Pre-requisites: None

Course outline: This subject includes computer literacy using standard programs, as well as basic numeracy and calculation competencies required of a professional in the field of Agriculture.

Assessment: All assessments are compulsory.

### AGRICULTURAL ECONOMICS & MARKETING 1A

Pre-requisites: None

Course outline: This subject addresses the concept of macro and micro economics, how prices and quantities exchanged are determined by supply and demand, the various functions of money in the economy and monetary and fiscal policies.

Assessment: All assessments are compulsory.

### AGRICULTURAL ECONOMICS & MARKETING 1B

Pre-requisites: Agricultural Economics & Marketing 1A

Course outline: This subject introduces agricultural marketing management; agricultural marketing; components, concept and the process; the market of agricultural products by using marketing mix, market instruments and segmentation for the positioning of agricultural products in the market.

Assessment: All assessments are compulsory.

### AGRICULTURAL ECONOMICS & MARKETING 2

Pre-requisites: Agricultural Economics & Marketing 1B

Course outline: This subject discusses the financial analysis, planning and control, financing and investment related to the correct valuation of farm assets and the enhancement of financial management of the farming enterprises.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL ENGINEERING**

---

Pre-requisites: None

---

Course outline: Students must be able to know, understand and recommend various components used in agricultural systems, manage systems such as irrigation systems, drainage systems, cooling in greenhouses and hydroponic systems in greenhouses and do irrigation scheduling and calibration of spraying equipment.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL ENVIRONMENT**

---

Pre-requisites: All subjects in the first four semesters.

---

Course Outline: In this subject students investigate the internal composition and environment of a business in order to reveal the nature and structure of the business, its position within and how it functions in relation to the natural & physical environment, the business & economic environment and the legal & regulatory environment. Learning in the subject is focused on understanding the operations of the business, including the impact on and inter-relationship between the environment and the business.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL EXTENSION 1**

---

Pre-requisites: None

---

Course outline: The purpose of this module is to facilitate the learning process for the learners to understand and to gain basic skills in the basic philosophy of agricultural extension; the role and concepts of agricultural extension in agricultural development; the basic concepts, role and importance of communication in agricultural extension and rural development and the adoption and diffusion of innovations in farming communities

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL EXTENSION 2A**

---

Pre-requisites: Agricultural Extension 1

---

Course outline: The purpose of this module is to facilitate the learning process for the learners to understand and gain insight into the human problems experienced in extension and rural development including aspects of rural sociology, group dynamics, leadership development and adult education.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL EXTENSION 2B**

---

Pre-requisites: Agricultural Extension 2A

---

Course outline: Through this module the learner will acquire a functional knowledge of the human behavioural aspects of agricultural production and its associated decision making processes. This module will further facilitate the learning process for learners to equip them with knowledge and understanding of and insight into the planning, implementation, monitoring and evaluation of agricultural extension and rural development projects and programmes. This includes insight into aspects and concepts of the extension programming and evaluation process; research methodology in extension, evaluation of extension projects and programmes and evaluation of development projects; and the application of accepted management practices and skills in agricultural extension.

---

Assessment: All assessments are compulsory.

---

## **AGRICULTURAL LABOUR PRACTICE**

Pre-requisites: All subjects in the first four semesters.

Course Outline: In this subject students will study the utilization of labour in an agricultural business, the structure of labour in the business, motivation and promotion of labour, leadership and relevant labour legislation impacting on the business.

Assessment: All assessments are compulsory.

## **AGRICULTURAL MANAGEMENT INFORMATION AND SYSTEMS**

Pre-requisites: All subjects in the first four semesters.

Course Outline: In this subject students will study the management information system(s) utilized in an agricultural business. The different methods and mechanisms used to gather management information, the different sources of information as well as the way in which such information is used in decision making and different levels of planning within the business (strategic, tactical and operational) is studied. The emphasis is on the different sources of information and the impact it has on the business.

Assessment: All assessments are compulsory.

## **AGRICULTURAL PRACTICE**

Pre-requisites: All subjects in the first four semesters.

Course outline: In this subject students will investigate the overall functioning of an agricultural business, critically analysing the role of management, the impact of infrastructure on the functioning of the business, the viability and sustainability of the business over the next five years, opportunities for growth, weak points, bottle necks and threats within the business. Students are expected to make recommendations for improvement of the business. The focus is strongly on the technical/scientific aspects of production within the business.

Assessment: All assessments are compulsory.

## **AGRICULTURAL PRODUCTION**

Pre-requisites: All subjects in the first four semesters

Course outline: In this subject students will investigate the physical and biological aspects involved in the production process of a crop or livestock enterprise (depending on where the student is doing experiential learning). The student is to gain knowledge of the various activities and time schedules associated with these activities during the production system, as well as the different resources linked to the production and marketing processes. Detailed information, based on and incorporating agricultural science, must be supplied and the student must illustrate a clear understanding of the production and marketing processes involved in the crop/livestock system.

## **AGRICULTURAL SOIL SCIENCE 1A**

Pre-requisites: None

Course outline: Students should understand the origins of soil, the factors and processes of soil formation. Soil physical properties are explained including processes that take place in the formation of soil structure. Students are also introduced to basic chemistry and chemical reactions. Students are also expected to interpret the characteristics of selected clay minerals and explain the processes that take place in the clays. A basic understanding of soil biological processes and their roles in soil forming processes is also expected. The origins and different types of organic matter, enzyme activity and mineralisation processes are introduced.

Assessment: All assessments are compulsory.

## **AGRICULTURAL SOIL SCIENCE 1B**

Pre-requisites: Agricultural Soil Science 1A

Course outline: Students are introduced to soil profiles, soil horizons and soil classification, including the South African soil classification system. Students will also be introduced to soil survey methods. Students will also be required to understand nutrient cycles of nitrogen, phosphorus and potassium, and other plant nutrient elements. Students will also be required to understand soil fertility management using inorganic and organic sources, the different types of fertilizer and their application methods, and the South



African fertilizer industry. Students should be able to interpret soil analysis results to make recommendations regarding soil improvement practises and design a fertilization program. Students should also understand soil-water-plant relations, including irrigation, irrigation scheduling and the soil water balance. Students will also be introduced to land suitability evaluation.

Assessment: All assessments are compulsory.

## **AGRONOMY 2A**

Pre-requisites: Plant Production 1

Course outline: Principles of agronomy, definitions of important agronomic terms, role of an agronomist, classification of field crops, yield limiting factors, intensive cropping, principles of intercropping and crop rotation, overview of the South African grain industry, principles of maize, wheat, barley and potato production with reference to the extent of the industry, the growth and development of crops and cultivation practices, conservation agriculture, guidelines for selecting crop cultivars, yield components, benefits of a sustainable crop rotation system .

Assessment: All assessments are compulsory.

## **AGRONOMY 2B**

Pre-requisite: Agronomy 2A

Course outline: Cultivation of crops with emphasis on industrial and oilseed crops, including the extent of the industry, the growth and development of crops and cultivation practices. Crops covered in detail are cotton and sugarcane (industrial crops), and sunflower, soybean and canola (oilseed crops). The objective of the course is to introduce students to production practices of specialized crops, giving special attention to relating crop physiological and ecological principles as a basis of the management of field crops studied.

Assessment: All assessments are compulsory.

## **ANIMAL NUTRITION**

Pre-requisites: None

Course outline: During this course an analytical approach is taken to the study of ruminant nutrition and non-ruminant. Students learn the dynamics of digestion, nutrient content of different feeds found in the Western Cape. Student also learn to determine the nutrient requirements of different classes of livestock and learn how to formulate ration in order to feed animals in different production stages.

Assessment: All assessments are compulsory.

## **BIOMETRY**

Pre-requisites: None

Course outline: The purpose of this subject is to expose students to basic statistical principles in order for them to eventually interpret and understand results discussed in scientific articles. At the end of this course the student should be comfortable with a basic statistical terminology and data presentation.

Assessment: All assessments are compulsory.

## **CROP PROTECTION 1A**

Pre-requisites: None

Course outline: This subject is an introductory course in crop protection, preparing the student to have the ability to identify diseases and to know how to control them. The subject covers the following content: biotic and abiotic causes of plant diseases, pathogen survival and dispersal of plant parasites, effects of pathogens on plant physiological processes, the infection process, plant defences, the infection process and disease development, disease assessment, , chemical control as well as biological control. Introduction to insects, Introduction to weed management

Assessment: All assessments are compulsory.

## **CROP PROTECTION 1B**

---

Pre-requisites: Crop Protection 1A

---

Crop Protection 1B builds on the knowledge obtained from Crop Protection 1A. The subject covers the following content: factors that affect disease development, the disease cycle, plant defenses, disease measurement, cuticle and moulting in insects, diet and feeding in insects, the insect digestive, respiratory and circulatory systems, excretion in insects, sexual and asexual (vegetative) reproduction in weeds, weed-crop interactions, and minimizing pesticide impact

---

Assessment: All assessments are compulsory.

---

## **CROP PROTECTION 2**

---

Pre-requisites: Crop Protection 1B

---

Course outline: This course covers the management of important pests in crop production. The content covered include: plant disease epidemiology (disease progress, control of epidemics and disease management); insect ecology (insect overwintering, insects as pests, insect pest control); integrated pest management (field scouting and monitoring, pest managements strategies and tactics); and principles of weed ecology, including methods of weed management.

---

Assessment: All assessments are compulsory.

---

## **FRUIT PRODUCTION 2A**

---

Pre-requisites: Plant Production

---

Course outline: Students must understand aspects of the deciduous fruit tree such as cold requirement, bud development, flowering and fruit development and be able to apply practices such as thinning, picking readiness, post-harvest handling and cooling to manipulate the fruit tree for higher yields of a better quality fruit.

---

Assessment: All assessments are compulsory.

---

## **FRUIT PRODUCTION 2B**

---

Pre-requisites: Fruit Production 2A

---

Course outline: Students must understand how to establish and manipulate an orchard, plant young trees, train, prune, fertilise, irrigate and spray deciduous and citrus fruit trees with chemicals in order to ensure the highest possible yield of the best possible quality over the longest period of time at the lowest cost.

---

Assessment: All assessments are compulsory.

---

## **LIVESTOCK PRODUCTION 1**

---

Pre-requisites: None

---

Course outline: This course is an introduction to Livestock Ecology. In this subject students develop thematic knowledge applicable to farm animals, in the context of beef production. They become familiar with important terminology and are introduced to the field of farm animal management. The systems approach to understanding subject content is followed. This course further prepares students to learn, understand different aspects of beef Production systems, bull management, biosecurity, disease management and slaughter carcass quality.

---

Assessment: All assessments are compulsory.

---

## LIVESTOCK PRODUCTION 2A

---

Pre-requisites: Livestock Production 1

---

Course outline: Definition of pest, major groups of agricultural pests, integrated pest management, pest management strategies and tactics, pre-harvest interval, residues, re-entry interval, phytotoxicity, and pesticide resistance, minimising pesticide impact, pesticide application equipment, calibration of spray equipment, management of plant pathogens (including nematodes), insect pests and weeds

---

Assessment: All assessments are compulsory.

---

## LIVESTOCK PRODUCTION 2B

---

Pre-requisites: Livestock Production 2A

---

Course outline: This subject covers milk hygiene and dairy cow management. This entails primary milk production in the Western Cape. The first section of the course pertains to the composition and production of milk, while the second section is focused on management of the dairy cow over the period of the lactation/gestation cycle. The latter includes proper nutrition, disease management, housing, bedding systems, behavioural management and reproductive management. Students are exposed to a holistic approach to dairy production.

---

Assessment: All assessments are compulsory.

---

## OENOLOGY 1

---

Pre-requisites: None

---

Course outline: Course outline: This subject is an introductory course in the making of red and white wine, preparing the student for the practically oriented course of Oenology 2A. In this subject the following chapters are discussed: The history of the South African wine industry; grape components, berry growth and ripening; the basic winemaking process, with emphasis on specific actions performed when respectively making red and white table wines. Malolactic fermentation is discussed as well as the usage of wood and wood products during the winemaking process; the Wine of Origin scheme, the certification process, the evaluation of wine and interpretation of wine analysis results. The various methods of colour extraction are also described. The various factors that lead to high volatile acidity as well as the prevention in wine are discussed.

---

Assessment: All assessments are compulsory.

---

## OENOLOGY 2A

---

Pre-requisites: Oenology 1

---

Course outline: Course outline: This subject is an introductory course in the making of red and white wine. In this subject the following chapters are discussed: How to plan for a harvest and the correct way to take a representative grape sample. After that the student will be taught the various methods of harvesting, off-loading at the cellar, crushing and destemming, transport systems and the various pumps used in a cellar. The next step in winemaking is probably the most crucial step and here the student will be taught about balancing of grape juice. Protein and tartrate stabilisation will be discussed as well as the various ways to clarifying the wine. The last module in this series will be on the different styles of wines to be made. This will include botrytized wines, non botrytized wines, fortified wines (port and sherry) and sparkling wines. After this modules the student should have a working knowledge on how wine is made, how to balance the juice and how to handle wine. The practical in this module will give the student a change in making his own wine, designing his own label and also to market his own wine.

---

Assessment: All assessments are compulsory.

---

## OENOLOGY 2B

---

Pre-requisites: Oenology 2A

---

Course Outline: Agriculture (Viticulture and Oenology), preparing the student for the year of experiential training in industry. In this subject the following chapters are discussed: The principles and application of the IPW scheme; management of cellar waste water; the basic principles of the laws on occupational health and safety; aspects regarding cellar safety and the duties of the various role players; the most important Old and New World wine producing countries, especially with regard to wine styles and cultivars; the reason for, and the application of the addition of oxygen and ascorbic acid during the winemaking process as well as making informed decisions regarding this aspect; the causes of spoiled and faulty wines as well as the practices that could be applied by the winemaker to avoid wine spoilage; the use of enzymes, brandy production, the attainment of a healthy wine environment through good winemaking practices; identification and management of problem fermentations, as well as sluggish and stuck fermentations; the SAWIS (South African Wine Industry Information and Systems) documentation system.

Assessment: All assessments are compulsory.

## PASTURE SCIENCE

Pre-requisites: None

Course outline: This subject focuses on the study of natural and cultivated pastures and how this underpins good animal management. The emphasis is always placed on the Fodder conservation, Forage production, planning, grazing systems and management of natural plant communities for stable, sustainable and profitable pasture based farming systems. Holistic and integrated feed flow plans are discussed, as well as correct cultivar choice for the Western Cape biomes, including grasses and legume species.

Assessment: All assessments are compulsory.

## PLANT PRODUCTION 1

Pre-requisites: None

Course outline: The aims of this subject are to expose the student to basic knowledge of plant morphology, anatomy and physiology. This will contribute to the foundational knowledge required in specialist fields (Agronomy, Viticulture and Fruit Production) in the second year of study.

Assessment: All assessments are compulsory.

## RESEARCH METHODOLOGY: INTRODUCTION

Pre-requisites: None

Course outline: The aim of this subject is to introduce students to the basic principles of scientific research and the research cycle. After completion of this course, students should be able to write a project proposal for a research topic of their choice. This includes the formulation of the problem statement, deciding on the methods of data collection and analysis as well as the critical evaluation and discussion of the results based on a complete literature study, using the accepted style of scientific writing.

Assessment: All assessments are compulsory.

## VEGETABLE PRODUCTION

Pre-requisites: None

Course outline: This subject covers principles and methods of vegetable production, drawing information from relevant disciplines in crop production, such as Crop Protection and Agricultural Soil Science. The scope of the course concentrates on the production practices and general field management of selected vegetable crops cultivated in South Africa.

Assessment: All assessments are compulsory.

## VITICULTURE 2A

Pre-requisites: Plant Production

Course outline: Origin, description, identification and cultivation properties of most important rootstock and wine grape cultivars, principles of site analysis and cultivar choice, basic grapevine anatomy, morphology and physiology; concepts of bud dormancy and

fertility, grapevine vegetative growth and phenology, reproductive growth and ripening, translocation patterns of photosynthetates in grapevine canopies and factors contributing to the size and quality of the yield.

Assessment: All assessments are compulsory.

## VITICULTURE 2B

Pre-requisites: Viticulture 2A

Course outline: Improvement of grapevine material, vegetative propagation and nursery practices, trellising systems, vine spacing, planting and development of young vines, winter pruning and canopy management with reference to grapevine anatomy, morphology and physiology..

Assessment: All assessments are compulsory.

# BACCALAUREUS TECHNOLOGIAE SUBJECTS: AGRICULTURE

Note that the information provided below is only a short summary – please refer to the respective Subject Guides for more detail.

## AGRICULTURAL COMMUNICATION 1

Pre-requisites: None

Course outline: This course is aimed at equipping senior students who are about to enter the workplace with a “toolkit” that will enable them to communicate their science effectively in the work environment. Upon completion of the course students will understand the scientific communication process, categories of communication, why communication is important in the workplace and barriers to communication. They will also have studied the theory of behaviour change, how communication can be utilised in persuasion, promotional communication and the art of effective writing. Through practical sessions, students are also trained in scientific writing and public speaking.

Assessment: All assessments are compulsory.

## AGRICULTURAL EXTENSION 4

Pre-requisites: Agricultural Extension subject at NQF 6

Course outline: This course equips students to identify and describe a typical agricultural problem on a farm or within a rural community, do a comprehensive physical and human conceptualisation of the problem, identify information needs and formulate objectives for an extension programme to solve the problem, design a programme of activities (work plan) with a timeframe and budget to be executed, and design applicable evaluation methods to assess the effectiveness and impact of the extension programme. The extension programme must be documented in a report for submission.

Assessment: All assessments are compulsory.

## ANIMAL PRODUCTION 4

Pre-requisites: Animal Production 3 or related subject at NQF 6

Course outline: Students must identify a researchable problem in the area of Animal Science which includes the subdivisions of reproduction, breeding and selection, nutrition and pasture management, niche production systems, or disease management. Students must complete a comprehensive literature review, compose a research protocol in which the research problem is outlined and choose a suitable methodology (surveys, case studies, questionnaires and interviews) to complete the research. Results are discussed critically and submitted as part of the final project report at the end of the year.

Assessment: All assessments are compulsory.

## CROP PRODUCTION 4

Pre-requisites: Crop Production 3 or related subject at NQF 6

---

Course outline: The aim of this subject is to deepen and broaden the knowledge of the student in the specialist area of choice. Students also need to write a research report (based on a literature study), which will expose them to research principles and writing and start to prepare them for doing a Master's degree. They should identify a research topic, conduct a scientific literature search and write a scientific literature review with correct usage of citations, use data and present it in a scientific appropriate manner and base their discussion and conclusions on logical links made between own findings and published literature discussed in review. Overall, students should demonstrate autonomy of learning in the specialist area of preference.

---

Assessment: All assessments are compulsory.

---

## **RESEARCH METHODOLOGY 1**

---

Pre-requisites: None

---

Course outline: The aim of this subject is to introduce students to the basic principles of scientific research and the research cycle. After completion of this course, students should be able to write a project proposal for a research topic of their choice. This includes the formulation of the problem statement, deciding on the methods of data collection and analysis as well as the critical evaluation and discussion of the results based on a complete literature study, using the accepted style of scientific writing.

---

Assessment: All assessments are compulsory.

---

## DEPARTMENT OFFICE-BEARERS

POSITION	NAME	TELEPHONE	FAX	E-MAIL
Ass. Prof SKO Ntwampe	Head of Department	021 460 9097	021 460 3193	ntwampes@cput.ac.za
Ms N Mfayana	Administrative Assistant	021 460 3186	021 460 3854	MfayanaN@cput.ac.za

## ACADEMIC STAFF (PERMANENT)

POSITION	NAME	QUALIFICATIONS
<b>Associate Professor</b>	AProf SKO Ntwampe	Eng D, HDET, MSDAIChe, DTech
<b>Associate Professor</b>	AProf M Nakhooda	BSc, BSc Hons, MSc, PhD
<b>Associate Professor</b>	AProf AM Opperman	BSc (Diet), MSc, (Nutrition), PhD (RDSA)
<b>Associate Professor</b>	AProf I Venter	BA, B Ed, B Hons, M Ed (Psych)
<b>Senior Lecturer</b>	Ms LD du Toit	B Home Econ, NHD, B Ed, M Tech
<b>Senior Lecturer</b>	Dr VA Jackson	BSc, BSc Hons, MSc (Microbiology), D Tech (Biomedical Technology)
<b>Senior Lecturer</b>	Dr R Mundembe	BSc Hons (BZ), MSc, DPhilSc
<b>Senior Lecturer</b>	Dr V Okudoh	ND, B Tech Hons, MSc, PGCE, PhD
<b>Lecturer</b>	Ms LC April	BA, B Ed, B Hons, M Ed (Psych)
<b>Lecturer</b>	Mr W Clarence	BA, M (Business Administration)
<b>Lecturer</b>	Ms T Govender	M Tech
<b>Lecturer</b>	Mrs R Hanekom	B Home Eco, M Tech
<b>Lecturer</b>	Mrs EC Hinrichsen-Swart	ND, NHD, B Tech

## QUALIFICATIONS OFFERED

Undergrad or Post Graduate	Qualification Type	Qualification Code	Qualification Name	Campus offered	Minimum Duration (Years)	Maximum Duration (Years)
Undergrad	Diploma	D3BIOT	Diploma in Biotechnology	District Six	3	6
Undergrad	Diploma	D3BITX	Diploma in Biotechnology (Extended)	District Six	4	7
Undergrad	Diploma	D3CSFN	Diploma in Consumer Science in Food & Nutrition	District Six	3	6
Undergrad	Diploma	D3CSFX	Diploma in Consumer Science in Food & Nutrition (Extended)	District Six	4	7
Postgrad	Baccalaureus Technologiae	BTCSFN	BTech: Consumer Science: Food & Nutrition	District Six	1	2
Postgrad	Master	MGCSFR	Master of Consumer Science: Food & Nutrition	District Six	2	5



## DIPLOMA: BIOTECHNOLOGY

### COURSE AIM

The course is structured to provide diplomats who are competent in theoretical, applied and general skills across a variety of scientific and technology disciplines. During the first and second semester students acquire broad insights into the microbiological and biochemical underpinnings of biotechnology. During the third and fourth semester the focus of teaching and training is on in-depth theoretical and practical knowledge in microbial biochemistry, molecular biology, fermentation technology and bioprocessing fields. Research-orientated graduates are facilitated to achieve higher qualifications and play a role in the development, production and analysis of biotechnology-important products in the bioprocessing/ biomanufacturing industries.

### PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose of the Diploma in Biotechnology is to provide graduates who are able to apply theoretical and practical scientific knowledge in the Microbiological-, Biochemical-, Analytical- and Bioprocessing fields to the Biotechnology industry. The graduates will perform routine production operations as well as troubleshoot in the pharmaceutical-, environmental-, medical-, and food industry sectors. They will furthermore be able to function as Biotechnologists in multidisciplinary teams which include engineers, scientists and business/operations managers. Graduates who successfully complete the Diploma in Biotechnology will be able to demonstrate detailed theoretical and applied knowledge relevant to an array of Biotechnology fields, thus partake in technology transfer for the benefit of communities, advocating bioethics, social responsibility and environmental sustainability. They will be technologically adept, technically skilled thus employable, socially responsive, problem solving in their thinking and actions as well as being environmentally conscious – core values of CPUT as a technological university.

### CAREER OPPORTUNITIES

Biotechnology is a scarce skills area as identified in the National Skills Development Strategy. One such scarce skills area which is serviced by biotechnologists is Medicinal and Pharmaceutical Biotechnology, including Biomedical engineering, use of genetics to study population and migration patterns, gene and paternity testing, DNA forensics, medical genetics, Gene testing and gene therapy, Pharmacogenomics, chemical, vaccine, medicine development and production; pathogen (disease) identification, and biological and chemical warfare protection. A second area is that of Food and Agriculture, including genetic modification of foods and seeds, biopesticides and nutraceutical development and bioprocessing chamber design and production. A third area is that of Energy and the Environment, including environmental studies, toxic waste clean-up, and creation of new energy sources via engineering and life science research.

### ADMISSION REQUIREMENTS

Minimum admission requirements are NSC level 4 passes in English, Mathematics, Life Sciences and Physical Sciences.

### PROFESSIONAL REGISTRATION

This qualification is not registered with any professional body.

### DURATION

Full-time: Three years, including Work Integrated Learning (Mainstream)  
For further information, please contact the Department of directly.

### VENUE

District Six Campus

## DIPLOMA: BIOTECHNOLOGY (MAIN STREAM)

QUALIFICATION CODE: D3BIOT

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	1st Sem	CHI150S	Chemistry 1	C		5	18	0.150	Continuous	Yes
1	1st Sem	BIO150S	Biotechnology 1: Introduction	C		5	14	0.117	Continuous	Yes
1	1st Sem	WIS150S	Mathematics	C		5	10	0.083	Continuous	Yes
1	1st Sem	PHB150S	Physics for Biology	C		5	14	0.117	Continuous	Yes
1	2nd Sem	BIG150S	Biochemistry 1	C	CHI150S	5	16	0.133	Continuous	Yes
1	2nd Sem	BIC150S	Bio-Analytical Chemistry 1	C	CHI150S	5	16	0.133	Continuous	Yes
1	2nd Sem	IMM150S	Immunology	C		5	15	0.125	Continuous	Yes
1	2nd Sem	MIY150S	Microbiology 1	C	CHI150S	5	17	0.142	Continuous	Yes
2	1st Sem	BIG260S	Biochemistry 2A	C	CHI150S/ BIG150S/ MIY150S	6	15	0.115	Continuous	Yes
2	1st Sem	MIY260S	Microbiology 2A	C	MIY150S	6	16	0.124	Continuous	Yes
2	1st Sem	OPM250S	Operations Management	C		5	13	0.100	Continuous	Yes
2	1st Sem	BOP260S	Bioprocessing 2A	C	MIY150S/ WIS150S	6	15	0.115	Continuous	Yes
2	2nd Sem	MIY261S	Microbiology 2B	C	MIY150S/ MIY260S	6	16	0.124	Continuous	Yes
2	2nd Sem	MMB260S	Molecular Biology Techniques	C	MIY150S/ MIY260S	6	15	0.115	Continuous	Yes
2	2nd Sem	BOP261S	Bioprocessing 2B	C	BOP260S	6	15	0.115	Continuous	Yes
2	2nd Sem	BIC260S	Bio-Analytical Chemistry 2	C	BIG150S/ BIC150S	6	15	0.115	Continuous	Yes
2	2nd Sem	BWP250S	Biotechnology Workplace Preparedness	C	BIG260S/ MIY260S/ OPM250S/ BOP260S	5	10	0.077	Continuous	No
3	1st Sem	RET360S	Research Methodology: Introduction	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	10	0.083	Continuous	No
3	Year	ABT360S	Applied Biotechnology	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	20	0.167	Continuous	No

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
3	Year	BIP360S	Biotechnology Workplace-based Learning	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	60	0.500	Continuous	No
3	Year	BTP360S	Biotechnology Integrated Project 3	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	30	0.250	Continuous	No

## DIPLOMA: BIOTECHNOLOGY (EXTENDED)

QUALIFICATION CODE: D3BITX

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	1st Sem	BIO150S	Biotechnology 1A: Introduction	C		5	14	0.124	Continuous	Yes
1	Year	CHI150X	Chemistry 1	c		5	18	0.150	Continuous	Yes
1	Year	WIS150X	Mathematics	C		5	10	0.083	Continuous	Yes
1	Year	PHB150X	Physics for Biology	C		5	14	0.115	Continuous	Yes
2	1st Sem	BIG150X	Biochemistry 1	C	CHI150X	5	16	0.130	Continuous	Yes
2	1st Sem	MIY150X	Microbiology 1	C	CHI150X	5	17	0.142	Continuous	Yes
2	1st Sem	OPM250S	Operations Management	C		5	13	0.100	Continuous	Yes
2	2nd Sem	IMM150S	Immunology	C		5	15	0.126	Continuous	Yes
2	2nd Sem	BIC150X	Bio-Analytical Chemistry 1	C	CHI150X	5	16	0.130	Continuous	Yes
3	1st Sem	BIG260S	Biochemistry 2A	C	CHI150X/ BIG150X/ MIY150X	6	15	0.115	Continuous	Yes
3	1st Sem	MIY260S	Microbiology 2A	C	MIY150X	6	16	0.124	Continuous	Yes
3	1st Sem	BOP260S	Bioprocessing 2A	C	MIY150X/ WIS150X	6	15	0.115	Continuous	Yes
3	2nd Sem	MIY261S	Microbiology 2B	C	MIY150X/ MIY260S	6	16	0.124	Continuous	Yes
3	2nd Sem	MMB260S	Molecular Biology Techniques	C	MIY150X/ MIY260S	6	15	0.115	Continuous	Yes
3	2nd Sem	BOP261S	Bioprocessing 2B	C	BOP260S	6	15	0.115	Continuous	Yes
3	2nd Sem	BIC260S	Bio-Analytical Chemistry 2	C	BIG150X/ BIC150X	6	15	0.115	Continuous	Yes
3	2nd Sem	BWP250S	Biotechnology Workplace Preparedness	C	BIG260S/ MIY260S/ OPM250S/ BOP260S	5	10	0.077	Continuous	No
4	1st Sem	RET360S	Research Methodology: Introduction	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	10	0.083	Continuous	No
4	Year	ABT360S	Applied Biotechnology	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	20	0.167	Continuous	No

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
4	Year	BIP360S	Biotechnology Workplace-based Learning	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	60	0.500	Continuous	No
4	Year	BTP360S	Biotechnology Integrated Project 3	C	BIC260S/ BOP261S/ BWP250S/ MIY261S/ MMB260S	6	30	0.250	Continuous	No

## DIPLOMA SUBJECTS: BIOTECHNOLOGY

Note that the information provided below is only a short summary – please refer to the respective Subject Guides for more detail.

\* FISA: Final Integrated Summative Assessment

### BIOTECHNOLOGY I: INTRODUCTION

---

Pre-requisites: None

---

Course outline: The origins of biotechnology; Microorganisms and their role in disease causation; Antimicrobial treatments used to kill or inhibit microorganisms; Good hygienic practices; Proper sanitising methods and practices; Hazard Analysis Critical Control Point quality control system; Waste management in different systems; Computer Skills: Word and Powerpoint. Entry level work preparedness. Work ethic, writing, plagiarism.

---

Assessment: All assessments are compulsory.

---

### MATHEMATICS

---

Pre-requisites: None

---

Course outline: Calculus, Statistics, Mathematical modelling, Trending analysis, Sampling techniques, Calibration techniques, Sensitivity of analyses, Logarithms and exponents, Graphs.

---

Assessment: All assessments are compulsory.

---

### PHYSICS FOR BIOLOGY

---

Pre-requisites: None

---

Course outline: Theory: Introduction. Mechanics and Fluids. Molecular and Matter: (a) Heat (b) Optics (c) Waves. Current electricity. Batteries Emf and circuits. Electrical energy and power. Atomic physics. Radioactivity. Sound. Electromagnetism.

---

Assessment: All assessments are compulsory.

---

### CHEMISTRY 1

---

Pre-requisites: None

---

Course outline: Inorganic: Matter, Atomic Structure, Periodic Table; Chemical bonding, composition, equations and stoichiometry, Gases, liquids, and solids, Solutions, Chemical equilibrium, Acids, bases and salts, Oxidation and reduction, Electrochemistry.

Organic: Carbon structures, functional groups, Kinds of Organic reactions, Hydrocarbons, Classification, nomenclature and reactions of: alkanes, cycloalkanes, alkenes, alkynes, haloalkanes, aromatic compounds; alcohols and phenols, ethers, aldehydes and ketones, carboxylic acids, amides and amines.

---

Assessment: All assessments are compulsory.

---

### MICROBIOLOGY I

---

Pre-requisites: Chemistry 1

---

Course outline: The origins of microbiology; The use and functions of different microscopic and staining techniques; Microbial taxonomy and phylogeny; The structure of prokaryotic cells. The structure of eukaryotic cells. The nutritional requirements of microorganisms for growth, as well as microbial movement; Microbial growth; The effect that microorganisms have on food; The study of Eumycota (fungi); Microbial diseases as well as ways in which to control them.

---

Assessment: All assessments are compulsory.

---

## BIOCHEMISTRY I

Pre-requisites: Chemistry 1

Course outline: Structure and reactivity of carbohydrates, lipids, proteins, nucleic acids. Analysis of above including centrifugation, kjeldhal, uv and vis spectroscopy, qualitative methods.

Assessment: All assessments are compulsory.

## IMMUNOLOGY

Pre-requisites: None

Course outline: Introduction to immunology, Cells of the immune system, Tissues of the immune system, Antibody structure, Antibody function, T cell receptors and MHC, The complement system, The immune response, Immunopathology.

Assessment: All assessments are compulsory.

## BIO-ANALYTICAL CHEMISTRY 1

Pre-requisites: Chemistry 1

Course outline: Acid base theory. Acid base titrations. Volumetric analysis. Gravimetric analysis. Compleximetric analysis. Precipitation titrations. Redox titrations. Separation techniques. Chromatography.

Assessment: All assessments are compulsory.

## MICROBIOLOGY 2A

Pre-requisites: Microbiology 1

Course outline: Stock culture, Preservation, Physical and chemical factors affecting microbial growth, Microbial ecology, Viruses, Introduction to bacterial structure, Introduction to fungal structure, Pathogen testing. Structure and function of prokaryotic cells, Classification and identification of bacteria, industrially significant bacteria and fungi, Measurement of bacterial growth in a broth.

Assessment: All assessments are compulsory.

## OPERATIONS MANAGEMENT

Pre-requisites: None

Course outline: Operations and Productivity; Operations management (OM); Operations strategy in a Global environment (biotechnology); Forecasting; Product development; Product documentation and Planning; Supply chain management; Inventory management; Business Location and Layout strategies; Material requirements planning (MRP) and Just-in-Time; The JIT partnerships; Lean production systems; Managing quality.

Assessment: All assessments are compulsory.

## BIOPROCESSING 2A

Pre-requisites: Mathematics, Microbiology 1

Course outline: Pre-requisites: This subject is based on prior knowledge of Microbiology, Chemistry 1, Biochemistry 2, Physics for Biotechnologist 1 and Mathematics, Biotechnology Industries and fermentation technology; Equipment, instrumentation and growth media, etc. Microorganisms (Revision); Directed evolution; Growth/death rate kinetics; Fermenter Selection and design and construction, Fermenter design; Preparation and operation of Fermentation systems (Big vessels); Process control (Instrumentation, Probes etc); Inoculum development, Storage and Inoculation; Nutrient medium design and selection for industrial fermenters; Downstream processes; Mass (oxygen) transfer and heat generation in fermenters; Fermenter scale-up; GMP, GLP, GCPqA.

Assessment: All assessments are compulsory.

## **BIOCHEMISTRY 2A**

Pre-requisites: Chemistry 1, Microbiology 1, Biochemistry 1

Course outline: Fermentation, Respiration, Chemolithotrophs & chemoheterotrophs, photoautotrophs & photoheterotrophs, Nitrogen fixation, Protein metabolism, Carbohydrate metabolism, Lipid metabolism.

Assessment: All assessments are compulsory.

## **MICROBIOLOGY 2B**

Pre-requisites: Microbiology 1, Microbiology 2A

Course outline: Section 1: Major bacterial and fungal groups; Microbial food spoilage; Groups of microbes important in the food; Food borne disease; Detection of microbes in foods; Control of microbes in foods; HACCP and associated PRPs; Section 2: Viruses and prions; The viral genome Viral reproduction, culture and purification; Viruses of bacteria and archaea; Prions, virusoids; HIV.

Assessment: All assessments are compulsory.

## **BIOPROCESSING 2B**

Pre-requisites: Bioprocessing 2A

Course outline: Regulatory bodies and constraints; Introduction to engineering calculations; General Stoichiometry for biological systems – Combustion; Material and Energy balances - Law of conservation of mass in process engineering; Heat transfer –g; Reactions and Reactor Engineering- Basic biological reaction theory.

Assessment: All assessments are compulsory.

## **MOLECULAR BIOLOGY TECHNIQUES**

Pre-requisites: Microbiology 1, Microbiology 2A

Course outline: Introduction to molecular biology and recombinant DNA technology. Section 1: Brief revision – Structure and expression of genetic material; control of prokaryotic gene expression. Section 2: Genetic diversity, mutation and selection. Selection/isolation of mutants; DNA repair in prokaryotes. Section 3: Recombinant DNA technology, History of RDT. RDT techniques – Genomic and plasmid DNA isolation, RE analysis, agarose gel electrophoresis, molecular cloning, PCR, RT-PCR, sequencing. Section 4: Current topics in molecular biology – Introductory Bioinformatics, Microarrays, RNA silencing.

Assessment: All assessments are compulsory.

## **BIO-ANALYTICAL CHEMISTRY 2**

Pre-requisites: Biochemistry 1, Bio-analytical Chemistry 1

Course outline: The separation of small and macromolecules on both the analytical and preparative levels using techniques such as HPLC, microbore HPLC, GLC, capillary electrophoresis, and 2D electrophoresis. Including DNA, RNA and protein isolation and separation techniques. Chromatography (column, polar, gas, liquid), Spectrophotometry (infrared, uv, vis), Spectroscopy, Polarimetry and Refractometry.

Assessment: All assessments are compulsory.

## **BIOTECHNOLOGY WORKPLACE PREPAREDNESS**

Pre-requisites: All S1 – S3 subjects

Course outline: Students have to demonstrate the ability to function in a variety of biotechnology-related sectors using the core practical skills covered in year 1 and 2 of the Diploma (Workplace learning).

Assessment: All assessments are compulsory.



## **BIOTECHNOLOGY WORKPLACE-BASED LEARNING**

---

Pre-requisites: Microbiology 2B, Bioprocessing 2B, Molecular Biology Techniques, Bio-Analytical Chemistry 2, Biotechnology Workplace Preparedness

---

Course outline: To demonstrate the ability to function in a variety of biotechnology related sectors using the core practical skills covered in yr 1 and 2 of the Diploma. (Workplace learning)

---

Assessment: All assessments are compulsory.

---

## **APPLIED BIOTECHNOLOGY**

---

Pre-requisites: Microbiology 2B, Bioprocessing 2B, Molecular Biology Techniques, Bio-Analytical Chemistry 2, Biotechnology Workplace Preparedness

---

Course outline: To be able to communicate scientific related concepts in a manner in which non-scientist and managers can understand. E-learning – case studies in different labs or areas, so they have broad exposure to different fields. Face-to-face contact time. Two other alternative areas of research to show transfer of technology and skills will be included.

---

Assessment: All assessments are compulsory.

---

## **RESEARCH METHODOLOGY: INTRODUCTION**

---

Pre-requisites: Microbiology 2B, Bioprocessing 2B, Molecular Biology Techniques, Bio-Analytical Chemistry 2, Biotechnology Workplace Preparedness

---

To be able to generate support and market new ideas such that decision makers can make informed choices. Research proposal.

---

Assessment: All assessments are compulsory.

---

## **BIOTECHNOLOGY INTEGRATED PROJECT**

---

Pre-requisites: Microbiology 2B, Bioprocessing 2B, Molecular Biology Techniques, Bio-Analytical Chemistry 2, Biotechnology Workplace Preparedness

---

Course outline: To have the required skills to source, evaluate and effectively translate that information gathered to solve biotechnological problems. To communicate using current tools in a public forum with a wide audience. To be able to generate support and market new ideas such that decision makers can make informed choices. Written report and oral presentation.

---

Assessment: All assessments are compulsory.

---

## DIPLOMA IN CONSUMER SCIENCE IN FOOD AND NUTRITION

### COURSE AIM

The purpose of the Diploma in Consumer Science in Food and Nutrition is to deliver graduates who will be able to combine science-based food and nutrition knowledge and culinary skills in fresh convenience food production, food retail and food service with the aim of promoting consumer well-being.

### PURPOSE AND RATIONALE OF THE QUALIFICATION

Access to healthy and safe food is high on the national agenda. This has necessitated the need for qualified graduates with a sound knowledge of both food and nutrition. This course is unique in its integration of the study fields of food and nutrition and that theoretical learning is complemented by the development of culinary skills. Consumers are becoming more aware of the relationship between lifestyle choices and health and this has led to a demand for healthy, fresh convenience food products.

### CAREER OPPORTUNITIES

A wide choice of career destinations in the fresh convenience food production industry and in food retail and food service is offered. Former students are working in test kitchens: formulating and developing recipes for food production, training employees in retail and food production companies, implementing quality control systems, advising consumers on food and nutrition products, managing the production of convenience food products, supervising food retail departments and managing food service facilities.

Students also have the background to become entrepreneurs as the knowledge and skills needed to start an own business is developed by combining business subjects with food and nutrition knowledge and culinary skills.

### ADMISSION REQUIREMENTS

For the minimum admission requirements, see admission requirements.

### DURATION

Full-time: Three years, including a minimum of three months' Workplace-based Learning/Work Integrated Learning (WIL)

### VENUE

District Six Campus

## DIPLOMA IN CONSUMER SCIENCE IN FOOD AND NUTRITION

QUALIFICATION CODE: D3CSFN

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	Year	FAH150S	Food: Science and Practice 1	C		5	30	0,250	Continuous	Yes
1	Year	NUT150S	Nutrition 1	C		5	24	0,200	Continuous	Yes
1	Year	FPO150S	Food Production and Service Operations 1	C		5	20	0,167	Continuous	Yes
1	Year	PHA150S	Applied Sciences: Introduction	C		5	24	0,200	Continuous	Yes
1	Year	FCM150S	Food Communication	C		5	22	0,183	Continuous	Yes
2	Year	FAH260S	Food: Science and Practice 2	C	FAH150S	6	30	0,250	Continuous	Yes
2	Year	NUT260S	Nutrition 2	C	NUT150S	6	24	0,200	Continuous	Yes
2	Year	FPO260S	Food Production and Service Operations 2	C	FPO150S	6	24	0,200	Continuous	Yes
2	Year	FMQ250S	Food Microbiology and Quality Control	C		5	24	0,200	Continuous	Yes
2	Year	COU250S	Consumer Retailing	C		5	18	0,150	Continuous	Yes
3	Year	FAH360S	Food: Science and Practice 3	C	FAH260S	6	30	0,250	Continuous	Yes
3	Year	NUT360S	Nutrition 3	C	NUT260S	6	30	0,250	Continuous	Yes
3	Year	FPO360S	Food Production and Service Operations 3	C	FPO260S	6	30	0,250	Continuous	Yes
3	Year	AFP360S	Applied Food and Nutrition Practice 3	C	FAH360S NUT360S	6	30	0,250	Continuous	Yes

## DIPLOMA IN CONSUMER SCIENCE IN FOOD AND NUTRITION (EXTENDED PROGRAMME)

**QUALIFICATION CODE: D3CNSX**

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	Year	FCM150X	Food Communication	C		5	22	0,150	Continuous	Yes
1	Year	PHA150X	Applied Sciences: Introduction	C		5	24	0,170	Continuous	Yes
1	Year	FPO150S	Food Production and Service Operations 1	C		5	20	0,175	Continuous	Yes
2	Year	FAH150X	Food: Science and Practice 1	C		5	30	0,210	Continuous	Yes
2	Year	NUT150X	Nutrition 1	C		5	24	0,170	Continuous	Yes
2	Year	COU250S	Consumer Retailing	C		5	18	0,160	Continuous	Yes
3	Year	FAH260S	Food: Science and Practice 2	C	FAH150X	6	30	0,266	Continuous	Yes
3	Year	NUT260S	Nutrition 2	C	NUT150X	6	24	0,215	Continuous	Yes
3	Year	FPO260S	Food Production and Service Operations 2	C	FPO150S	6	24	0,215	Continuous	Yes
3	Year	FMQ250S	Food Microbiology and Quality Control	C		5	24	0,215	Continuous	Yes
4	Year	FAH360S	Food: Science and Practice 3	C	FAH260S	6	30	0,268	Continuous	Yes
4	Year	NUT360S	Nutrition 3	C	NUT260S	6	30	0,268	Continuous	Yes
4	Year	FPO360S	Food Production and Service Operations 3	C	FPO260S	6	30	0,268	Continuous	Yes
4	Year	AFP360S	Applied Food and Nutrition Practice 3		FAH360S NUT360S	6	30	0,250	Continuous	Yes

## BACCALAUREUS TECHNOLOGIAE (B TECH): CONSUMER SCIENCE: FOOD AND NUTRITION

### COURSE AIM

The aim of the B Tech: Consumer Science: Food and Nutrition is to deliver graduates who would be able to develop food products based on knowledge of food science principles, food product development theory and practice and sound nutritional principles.

### PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose is to enhance the quality of life of the consumer. Graduates will be able to work as part of a food and nutrition research team applying the principles of research methodology in a food or food-related field.

### CAREER OPPORTUNITIES

Former students are employed as food product developers, product or technical representatives, food promotion consultants and positions in food research and development. Further career prospects are similar to those of the Diploma but with better opportunities for advancement in research and managerial positions.

### ADMISSION REQUIREMENTS

For the minimum admission requirements, see admission requirements.

### DURATION

Full-time: One year

### VENUE

District Six Campus

## BACCALAUREUS TECHNOLOGIAE: CONSUMER SCIENCE: FOOD AND NUTRITION

**QUALIFICATION CODE: BTCSFN**

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
4	Year	MAK100S	Marketing 1	C		7	12	0.100	Continuous	Yes
4	Year	FNP400S	Food and Nutrition Project 4	C		7	36	0.300	Continuous	Yes
4	Year	RMN200S	Research Methodology: Natural Sciences	C		7	12	0.100	Continuous	Yes
4	Year	FAH400S	Food and Food Science 4	C	FAH300S	7	36	0.300	Continuous	Yes
4	Year	NUT400S	Nutrition 4	C	NUT300S	7	24	0.200	Continuous	Yes

## MASTER OF CONSUMER SCIENCE IN FOOD AND NUTRITION

**QUALIFICATION CODE: MGCSFR**

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
5	Year	CSF690R	Research Project and Dissertation	C		9	180	0.1000	Continuous	Thesis

## DIPLOMA SUBJECTS: CONSUMER SCIENCE IN FOOD AND NUTRITION

Note that the information provided below is only a short summary – please refer to the respective Subject Guides for more detail.

### YEAR 1

#### **FOOD: SCIENCE AND PRACTICE 1**

---

Pre-requisites: None

---

Includes a theoretical and a practical component. In the theory the focus is on the structure, composition, processing and quality characteristics of the following food commodities: foods of plant origin (cereals, grains, fruit, vegetables, legumes and oil seeds) and of animal origin (eggs, dairy, meat, poultry and fish). In addition the physical and chemical reactions, interactions and outcomes that occur during storage, preparation and cooking are studied. In the practical, food science principles and processes are applied in small-scale food production. It includes the development of culinary skills.

---

Assessment: All assessments are compulsory.

---

#### **NUTRITION 1**

---

Pre-requisites: None

---

Introduces human nutrition and helps students to understand the role of food in the maintenance of health. Includes the physiological functions the human body; their functions, requirements and dietary sources. It is divided into macronutrients (carbohydrates, lipids and proteins), micronutrients (vitamins, minerals and water), energy and food and nutrition guides (e.g. Food Group Guide, MyPyramid and Food-based Dietary Guidelines).

---

Assessment: All assessments are compulsory.

---

#### **FOOD PRODUCTION AND SERVICE OPERATIONS 1**

---

Pre-requisites: None

---

The emphasis is on cost/institutional catering and includes meal management: food selection, meal and menu planning. In additional functions, table setting, service styles and methods, décor and social etiquette are studied. It also includes a study of equipment used in food preparation, service and production.

---

Assessment: All assessments are compulsory.

---

#### **APPLIED SCIENCES: INTRODUCTION**

---

Pre-requisites: None

---

This subject is an introduction to the following three components: Physics, Inorganic Chemistry and Biochemistry. The various principles studied are applicable to the food processing environment. The physics component deals with measurements and electricity whereas inorganic chemistry involves the study of matter: acids, bases and salts. Biochemistry begins with the basics of organic chemistry, with emphasis on major functional groups, before dealing with carbohydrates, lipids and proteins. Practical sessions focus on measurements, acids and pH plus laboratory tests on proteins, sugars and carbohydrates.

---

Assessment: All assessments are compulsory.

---

## FOOD COMMUNICATION

---

Pre-requisites: None

---

The focus is on oral and written communication skills as required by the food industry. It includes reading skill strategies, information literacy, academic language proficiency, digital literacy and oral presentation skills. The computer skills section focuses on word processing and presentations.

---

Assessment: All assessments are compulsory.

---

## FOOD: SCIENCE AND PRACTICE 2

---

Pre-requisites: Food: Science and Practice 1

---

Includes a theoretical and a practical component. In the theory the following topics are studied: baked products, beverages, confectionary, preservation and processing methods. The focus is the structure, composition, and quality characteristic of these topics. In addition physical and chemical reactions, interactions and outcomes that occur during storage, preparation and cooking/baking are included. In the practical application food science principles and processes are applied in small-scale food production, with the emphasis on experimentation and the development of advanced culinary skills.

---

Assessment: All assessments are compulsory.

---

## NUTRITION 2

---

Pre-requisites: Nutrition 1

---

The nutritional needs and dietary practices required for the maintenance and promotion of wellness throughout the life cycle are studied. Nutritional status assessment, allergies and intolerances and weight management are included. In addition, world food and nutrition problems and South African food choices and dietary habits are studied. Practical application sessions focuses on meal and menu planning.

---

Assessment: All assessments are compulsory.

---

## FOOD PRODUCTION AND SERVICE OPERATIONS 2

---

Pre-requisites: Food Production and Service Operations 1

---

Food science and culinary principles and skills are applied in the production of convenience food products. Food production and service systems, the compilation of product and process specifications, the selection, sourcing, storage and control of food commodities and an introduction to management; focusing on the role of the supervisor in a food production and a food service facility are included. In the practical sessions recipes are standardized and a production session is planned and executed.

---

Assessment: All assessments are compulsory.

---

## CONSUMER RETAILING

---

Pre-requisites: None

---

The retail industry is studied as part of an economic system. In retailing organization housekeeping management and operations management are emphasized. The focus is further on understanding consumers as individuals and as members of groups. The various factors influencing behavior are included.

---

Assessment: All assessments are compulsory.

---

## FOOD MICROBIOLOGY AND QUALITY CONTROL

---



Pre-requisites: None

The classification, identification and growth of micro-organisms are studied. Attention is given to fermentation systems, food spoilage and food-borne disease. Personal, operational and environmental hygiene, and legislation form the background to food safety systems, i.e. hazard analysis and critical control points (HACCP).

Assessment: All assessments are compulsory.

### **FOOD: SCIENCE AND PRACTICE 3**

Pre-requisite: Food: Science and Practice 2

The course consists of a theoretical and practical component. In the theory South African and international cultural perspectives of food and present trends are studied. Also included are the theory of recipe development, an introduction to food additives, packaging and food legislation and the principles of sensory evaluation. In the practical application food science principles, processes and culinary skills are applied in recipe development for small-scale food production with the emphasis on fresh, convenience food products. In the second semester students are involved in project based learning.

Assessment: All assessments are compulsory.

### **NUTRITION 3**

Pre-requisites: Nutrition 2

The nutritional needs and dietary practices required for the prevention of chronic diseases related to lifestyle are studied. This includes nutritional disorders, alternative feeding practices and labelling legislation. The practical application of the subject focuses on meal and menu planning for specific chronic lifestyle diseases. In the second semester students are involved in project based learning.

Assessment: All assessments are compulsory.

### **FOOD PRODUCTION AND SERVICE OPERATIONS 3**

Pre-requisites: Food Production and Service Operations 2

This subject includes an introduction to the world of business. Managerial and entrepreneurial principles are studied and applied in food production and food service. Students are provided with the tools to start a small business; starting from the formulation of ideas, finding a niche in the market and translating it to food products as well as business finances and administration. In the practical application of the subject students are involved in a food entrepreneurial project.

Assessment: All assessments are compulsory.

### **APPLIED FOOD AND NUTRITION PRACTICE 3**

Co-requisites: Food: Science and Practice 3 and Nutrition 3

During the first semester students are prepared for Work Integrated Learning (WIL) by providing them with an understanding of human behaviour. This will assist them in managing themselves in the workplace as it includes self-management, interpersonal relationships (handling stress, conflict and cultural diversity), ethics and behaviour in the workplace. The practical application includes: Compiling a CV, applying for a position and preparing for an interview. During the second semester students are involved in three month Workplace-based Learning. The aim of this is to give students, through exposure and guidance, the opportunity to familiarize them with a specific food industry sector, namely, convenience food production, food retail or food service. Knowledge and skills gained during their studies are applied. Personal characteristics such as responsibility and accountability, carrying out tasks with confidence, participating in effective problem solving and operating effectively in a team relationship are emphasized.

**ASSESSMENT STRATEGY:**

In all subjects a system of outcomes based continuous assessment comprising regular formative and summative assessment opportunities is used. Formative assessments take place during the process of teaching and learning and have as its purpose the development of students' abilities. Summative assessment is used to determine if the subject learning outcomes have been achieved.

Subject content, based on outcomes, is divided into units of learning. Each unit is assessed by two or more moderated, summative assessment opportunities (e.g. theory tests, practical tests, individual assignments, group projects, etc.).

Students not achieving 50% for a learning unit are given one additional assessment opportunity to enable them to reach the outcomes. The final learning unit comprises a final integrated summative assessment (FISA).

## B TECH SUBJECTS: CONSUMER SCIENCE: FOOD AND NUTRITION

Note that the information provided below is only a short summary – please refer to the respective Subject Guides for more detail.

### **FOOD AND FOOD SCIENCE 4**

Pre-requisites: Food and Food Science 3

The theory and practical application of product development, with specific emphasis on sensory evaluation, is studied. Quality management systems are also emphasised.

Assessment: All assessments are compulsory.

### **NUTRITION 4**

Pre-requisites: Nutrition 3

The subject covers specific nutrient deficiencies that affect the South African population, considering the impact on health status and potential strategies to reduce the development of nutrient deficiencies. It also focuses on bioactive food ingredients usage to reduce the risk of non-communicable diseases and specific dietary- related disorders.

Assessment: All assessments are compulsory.

### **RESEARCH METHODOLOGY: NATURAL SCIENCES**

Pre-requisites: None

The basic principles of research are covered to equip students with the ability to plan and undertake a research project, collect and analyse data and apply a scientific style of writing in the written presentation of research.

Assessment: All assessments are compulsory.

### **FOOD AND NUTRITION PROJECT 4**

Pre-requisites: Research Methodology: Natural Sciences, Food and Food Science 3 and Nutrition 3

Students undertake a food/food-related research project individually or in groups under guidance in the field of consumer science: food and nutrition.

Assessment: All assessments are compulsory.

### **MARKETING 1**

Pre-requisites: None

Course outline: The fundamentals of marketing are introduced.

Assessment: All assessments are compulsory.

**ASSESSMENT STRATEGY:**

In all subjects a system of outcomes based continuous assessment comprising regular formative and summative assessment opportunities is used. Formative assessments take place during the process of teaching and learning and have as its purpose the development of students' abilities. Summative assessment is used to determine if the subject learning outcomes have been achieved.

Subject content, based on outcomes, is divided into units of learning. Each unit is assessed by two or more moderated, summative assessment opportunities (e.g. theory tests, practical tests, individual assignments, group projects, etc.).

Students not achieving 50% for a learning unit are given one additional assessment opportunity to enable them to reach the outcomes. The final learning unit comprises a final integrated summative assessment (FISA).

## DEPARTMENT OFFICE-BEARERS

POSITION	NAME	TELEPHONE	FAX	E-MAIL
Dr R Toefy	HOD	021 460 8312	021 460 3217	toefyr@cput.ac.za
Mrs F Adams	Administrative Assistant	021 460 3190	021 460 3217	Adamsfa@cput.ac.za

## ACADEMIC STAFF

POSITION	NAME	QUALIFICATIONS
<b>HOD</b>	Dr R Toefy	BSc (Zoology), HDE, BSc Hons, MSc, PhD (Zoology)
<b>Associate Professor</b>	Prof RG Snyman	BSc (Agriculture), BSc Hons, MSc, PhD (Zoology)
<b>Associate Professor</b>	Prof S Geerts	BSc, BSc Hons, MSc, PhD
<b>Senior Lecturer</b>	Dr FGT Radloff	BSc (Agriculture), BSc Hons, MSc, PhD (Botany)
<b>Senior Lecturer</b>	Dr CA Sparks	BSc (Education), BSc Hons, MSc, D Tech Environmental Health
<b>Lecturer</b>	Dr I Halo	BSc (Oceanography), BSc (Hons), MSc, PhD (Oceanography)
<b>Lecturer</b>	Dr DR Walker	BSc, BSc Hons, HDE, MSc, PhD
<b>Lecturer</b>	Mr S Ntuli	BSc, BSc Hons, MSc
<b>Lecturer</b>	Mrs C Harkins	BSc, BSc Hons, MSc, MPhil Marine and Environmental Law

## QUALIFICATIONS OFFERED

Undergrad or Post Graduate	Qualification Type	Qualification Code	Qualification Name	Campus offered	Minimum Duration (Years)	Maximum Duration (Years)
Undergrad	Diploma	D3NCNS	Diploma in Nature Conservation	District 6	3	6
Undergrad	Diploma	D3NCNX	Diploma in Nature Conservation (Extended)	District 6	4	7
Postgrad	Baccalaureus Technologiae	BTNCNS	BTech: Nature Conservation	District 6	2	4
Postgrad	Masters	MGNCNR	Master of Conservation Science	District 6	2	5
Undergrad	Diploma	DPMASC	Diploma in Marine Science	District 6	3	6
Undergrad	Diploma	DPMASX	Diploma in Marine Science	District 6	4	7

Undergrad	Baccalaureus Technologiae	BTOCNG	BTech: Oceanography	District 6	1	2
Postgrad	Magister Technologiae	MTOCNR	MTech: Oceanography	District 6	2	4

## DIPLOMA: NATURE CONSERVATION

### COURSE AIM

The aim of this course is to provide students with the skills to succeed in a rapidly-changing nature conservation environment where innovation is key. Graduates are equipped with a comprehensive range of technical, managerial, research, communication and life skills for employment in the field of nature conservation. The Diploma Nature Conservation lays the foundation for further study towards the B Tech Nature Conservation and ultimately the Masters of Conservation Science.

### PURPOSE AND RATIONALE OF THE QUALIFICATION

The purpose of this qualification is to supply the nature conservation industry with people who can competently contribute to the conservation of biodiversity and provide knowledgeable assistance to natural resource managers. The graduates will have the requisite knowledge of the natural environment and its dynamic relationship with humans, various approaches to conservation and sustainable use, and competence in research and monitoring techniques.

### CAREER OPPORTUNITIES

Graduates can pursue careers in the areas of management of natural resources/ protected areas, alien species control, environmental policy compliance, environmental education, research, field guiding, and Ecotourism.

### ADMISSION REQUIREMENTS

For the minimum admission requirements, see admission requirements.

English level 4 ( $\geq 50\%$ ); Mathematics level 3 ( $\geq 40\%$ ) OR Mathematical Literacy level 5 ( $\geq 60\%$ ); Life Sciences level 4 ( $\geq 50\%$ ); Any THREE additional subjects at level 3 (except Life Orientation)

### PROFESSIONAL REGISTRATION

Not applicable

### DURATION

Full-time: Three years, including one year of Work Integrated Learning.

### VENUE

District Six Campus

## DIPLOMA: NATURE CONSERVATION

QUALIFICATION CODE: D3NCNS

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	1st Sem	CNC150S	Conservation Communication	C		5	12	0.100	Continuous	Yes
1	1st Sem	ANS150S	Animal Studies 1A	C		5	12	0.100	Continuous	Yes
1	1st Sem	COF150S	Computer Applications	C		5	12	0.100	Continuous	Yes
1	1st Sem	BOT152S	Plant Studies 1A	C		5	12	0.100	Continuous	Yes
1	1st Sem	NCE150S	Conservation Ecology 1A	C		5	12	0.100	Continuous	Yes
1	2nd Sem	REM150S	Biodiversity Management 1B	C		5	12	0.100	Continuous	Yes
1	2nd Sem	ANS151S	Animal Studies 1B	C	ANS150S	5	12	0.100	Continuous	Yes
1	2nd Sem	NCD150S	Principles of Conservation	C		5	12	0.100	Continuous	Yes
1	2nd Sem	BOT153S	Plant Studies 1B	C	BOT152S	5	12	0.100	Continuous	Yes
1	2nd Sem	NCE160S	Conservation Ecology 1B	C	NCE150S	6	12	0.100	Continuous	Yes
2	1st Sem	REM260S	Biodiversity Management 2A	C	REM150S	6	12	0.100	Continuous	Yes
2	1st Sem	NCE260S	Conservation Ecology 2	C	NCE160S	6	15	0.125	Continuous	Yes
2	1st Sem	SSC250S	Soil Conservation	C		5	12	0.100	Continuous	Yes
2	1st Sem	BOT260S	Plant Studies 2	C	BOT153S	6	15	0.125	Continuous	Yes
2	2nd Sem	CSP250S	Conservation Practice 2A	C		5	12	0.100	Continuous	Yes
2	2nd Sem	CSP251S	Conservation Practice 2B	C		5	15	0.100	Continuous	Yes
2	2nd Sem	CTE260S	Conservation Extension 2	C	CNC150S	6	12	0.100	Continuous	Yes
2	2nd Sem	ANS260S	Animal Studies 2	C	ANS151S	6	15	0.125	Continuous	Yes
2	2nd Sem	REM261S	Biodiversity Management 2B	C	REM260S	6	15	0.125	Continuous	Yes
3	Year	CVR360S	Conservation Research 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
3	Year	REM360S	Biodiversity Management 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
3	Year	CCP360S	Conservation Compliance	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
3	Year	CTE360S	Conservation Extension 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
3	Year	NCA360S	Conservation Administration 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
3	Year	BEW360S	Conservation Practice 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	30	0.250	Continuous	Project



## DIPLOMA NATURE CONSERVATION EXTENDED CURRICULUM PROGRAMME (ECP):

QUALIFICATION CODE: D3NCNX

### DURATION

Full-Time: Four years, including one year of Work Integrated Learning. The first year of study is extended over two years.

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	Year	COF150X	Computer Applications	C		5	12	0.070	Continuous	Yes
1	1st Sem	CNC150X	Conservation Communication	C		5	12	0.070	Continuous	Yes
1	1st Sem	ANS150X	Animal Studies 1A	C		5	12	0.120	Continuous	Yes
1	2nd Sem	ANS151X	Animal Studies 1B	C	ANS150X	5	12	0.120	Continuous	Yes
1	2nd Sem	REM150X	Biodiversity Management 1B	C		5	12	0.100	Continuous	Yes
2	1st Sem	BOT152X	Plant Studies 1A	C		5	12	0.110	Continuous	Yes
2	1st Sem	NCE150X	Conservation Ecology 1A	C		5	12	0.110	Continuous	Yes
2	2nd Sem	NCD150S	Principles of Conservation	C		5	12	0.100	Continuous	Yes
2	2nd Sem	BOT153S	Plant Studies 1B	C	BOT152X	5	12	0.100	Continuous	Yes
2	2nd Sem	NCE160S	Conservation Ecology 1B	C	NCE150X	6	12	0.100	Continuous	Yes
3	1st Sem	REM260S	Biodiversity Management 2A	C	REM150X	6	12	0.100	Continuous	Yes
3	1st Sem	NCE260S	Conservation Ecology 2	C	NCE160S	6	15	0.125	Continuous	Yes
3	1st Sem	SSC250S	Soil Conservation	C		6	12	0.100	Continuous	Yes
3	1st Sem	BOT260S	Plant Studies 2	C	BOT153S	6	15	0.125	Continuous	Yes
3	2nd Sem	CSP250S	Conservation Practice 2A	C		5	12	0.100	Continuous	Yes
3	2nd Sem	CSP251S	Conservation Practice 2B	C		5	15	0.100	Continuous	Yes
3	2nd Sem	CTE260S	Conservation Extension 2	C	CNC150S	5	12	0.100	Continuous	Yes
3	2nd Sem	ANS260S	Animal Studies 2	C	ANS151S	6	15	0.125	Continuous	Yes
3	2nd Sem	REM261S	Biodiversity Management 2B	C	REM260S	6	15	0.125	Continuous	Yes
4	Year	CVR360S	Conservation Research 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
4	Year	REM360S	Biodiversity Management 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
4	Year	CCP360S	Conservation Compliance	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
4	Year	CTE360S	Conservation Extension 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project
4	Year	NCA360S	Conservation Administration 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	18	0.150	Continuous	Project

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
4	Year	BEW360S	Conservation Practice 3	C	All 1 <sup>st</sup> & 2 <sup>nd</sup> yr subjects	6	30	0.250	Continuous	Project

## BACCALAUREUS TECHNOLOGIAE: NATURE CONSERVATION

### QUALIFICATION CODE: BTNCNS

Admission requirements: Diploma or equivalent qualification in Nature Conservation with an average of 60% for the major subjects.

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
4	Year	BOT400S	Plant Studies 4	C		7	36	0.300	Continuous	Yes
4	Year	REM400S	Resource Management 4	C		7	36	0.300	Continuous	Yes
4	Year	REA101S	Research Methodology 1	C		7	12	0.100	Continuous	Yes
4	Year	BBE100S	Conservation Management 1	C		7	12	0.100	Continuous	Yes
4	Year	BBS100S	Principles of Management 1	C		7	12	0.100	Continuous	Yes
4	Year	KMB100S	Coastal and Marine Management 1	C		7	12	0.100	Continuous	Yes

## MASTER OF CONSERVATION SCIENCE

### QUALIFICATION CODE: MGNCNR

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
5	Year	R1M5059	Research Project and Dissertation	C		9	180	1.000	Project	Thesis

## DIPLOMA SUBJECTS: NATURE CONSERVATION

Note that the information provided below is only a short summary – please refer to the respective Subject Guides for more detail.

### PLANT STUDIES 1A

---

Pre-requisites: None

---

Course Outline: Introduction to plant cells, plant tissues (permanent and complex), physiological processes such as photosynthesis and transpiration, and evolution/systematics of the plant kingdom

---

Assessment: All assessments are compulsory.

---

### PLANT STUDIES 1B

---

Pre-requisites: Plant Studies 1A

---

Course outline: Principles of taxonomy as well as a selected number of flowering families, both monocotyledonous and dicotyledonous families

---

Assessment All assessments are compulsory.:

---

### PLANT STUDIES 2

---

Pre-requisites: Plant Studies 1A & 1B

---

Course outline: the fundamental principles and methods used in the identification, classification and description of plant communities, as well as veld evaluation and vegetation monitoring. Also the impacts and control methods of alien invasive plant species, fire management and threatened plant species management

---

Assessment: All assessments are compulsory.

---

### ANIMAL STUDIES 1A

---

Pre-requisites: None

---

Course outline: History of life: origin of the earth and life on earth. Comparative evolutionary survey of the Invertebrata.

---

Assessment: All assessments are compulsory.

---

### ANIMAL STUDIES 1B

---

Pre-requisites: Animal Studies 1A

---

Course outline: Origin of Phylum Chordata and evolutionary survey of each of the vertebrate classes

---

Assessment: All assessments are compulsory.

---

### ANIMAL STUDIES 2

---

Pre-requisites: Animal Studies 1 & 1B

---

Course outline: Various aspects of animal behaviour, including food selection, home range, territoriality, mating systems, sexual selection, predator-prey interactions, thermoregulation. Ethology.

---

Assessment: All assessments are compulsory.

---

## **CONSERVATION ECOLOGY 1A**

Pre-requisites: None

Course outline: Dynamics of natural populations of animals and plants; life table analysis and population growth models; regulation of population size; different life history strategies as adaptations for population persistence; interactions between species in ecological communities; competition between species within trophic levels; predator-prey, parasite host, plant herbivore interactions across trophic levels; communities, food webs as flows of energy and nutrients; ecosystem structure and function

Assessment: All assessments are compulsory.

## **CONSERVATION ECOLOGY 1B**

Pre-requisites: Conservation Ecology 1A

Course outline: Aquatic Ecology. Freshwater, estuarine and marine ecosystems

Assessment: All assessments are compulsory.

## **CONSERVATION ECOLOGY 2**

Pre-requisites: Conservation Ecology 1A & 1B

Course outline: Biomes of the world and South Africa. Pollination and Population Genetics

Assessment: All assessments are compulsory.

## **BIODIVERSITY MANAGEMENT 1B**

Pre-requisites: None

Course outline: Introduction to the scientific approach and basic statistics for biology.

Assessment: All assessments are compulsory.

## **BIODIVERSITY MANAGEMENT 2A**

Pre-requisites: Biodiversity Management 1B

Management principles of freshwater and marine environments, including health assessment, monitoring, environmental impact assessments. The use of aquaculture in conservation, as well as the effects thereof on the environment. Introduction to ecotoxicology

Assessment: All assessments are compulsory.

## **BIODIVERSITY MANAGEMENT 2B**

Pre-requisites: Biodiversity Management 1B & 2A

Course outline: the principles and application of protected area planning and management with a specific focus on wildlife management,

Assessment: All assessments are compulsory.

## **COMPUTER APPLICATIONS**

Pre-requisites: None

Course outline: End-user computing, i.e. competent use of computer hardware and software for word processing, spreadsheets and presentations.

Assessment: All assessments are compulsory.

## CONSERVATION COMMUNICATION

Pre-requisites: None

Course outline: Academic reading and writing; Communication theory; inter-personal communication; work-place communication

Assessment: All assessments are compulsory.

## CONSERVATION EXTENSION 2

Pre-requisites: Conservation Communication

Course outline: Environmental Education, Community & urban Conservation, Field guiding, Diversity Management.

Assessment: All assessments are compulsory.

## PRINCIPLES OF CONSERVATION

Pre-requisites: None

Course outline: Origin, history, philosophy, principles and practice of conservation locally, nationally and internationally

Assessment: All assessments are compulsory.

## SOIL CONSERVATION 1

Pre-requisites: None

Course outline: Soil formation, Soil texture, soil structure, soil profiles, nutrient and water retention in soil, CEC and factors affecting it, soil analysis, soil rehabilitation, soil biodiversity, soil erosion

Assessment: : All assessments are compulsory.

## CONSERVATION PRACTICE 2A

Pre-requisites: None

Course outline: Frameworks for Biodiversity Conservation

Short courses: Fire management (Basic) & First aid (Level 1). Conservation Organisations: Structures, Mandates and Responsibilities. Basic Financial Administration. Field techniques. Animal care and capture.

Assessment: All assessments are compulsory.

## CONSERVATION PRACTICE 2B

Pre-requisites: None

Course outline: Legislative process and constitution. Relevant aspects of conservation-related legislation and compliance procedures; Project Management.

Assessment: All assessments are compulsory.

## WORK INTEGRATED LEARNING

### CONSERVATION RESEARCH 3

Pre-requisites: All First and Second Year subjects

Course outline: Identify, plan and execute an appropriate and relevant nature conservation research project, and produce a scientific report on the research

Assessment: Research project

### BIODIVERSITY MANAGEMENT 3

Pre-requisites: All First and Second Year subjects

Course outline: Plan, execute, report and evaluate resource management related activities in the following fields, and produce a project report in the prescribed format:

- a) Vegetation monitoring and management: Surveys, restoration, rehabilitation, cultivation, invasive plant control and fire.
- b) Wildlife monitoring and management: Surveys, population control, human-animal conflict management
- c) Soil monitoring and management: Surveys and erosion control
- d) Water monitoring and management: Infrastructure maintenance, water availability and quality assessments, water body protection and management.

Assessment: Project

### CONSERVATION COMPLIANCE

Pre-requisites: All First and Second Year subjects

Course outline: Plan, execute, report and evaluate resource management related activities in the following fields, and produce a project report in the prescribed format:

- a) Investigation and information gathering
- b) Permits and permit compliance
- c) Patrols and patrol management
- d) Inspections (permits, work sites, recreational activities, staff and contractors)

In addition, students must report involvement in any two of the following six fields of compliance expertise:

- Legal and illegal trade in fauna and flora
- Illegal commercial activities
- Illegal occupancy
- Environmental management plans
- Environmental impact assessment
- Visitor safety, security and risk management

Assessment: Project

### CONSERVATION EXTENSION 3

Pre-requisites: All First and Second Year subjects

Course outline: Plan, execute, report and evaluate conservation extension related activities in the following fields, and produce a project report in the prescribed format:

- a) Environmental education
- b) Community conservation
- c) Media and marketing (e.g. posters, presentations, exhibitions, brochures, newspaper articles, social media)
- d) Nature/ field guiding

Assessment: Project

## **CONSERVATION ADMINISTRATION 3**

---

Pre-requisites: All First and Second Year subjects

---

Course outline: Plan, execute, report and evaluate general administration and management related activities in the following fields, and produce a project report in the prescribed format:

- a) General administration and business communication: Asset registers, record keeping, filing, data base management, communication protocol (oral and written).
  - b) Infrastructure and asset management: Maintenance, construction and demolition.
  - c) Financial management: Revenue streams, budgets, salaries, banking and procurement procedures.
  - d) Self development and management: Skills development and training.
- 

Assessment: Project

---

## **CONSERVATION PRACTICE 3**

---

Pre-requisites: All First and Second Year subjects

---

Course outline: Students are engaged in all aspects of work in a Nature Conservation organisation/ enterprise (work place based learning).

---

Assessment: Workplace based assessment on competency in all aspects of day to day conservation practice

---

## DIPLOMA: MARINE SCIENCE

### COURSE AIM

This qualification intends to empower students to acquire knowledge, skills, attitudes and values required to operate confidently in the fields of marine science. Graduates will have the requisite levels of theoretical knowledge, understanding and practical proficiency to establish a successful career in the marine and related industries/sectors.

### PURPOSE AND RATIONALE OF THE QUALIFICATION

Graduates of this qualification will be skilled with competencies in marine science. Applications of theoretical and practical knowledge in marine science impact various aspects of the workplace in business, applied sciences and industries related to the marine sector. Rapid changes in the workplace, where new technologies are embraced for the industry to be more globally competitive, have increased the demand for technical skills where knowledge is applied to processes and operations across a number of marine science-based disciplines. The qualification in marine science seeks to bridge the skills gap in the marine science sector, and addresses the shortage of marine technicians and conservationists in the country.

### CAREER OPPORTUNITIES

Graduates in Marine Science can pursue technical careers in marine science, climate change, marine aquaculture, oceanography, environmental (marine and coastal) management, fisheries management, marine ecotourism, environmental education, marine pollution control, estuarine management and marine conservation.

### ADMISSION REQUIREMENTS

Minimum requirements: Mainstream: Physical Sciences 4, English 4, Mathematics 4, Life Sciences 4.

Extended curriculum programme: English 4, Life Sciences 4. Physical Sciences (45 % - 50% if Mathematics at level 4), Mathematics (45 % - 50% if Physical Science at level 4).

### PROFESSIONAL REGISTRATION

Not applicable

### DURATION

Full-time Three years, including 1 semester of Work Integrated Learning

### VENUE

District Six Campus



## DIPLOMA: MARINE SCIENCE

QUALIFICATION CODE: DPMASC

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	1st Sem	MAS150S	Marine Science I	C		5	12	0.100	Continuous	Yes
1	1st Sem	ECL150S	Ecology I	C		5	12	0.100	Continuous	Yes
1	1st Sem	KOT150S	Communication Skills I	C		5	12	0.100	Continuous	Yes
1	1st Sem	BMA150S	Biomathematics	C		5	12	0.100	Continuous	Yes
1	1st Sem	KOR151S	Computer Skills I	C		5	12	0.100	Continuous	Yes
1	2nd Sem	MAB150S	Marine Biology I	C		5	12	0.100	Continuous	Yes
1	2nd Sem	MAC150S	Marine Chemistry I	C		5	12	0.100	Continuous	Yes
1	2nd Sem	MPH150S	Marine Physics I	C		5	12	0.100	Continuous	Yes
1	2nd Sem	ECL160S	Ecology 2	C	ECL150S	6	12	0.100	Continuous	Yes
1	2nd Sem	PRM160S	Project Management I	C		6	12	0.100	Continuous	Yes
2	1st Sem	CSM250S	Coastal Management I	C		5	12	0.100	Continuous	Yes
2	1st Sem	MAS260S	Marine Science 2	C	MAS150S	6	12	0.100	Continuous	Yes
2	1st Sem	MAB260S	Marine Biology 2	C	MAB150S	6	12	0.100	Continuous	Yes
2	1st Sem	MRS260S	Marine Resource Management I	C		6	12	0.100	Continuous	Yes
2	1st Sem	MAP260S	Marine Pollution I	C		6	12	0.100	Continuous	Yes
2	2nd Sem	KOR260S	Computer Skills 2	C	KOR151S	6	12	0.100	Continuous	Yes
2	2nd Sem	CSM260S	Coastal Management 2	C	CSM250S	6	12	0.100	Continuous	Yes
2	2nd Sem	MAL260S	Marine Law I	C		6	12	0.100	Continuous	Yes
2	2nd Sem	MAQ250S	Marine Aquaculture I	C		5	12	0.100	Continuous	Yes
2	2nd Sem	MAT260S	Marine Technology	C		6	12	0.100	Continuous	Yes
3	1st Sem	ECL370S	Ecology 3	C	ECL160S	7	15	0.125	Continuous	Yes
3	1st Sem	MAB370S	Marine Biology 3	C	MAB260S	7	15	0.125	Continuous	Yes
3	1st Sem	BUS360S	Business Principles	C		6	12	0.125	Continuous	Yes
3	1st Sem	MAQ370S	Marine Aquaculture 2	E	MAQ250S	7	15	0.125	Continuous	Yes
3	1st Sem	MAL370S	Marine Law 2	E	MAL260S	7	15	0.125	Continuous	Yes
3	1st Sem	CSM370S	Coastal Management 3	E	CSM260S	7	15	0.125	Continuous	Yes
3	1st Sem	MAS370S	Marine Science 3	E	MAS260S	7	15	0.125	Continuous	Yes
3	2nd Sem	MSI360S	Marine Science Industry Practice 1	C	All theory subjects	6	48	0.400	Project	Yes

## DIPLOMA: MARINE SCIENCE EXTENDED CURRICULUM PROGRAMME (ECP)

**QUALIFICATION CODE: DPMASX**

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
1	Year	MAS150X	Marine Science I	C		5	12	0.100	Continuous	Yes
1	Year	KOT150X	Communication Skills I	C		5	12	0.100	Continuous	Yes
1	Year	BMA150X	Biomathematics	C		5	12	0.100	Continuous	Yes
1	Year	MAC150X	Marine Chemistry I	C		5	12	0.100	Continuous	Yes
1	Year	MPH150X	Marine Physics I	C		5	12	0.100	Continuous	Yes
2	1st Sem	ECL150X	Ecology I	C		5	12	0.100	Continuous	Yes
2	1st Sem	KOR151X	Computer Skills I	C		5	12	0.100	Continuous	Yes
2	1st Sem	CSM250S	Coastal Management I	C		5	12	0.100	Continuous	Yes
2	2nd Sem	MAB150X	Marine Biology I	C		5	12	0.100	Continuous	Yes
2	2nd Sem	ECL160X	Ecology 2	C	ECL150X	6	12	0.100	Continuous	Yes
2	2nd Sem	PRM160S	Project Management I	C		6	12	0.100	Continuous	Yes
3	1st Sem	MAS260S	Marine Science 2	C	MAS150X	6	12	0.100	Continuous	Yes
3	1st Sem	MAB260S	Marine Biology 2	C	MAB150X	6	12	0.100	Continuous	Yes
3	1st Sem	MRS260S	Marine Resource Management I	C		6	12	0.100	Continuous	Yes
3	1st Sem	MAP260S	Marine Pollution I	C		6	12	0.100	Continuous	Yes
3	2nd Sem	KOR260S	Computer Skills 2	C	KOR151X	6	12	0.100	Continuous	Yes
3	2nd Sem	CSM260S	Coastal Management 2	C	CSM250S	6	12	0.100	Continuous	Yes
3	2nd Sem	MAL260S	Marine Law I	C		6	12	0.100	Continuous	Yes
3	2nd Sem	MAQ250S	Marine Aquaculture I	C		5	12	0.100	Continuous	Yes
3	2nd Sem	MAT260S	Marine Technology	C		6	12	0.100	Continuous	Yes
4	1st Sem	ECL370S	Ecology 3	C	ECL160X	7	15	0.125	Continuous	Yes
4	1st Sem	MAB370S	Marine Biology 3	C	MAB260S	7	15	0.125	Continuous	Yes
4	1st Sem	BUS360S	Business Principles	C		6	12	0.125	Continuous	Yes
4	1st Sem	MAQ370S	Marine Aquaculture 2	E	MAQ250S	7	15	0.125	Continuous	Yes
4	1st Sem	MAL370S	Marine Law 2	E	MAL260S	7	15	0.125	Continuous	Yes
4	1st Sem	CSM370S	Coastal Management 3	E	CSM260S	7	15	0.125	Continuous	Yes
4	1st Sem	MAS370S	Marine Science 3	E	MAS260S	7	15	0.125	Continuous	Yes
4	2nd Sem	MSI360S	Marine Science Industry Practice 1	C	All theory subjects	6	48	0.400	Project	Yes

## BACCALAUREUS TECHNOLOGIAE: OCEANOGRAPHY

**QUALIFICATION CODE: BTOCNG**

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
4	Year	RMN201S	Research Methodology: Natural Sciences	C		7	15	0.125	Continuous	Yes
4	Year	ECS100S	Economics 1	C		7	15	0.125	Continuous	Yes
4	Year	AMY400S	Applied Marine Biology 4	C		7	45	0.375	Continuous	Yes
4	Year	FIE400S	Fisheries Environment 4	C		7	45	0.375	Continuous	Yes

## MTECH: OCEANOGRAPHY

**QUALIFICATION CODE: MTOCNR**

Period of Study	Year/Sem Subject	Subject Code	Subject Name	Compulsory or Elective	Pre or Co-requisite Subject Codes	NQF Level	SAQA Credits	HEMIS Credit	Assessment Type	Summative Assessment
5	Year	R1M5087	Research Project and Dissertation	C		8	180	1.000	Project	Thesis

## DIPLOMA SUBJECTS: MARINE SCIENCE

Note that the information provided below is only a short summary – please refer to the respective Subject Guides for more detail.

### MARINE SCIENCE I

---

Pre-requisites: None

---

Course outline: Understanding the earth and its environments: An ocean world; history of marine science; the timeline of life on earth; earth structure and plate tectonics; the origin and movement of water on earth between the land, ocean and atmosphere; tidal forces; continental margins and ocean basins; basic concepts of natural hydrologic systems (rivers, lakes, estuaries, ice and groundwater); nutrient cycling; basic seamanship

---

Assessment: All assessments are compulsory.

---

### ECOLOGY I

---

Pre-requisites: None

---

Course outline: Introduction to ecology, components of an ecosystem, energy in the ecosystem, ecological interactions, productivity in the ecosystem, population dynamics

---

Assessment: All assessments are compulsory.

---

### COMMUNICATION SKILLS I

---

Pre-requisites: None

---

Course outline: Communication theory, information gathering, non-verbal communication, aural and oral skills, reading and writing skills

---

Assessment: All assessments are compulsory.

---

### BIOMATHEMATICS

---

Pre-requisites: None

---

Course outline: Mathematical calculations, trigonometry, algebra, graphs, statistical calculations, correlation and regression, probability, calculus

---

Assessment: All assessments are compulsory.

---

### COMPUTER SKILLS I

---

Pre-requisites: None

---

Course outline: Introduction to computers, computer utilisation (word-processing skills, spreadsheet skills, presentation software), data management

---

Assessment: All assessments are compulsory.

---

### MARINE BIOLOGY I

---

Pre-requisites: None

---

Course outline: Basic biochemistry, cell biology, genetics, cellular processes, embryology, introduction to biodiversity and taxonomy, algae and protists

---

Assessment: All assessments are compulsory.

---

## MARINE CHEMISTRY 1

---

Pre-requisites: None

---

Course outline: Chemical reactivity, REDOX reactions, structure of atoms, chemical bond,; inorganic chemistry, gases, equilibrium, thermodynamics, electrochemistry, organic chemistry, functional group chemistry

---

Assessment: All assessments are compulsory.

---

## MARINE PHYSICS I

---

Pre-requisites: None

---

Course outline: Motion and forces, energy, electric fields, magnetic fields, physics and ecology, physics of biofluid mechanics, physics of light and vision

---

Assessment: All assessments are compulsory.

---

## ECOLOGY 2

---

Pre-requisites: Ecology I

---

Course outline: Marine habitats, marine communities and systems, ecological processes in marine environments

---

Assessment: All assessments are compulsory.

---

## PROJECT MANAGEMENT I

---

Pre-requisites: None

---

Course outline: Change context, project management fundamentals, change and configuration management, managing people, initial planning for projects, project monitoring and control

---

Assessment: All assessments are compulsory.

---

## COASTAL MANAGEMENT I

---

Pre-requisites: None

---

Course outline: Introduction to environmental science, environmental variables, climate change

---

Assessment: All assessments are compulsory.

---

## MARINE LAW I

---

Pre-requisites: None

---

Course outline: South African Common Law, principles of law, principles of environmental law, local environmental legislation, principles of criminal law

---

Assessment: All assessments are compulsory.

---

## MARINE AQUACULTURE I

---

Pre-requisites: None

---

Course outline: Introduction to aquaculture, including aquaculture operations, managing aquaculture operations, principles, animal physiology, culture systems

---

Assessment: All assessments are compulsory.

---

## MARINE RESOURCE MANAGEMENT I

Pre-requisites: None

Course outline: Principles of fisheries management, SA fisheries management and regulation of fishing activities, Monitoring, Control and Surveillance

Assessment: All assessments are compulsory.

## MARINE POLLUTION I

Pre-requisites: None

Course outline: Introduction to pollution, Pollutants, Pollution in South Africa, Bioaccumulation, Assessment of toxicity, biochemical mechanisms of toxicity, effects of toxicity, special subjects in toxicity

Assessment: All assessments are compulsory.

## COMPUTER SKILLS 2

Pre-requisites: Computer Skills I

Course outline: Processing, analysis and modelling of data, manipulating data sets, interpretation of data, mapping and other applicable software, MATLAB

Assessment: All assessments are compulsory.

## COASTAL MANAGEMENT 2

Pre-requisites: Coastal management I

Course outline: Environmental issues, principles of environmental impact assessment (EIA), environmental management system (EMS), economic approach to environmental management, risk assessment, environmental auditing, environmental monitoring and performance

Assessment: All assessments are compulsory.

## MARINE BIOLOGY 2

Pre-requisites: Marine Biology I

Course outline: Marine invertebrate biology, phytoplankton and zooplankton

Assessment: All assessments are compulsory.

## MARINE SCIENCE 2

Pre-requisites: Marine Science I

Course outline: Ocean currents, physical oceanography, ocean data

Assessment: All assessments are compulsory.

## MARINE TECHNOLOGY

Pre-requisites: None

Course outline: Ocean data, oceanographic equipment, hydrographic mapping, ADCP' fishing equipment technology, ocean measurements

Assessment: All assessments are compulsory.

## **ECOLOGY 3**

Pre-requisites: Ecology 2

Course outline: Marine communities, population dynamics of marine communities

Assessment: All assessments are compulsory.

## **MARINE BIOLOGY 3**

Pre-requisites: Marine Biology 2

Course outline: Vertebrate biology, marine ecophysiology

Assessment: All assessments are compulsory.

## **BUSINESS PRINCIPLES**

Pre-requisites: None

Course outline: Small business: business administration, enterprise planning and entrepreneurship, start-up, small business operations and problems, personnel supervision, capitalisation and investment, taxation, business law and regulations, e-commerce, home business operations, and applications to marine sectors, products and services.

Assessment: All assessments are compulsory.

## **MARINE AQUACULTURE 2**

Pre-requisites: Marine Aquaculture 1

Course outline: Applied marine aquaculture systems, feeding, brood stock, parasitology, System design, setup, maintenance & improvement

Assessment: All assessments are compulsory.

## **MARINE LAW 2**

Pre-requisites: Marine Law 1

Course outline: International law, law of climate change, UNCLOS, fisheries management, NEMA, applicable marine/maritime acts

Assessment: All assessments are compulsory.

## **COASTAL MANAGEMENT 3**

Pre-requisites: Coastal management 2

Course outline: Applied environmental impact assessment (EIA)

Assessment: All assessments are compulsory.

## **MARINE SCIENCE 3**

Pre-requisites: Marine Science 2

Course outline: Remote sensing, application of oceanographic instrumentation, ocean & marine data processing & data processing technology, software & applications thereof

---

Assessment: All assessments are compulsory.

---

## **MARINE SCIENCE INDUSTRY PRACTICE I**

---

Pre-requisites: successful completion of all academic subjects until the end of the fifth semester; subject to approval from the programme co-ordinator

---

Students are expected to work for one semester in an appropriate workplace, i.e. marine protected area, marine company, research institution or laboratory. The techniques utilised at the workplace must be from any one of the following fields: marine aquaculture, marine conservation, marine environmental consultancies, oceanography or marine companies.

---

Assessment: Projects and interview evaluation

---