



Western Cape  
Government

# PROSPECTUS

## Bachelor of Agriculture

# ELSENBURG AGRICULTURAL TRAINING INSTITUTE



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### Applications

Applications on the prescribed application form must reach the Institute by or on 30 June of the preceding year of study. Applications are done online and can be accessed on the Eisenburg website. All applicants must, if required, complete the standardised tests of the Stellenbosch University.

### Student number

On receipt of new applications the Institute office assigns a unique number to each applicant that serves as identification of the individual concerned so as to simplify future communication. This unique number must be used in all future correspondence with the Institute.

**PLEASE NOTE:**

1. The Elsenburg Agricultural Training Institute (EATI) reserves the right to amend the Prospectus at any time.
2. Management of the EATI accepts no liability for any inaccuracies there may be in the Prospectus. Every reasonable care has, however, been taken to ensure that the relevant information to hand as of January 2025, the time of going to press, is given fully and accurately in the Prospectus.

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## **VISION**

The Advancement of Elsenburg Agricultural Training Institute as an agricultural and educational centre of excellence to the benefit of the broader community.

## **MISSION**

To promote sound, integrated managerial and skills training in agriculture with advanced specialisation in area specific fields of excellence informed by industry and societal needs.

## **ELSENBURG: A PROUD TRADITION**

Elsenburg's history dates back to 1698, when the land was allocated to Samuel Elsevier by Willem Adriaan van der Stel, at that time the governor of the Cape colony. The farm's successive owners, among whom Martin Melck is probably the best known, built it up to one of the prime farms in the Cape. Martin Melck built the beautiful old manor house in 1761. The farm was sold to the government by the Myburgh family in 1898.

On 1 September 1898 the Agricultural College, the first of its kind in South Africa, opened its doors. Five students received their diplomas at the end of the first academic year (June 1899). During the first fourteen years of its existence the average number of students was 44. During the First World War, however, there was a drastic reduction in applications, with only 8 students studying there in 1915.

In 1926 Elsenburg College of Agriculture and the University of Stellenbosch amalgamated and a two-year diploma course was offered at Elsenburg, with the primary aim of training prospective farmers. In 1927 this course was replaced with a one-year course, which was replaced by practical courses in 1931. In 1939 the two-year diploma course was reinstated. Elsenburg's relationship of 47 years with the University was severed in 1973 and the Department of Agriculture accepted responsibility for agricultural training at Elsenburg.

An important milestone in 1976 was the establishment of the Diploma in Cellar Technology. Many of South Africa's winemakers today, received their agricultural training at Elsenburg.

In 1994, with the transformation to a democratic political order in South Africa, the Department of Agriculture: Western Cape was created. The Elsenburg and Kromme Rhee colleges of agriculture amalgamated. The amalgamation placed a great responsibility on the Department of Agriculture to continue and to expand the training offered. A Centre for Further Education and Training was consequently created to address the need for short, practical courses.

The relationship with the University of Stellenbosch was again initiated and since 2004 Elsenburg has been offering a B.Agric programme in association with the University of Stellenbosch's Agriscience Faculty.

This development is in line with the government's new academic policy to give tertiary students more mobility between educational institutions. Duplication of programmes is also eliminated. Elsenburg College of Agriculture was renamed on 1 April 2004 to the Elsenburg Agricultural Training Institute.

# PROGRAMME FOR B.AGRIC.

## FIRST-YEAR

PLANT PRODUCTION	ANIMAL PRODUCTION	PLANT & ANIMAL PRODUCTION	CELLAR TECHNOLOGY	EXTENSION & PLANT PRODUCTION	EXTENSION & ANIMAL PRODUCTION
<b>(ABM)</b> Agribusiness112, 142 <b>(BIO)</b> Cell biology 113, <b>(BIO)</b> Biological processes143 <b>(PAS)</b> Chemistry 111, <b>(PAS)</b> Mathematics 121 <b>(PAS)</b> Laboratory tech 141 <b>(BSS)</b> Soil Science 112, 142 <b>(CPP)</b> Crop Protection 141 <b>(ENG)</b> Agric Engineering 142 <b>(COM)</b> Communication 111 <b>(NRM)</b> Ecosystems 142 <b>(CPU)</b> Computer Lit.112	<b>(ABM)</b> Agribusiness112, 142 <b>(BIO)</b> Cell biology 113, <b>(BIO)</b> Biological processes 143 <b>(PAS)</b> Chemistry 111, <b>(PAS)</b> Mathematics 121 <b>(PAS)</b> Laboratory tech 141 <b>(BSS)</b> Soil Science 112, 142 <b>(CPP)</b> Crop Protection 141 <b>(ENG)</b> Agric Engineering 142 <b>(COM)</b> Communication 111 <b>(NRM)</b> Ecosystems 142 <b>(CPU)</b> Computer Lit.112	<b>(ABM)</b> Agribusiness112, 142 <b>(BIO)</b> Cell biology 113, <b>(BIO)</b> Biological processes 143 <b>(PAS)</b> Chemistry 111, <b>(PAS)</b> Mathematics 121 <b>(PAS)</b> Laboratory tech 141 <b>(BSS)</b> Soil Science 112, 142 <b>(CPP)</b> Crop Protection 141 <b>(ENG)</b> Agric Engineering 142 <b>(COM)</b> Communication 111 <b>(NRM)</b> Ecosystems 142 <b>(CPU)</b> Computer Lit.112	<b>(ABM)</b> Agribusiness112, 142 <b>(BIO)</b> Cell biology 113, <b>(BIO)</b> Biological processes 143 <b>(PAS)</b> Chemistry 111, <b>(PAS)</b> Mathematics 121 <b>(PAS)</b> Laboratory tech 141 <b>(BSS)</b> Soil Science 112, 142 <b>(CPP)</b> Crop Protection 141 <b>(ENG)</b> Agric Engineering 142 <b>(COM)</b> Communication 111 <b>(NRM)</b> Ecosystems 142 <b>(CPU)</b> Computer Lit.112	<b>(ABM)</b> Agribusiness112, 142 <b>(BIO)</b> Cell biology 113, <b>(BIO)</b> Biological processes 143 <b>(PAS)</b> Chemistry 111, <b>(PAS)</b> Mathematics 121 <b>(PAS)</b> Laboratory tech 141 <b>(BSS)</b> Soil Science 112, 142 <b>(CPP)</b> Crop Protection 141 <b>(ENG)</b> Agric Engineering 142 <b>(COM)</b> Communication 111 <b>(NRM)</b> Ecosystems 142 <b>(CPU)</b> Computer Lit.112	<b>(ABM)</b> Agribusiness112, 142 <b>(BIO)</b> Cell biology 113, <b>(BIO)</b> Biological processes 143 <b>(PAS)</b> Chemistry 111, <b>(PAS)</b> Mathematics 121 <b>(PAS)</b> Laboratory tech 141 <b>(BSS)</b> Soil Science 112, 142 <b>(CPP)</b> Crop Protection 141 <b>(ENG)</b> Agric Engineering 142 <b>(COM)</b> Communication 111 <b>(NRM)</b> Ecosystems 142 <b>(CPU)</b> Computer Lit.112
k = 130	k = 130	k = 130	k = 130	k = 130	k = 130

## SECOND YEAR

PLANT PRODUCTION	ANIMAL PRODUCTION	PLANT & ANIMAL PRODUCTION	CELLAR TECHNOLOGY	EXTENSION & PLANT PRODUCTION	EXTENSION & ANIMAL PRODUCTION
<p>(ABM) Agribusiness 212, 242 (ENT) Entrepreneurship 221 (BSS) Soil Science 212 (CPP) Crop Protection 242 (ENG) Irrigation 213, (ENG) Spraying machines 243 (COM) Persuasive comm. 211 (NRM) Resource utilisation 242</p> <p>and choose <b>TWO</b> from the following groups</p> <p><b>GROUP 1 (Agronomy)</b> (AGR) Grain cult. 212, (AGR) Small grains 242</p> <p><b>GROUP 2 (Vegetables)</b> (AGR) Seedling production 222, (AGR) Greenhouse 252</p> <p><b>GROUP 3 (Horticulture)</b> (HRT) Fruit production 212, (HRT) Orchard est. 242</p> <p><b>GROUP 4 (Viticulture)</b> (VIT) Propagation 212, (VIT) Establish &amp; Develop. 242</p>	<p>(ABM) Agribusiness 212, 242 (ENT) Entrepreneurship 221 (BSS) Soil Science 212 (CPP) Crop Protection 242 (ENG) Irrigation 213, (ENG) Spraying machines 243 (COM) Persuasive comm. 211 (NRM) Resource utilisation 242 (ANH) Animal Health 222 (ANP) Animal nutrition 212, (ANP) Large stock 242, (ANP) Small stock 262</p>	<p>(ABM) Agribusiness 212, 242 (ENT) Entrepreneurship 221 (BSS) Soil Science 212 (CPP) Crop Protection 242 (ENG) Irrigation 213, (ENG) Spraying machines 243 (COM) Persuasive comm.211 (NRM) Resource utilisation 242 (ANH) Animal Health 222 (AGR) Grain cult. 212, (AGR) Small grains 242</p> <p>and choose <b>ONE</b> from the following groups</p> <p><b>GROUP 1 (Large stock)</b> (ANP) Animal nutrition 212, (ANP) Large stock 242,</p> <p><b>GROEP 2 (Small stock)</b> (ANP) Animal nutrition 212, (ANP) Small stock 262</p>	<p>(ABM) Agribusiness 212, 242 (ENT) Entrepreneurship 221 (BSS) Soil Science 212 (CPP) Crop Protection 242 (ENG) Irrigation 213, (ENG) Spraying machines 243 (COM) Persuasive comm.211 (NRM) Resource utilisation 242 (VIT) Propagation 212, (VIT) Establish &amp; Develop. 242 (OEN) Chem &amp; Microbio. 212, (OEN) Wine prep. 242</p>	<p>(ABM) Agribusiness 212, 242 (ENT) Entrepreneurship 221 (BSS) Soil Science 212 (CPP) Crop Protection 242 (ENG) Irrigation 213, (ENG) Spraying machines 243 (COM) Persuasive comm. 211 (NRM) Resource utilisation 242 (EXT) Sustainable Livelihoods 212, (EXT) Behavioural change 242</p> <p>and choose <b>ONE</b> from the following groups</p> <p><b>GROUP 1 (Vegetables)</b> (AGR) Seedling production 222, (AGR) Greenhouse 252</p> <p><b>GROUP 2 (Horticulture)</b> (HRT) Fruit production 212, (HRT) Orchard est. 242</p> <p><b>GROUP 3 (Viticulture)</b> (VIT) Propagation 212, (VIT) Establish &amp; Develop. 242</p>	<p>(ABM) Agribusiness 212, 242 (ENT) Entrepreneurship 221 (BSS) Soil Science 212 (CPP) Crop Protection 242 (ENG) Irrigation 213, (ENG) Spraying machines 243 (COM) Persuasive comm. 211 (NRM) Resource utilisation 242 (ANH) Animal Health 222 (EXT) Sustainable livelihoods 212, (EXT) Behavioural change 242</p> <p>and choose <b>ONE</b> from the following groups</p> <p><b>GROUP 1 (Large stock)</b> (ANP) Animal nutrition 212, (ANP) Large stock 242,</p> <p><b>GROEP 2 (Small stock)</b> (ANP) Animal nutrition 212, (ANP) Small stock 262</p>
k = 130	k = 130	k = 140	k = 130	k = 130	k = 140



## THIRD YEAR

PLANT PRODUCTION	ANIMAL PRODUCTION	PLANT & ANIMAL PRODUCTION	CELLAR TECHNOLOGY	EXTENSION & PLANT PRODUCTION	EXTENSION & ANIMAL PRODUCTION
<p>(ABM) Labour relations 313 (ABM) Marketing 343 (NRM) Conservation 311, (NRM) Legislation 341 (ENG) Irrigation sched. 311, (ENG) Tractor mech. 341</p> <p>and <b>TWO</b> of the following groups</p> <p><b>GROUP 1 (Agronomy)</b> (AGR) Small grain cult. 313 (AGR) Harvesting &amp; grading 343 (AGR) Pasture management 321, (AGR) Cult. pastures 351 (HRT) Alternative crops 361</p> <p><b>GROUP 2 (Vegetables)</b> (AGR) Cabbage, lettuce &amp; swt.com 332, (AGR) Curcurbits, gr.beans &amp; carrots 322, (AGR) Potatoes &amp; onions 342 (HRT) Value adding 332 (HRT) Cut flowers 331</p> <p><b>GROUP 3 (Horticulture)</b> (HRT) Cultivars &amp; post-harvest 312, (HRT) Production practices 322, (HRT) Pest &amp; Diseases 342, (HRT) Citrus cult. 352</p> <p>and <b>ONLY ONE</b> of (HRT) Alternative fruit 351 or (HRT) Value adding 332 or (HRT) Cut flowers 331 or (HRT) Alternative crops 361</p> <p><b>GROUP 4 (Viticulture)</b> (VIT) Cultivars &amp; Foliage 313, (VIT) Fertilisation &amp; Weeds 321, (VIT) Irr., pest, disease, IPW 344, (VIT) Table &amp; Raisin grape 352</p>	<p>(ABM) Labour relations 313 (ABM) Marketing 343 (NRM) Conservation 311, (NRM) Legislation 341 (AGR) Pasture management 321, (AGR) Cult. pastures 351</p> <p>and <b>BOTH</b> of the following groups</p> <p><b>GROUP 1 (Large stock)</b> (ANP) Dairy cattle 312, (ANP) Beef cattle 342, (ANP) Dairy Science 352 (ANH) Large stock health 322</p> <p><b>GROUP 2 (Small stock)</b> (ANP) Sheep Manage. 332, (ANP) Wool Science 362, (ANP) Meat science 353 (ANH) Small stock health 332</p> <p>and <b>ONLY ONE</b> of (ANP) Pork prod. 321, (ANP) Poultry prod. 351, (ANP) Aquaculture 361</p>	<p>(ABM) Labour relations 313 (ABM) Marketing 343 (NRM) Conservation 311, (NRM) Legislation 341 (AGR) Small grain cult. 313 (AGR) Harvesting &amp; grading 343 (AGR) Pasture management 321, (AGR) Cult. pastures 351 (ENG) Tractor mech. 341</p> <p>and <b>ONE</b> of the following groups</p> <p><b>GROUP 1 (Large stock)</b> (ANP) Dairy cattle 312, (ANP) Beef cattle 342, (ANH) Large stock health 322 AND (ANP) Dairy Science 352, (ANP) Meat science 353 OR <b>ONE</b> of the following (ANP) Dairy Science 352 (ANP) Meat science 353</p> <p>and <b>ONE</b> of the following (ANP) Pork prod. 321, (ANP) poultry prod. 351, (ANP) Aquaculture 361</p> <p><b>GROUP 2 (Small stock)</b> (ANP) Sheep Manage. 332, (ANP) Wool Science 362, (ANP) Meat science 353 (ANH) Small stock health 332 and <b>ONE</b> of the following (ANP) Pork prod. 321, (ANP) Poultry prod. 351, (ANP) Aquaculture 361</p>	<p>(ABM) Labour relations 313 (ABM) Marketing 343 (NRM) Conservation 311, (NRM) Legislation 341 (ENG) Irrigation sched. 311, (ENNG) 321, 351 (VIT) Cultivars &amp; Foliage 313, (VIT) Fertilisation &amp; Weeds 321, (VIT) Irr., pest, disease, IPW 344,</p> <p>and <b>ONE</b> of the following groups</p> <p><b>GROUP 1 (Cellar technology)</b> (OEN) Microbiology &amp; anal. 311, (OEN) Harvesting &amp; quality 313, (OEN) Chemistry &amp; anal. 321, (OEN) Stabilisation &amp; qual. 342, (OEN) Wine chemistry 351, (OEN) Wine microbiology 361 OR <b>GROUP 2 (Cellar Management)</b> (CMT) Operational manage 314, (CMT) Quality assurance 341, (CMT) Human manage 343</p>	<p>(ABM) Labour relations 313 (ABM) Marketing 343 (NRM) Conservation 311, (NRM) Legislation 341 (ENG) Irrigation sched. 311, (ENG) Tractor mech. 341 (EXT) Groups &amp; leadership 312, (EXT) Extension management 322, (EXT) Programme planning 344</p> <p>and <b>ONE</b> of the following groups</p> <p><b>GROUP 1 (Vegetables)</b> (AGR) Cabbage, lettuce &amp; swt.com 332, (AGR) Curcurbits, gr.beans &amp; carrots 322, (AGR) Potatoes &amp; onions 342 (HRT) Value adding 332 (HRT) Cut flowers 331</p> <p><b>GROUP 2 (Horticulture)</b> (HRT) Cultivars &amp; post-harvest 312, (HRT) Production practices 322, (HRT) Pest &amp; Diseases 342, (HRT) Citrus cult. 352</p> <p>and <b>ONLY ONE</b> of (HRT) Alternative fruit 351 or (HRT) Value adding 332 or (HRT) Cut flowers 331 or (HRT) Alternative crops 361</p> <p><b>GROUP 3 (Viticulture)</b> (VIT) Cultivars &amp; Foliage 313, (VIT) Fertilisation &amp; Weeds 321, (VIT) Irr., pest, disease, IPW 344, (VIT) Table &amp; Raisin grape 352</p>	<p>(ABM) Labour relations 313 (ABM) Marketing 343 (NRM) Conservation 311, (NRM) Legislation 341 (AGR) Pasture management 321, (AGR) Cult. pastures 351 (EXT) Groups &amp; leadership 312, (EXT) Extension management 322, (EXT) Programme planning 344</p> <p>and <b>ONE</b> of the following groups</p> <p><b>GROUP 1 (Large stock)</b> (ANP) Dairy cattle 312, (ANP) Beef cattle 342, (ANP) Dairy Science 352 (ANH) Large stock health 322</p> <p><b>GROUP 2 (Small stock)</b> (ANP) Sheep Manage. 332, (ANP) Wool Science 362, (ANP) Meat science 353 (ANH) Small stock health 332</p> <p>and <b>ONLY ONE</b> of (ANP) Pork prod. 321, (ANP) poultry prod. 351, (ANP) Aquaculture 361</p>
k = 125-145	k = 135	k = 125-130	k = 140	k = 130-140	k = 130-135

# CONTENT OF MODULES

## AGRIBUSINESS MANAGEMENT (ABM)

### **112 (10) Introduction to local and international agriculture (4l + 3p)**

Introduction to agriculture – worldwide expectations from agriculture and how well these expectations are met. Trends, the main products produced in South Africa (S.A), current status and future prospects and where does S.A feature in the world. An introduction to South African agriculture. The effect of a decreasing/increasing contribution to the GDP. An introduction to AgriBEE and land reform and other initiatives such as LRAD, CASP, ASGISA, etc. The meaning and process of farming decision-making, farming management responsibilities and an introduction to enterprise structures.

### **142 (10) Agri-economic concepts and planning principles of an agribusiness (4l + 3p)**

Some agro-economic concepts such as output and input terms. Production-economic planning principles for agribusinesses. Cost principles with specific reference to cost concepts and the application of it. The compilation of a management information system and a farm-record system for agribusinesses. Analysis of management information, financial analysis, diagnostic analysis and financial sustainability analysis.

Practical: Compiling a computerised financial management information system for a given agribusiness; case studies to illustrate the production economic planning principles and the various financial statements.

### **212 (10) Planning principles for agribusinesses (4l + 3p)**

Risk management and planning in agribusiness: Types of risks, such as business risks and financial risks. Risk management techniques with regard to financial risks, diversification, flexibility, marketing strategy and the management of a cash or credit reserve. Risk calculation: a choice between alternatives under conditions of insufficient information. Planning techniques for agribusiness managers – Farming planning: budgets. Mechanisation management in the agribusiness: Nature and estimation of the cost of machinery, the purchase and replacement of machinery.

Practical: Calculations with regard to risk management, enterprise budgets and other relevant budgets will be dealt with practically. The costs involved in mechanisation will be illustrated by means of practical examples.

**P Agribusiness Management 142**

### **242 (10) Project planning and financing (4l + 3p)**

Project planning and investment decisions in agribusiness. Evaluation of investment alternatives, budgets and various investment instruments/approaches. Agribusiness financing and financing sources: Description of financing policy, capital needs, maintaining liquidity and reabsorption ability and beneficial financing. Introduction to obtaining credit, credit assessment, repayment ability, security, risk and rules when obtaining credit and providing credit. Finance and credit analysis plan, the cost of capital and financing sources. Tax aspects relevant to agribusinesses.

Practical: Project planning, investment decisions and financing. Analysis of management information and tax aspects.

**P Agribusiness Management 142**

### **313 (15) Labour relations and -legislation (6l + 2p)**

Synthesis of labour legislation, the essential elements and what it entails. Labour management: Administration and motivation. Trade unions: Strikes and lockouts, disciplinary actions, grievance procedures, dismissal and discharge.

Practical: The aspects involved in staff maintenance, recruitment and the disciplinary processes.

### **343 (15) Marketing management (6l + 2t)**

Basic principles of marketing management and the marketing-mix. Consumer behaviour, marketing information and research, market segmentation, elements of a marketing plan, international trade and marketing alternatives. Micro and macro environment: Analysis of South African agriculture: interaction between the two environments in the agricultural value chain.

Tutorial: The development of a marketing plan for an agribusiness.

## **AGRICULTURAL ENGINEERING (ENG)**

### **142 (10) Building Science and workshop practice (4l + 3p)**

Basic building science (base courses, walls, floors, doors and windows, roof coverings, finish, sewerage, drawing up a list of materials).

Practical: Practising of basic techniques of welding (arc welding and gas welding). Interpretation of plans, uses of topographical maps, drawing of contour maps.

**P Principles of Agricultural Science 121**

### **213 (15) Irrigation and drainage (6l)**

Types of irrigation systems, definitions and units, soil characteristics, crops and climate, earth dams and water quality, pumps, irrigation fittings, sprinkler irrigation and maintenance. Drainage, types of systems, types of material, layout, installation and maintenance.

Practical: Demonstrative (visit irrigation firms to look at the manufacturing and distribution of irrigation equipment).

**P Principles of Agricultural Science 121**

### **243 (15) Spraying machines, calibration techniques and electricity (6l)**

Types of spraying machines, operation and use of spraying machines, advantages and disadvantages of types of atomising mechanisms, fans, pumps and hydraulic systems, calibration techniques and examples. General concepts of electricity (generation, distribution, tariffs, cable sizes, voltage, resistance and current, safe user-practices of electric motors, driving systems, motor sizes and maintenance).

Practical: Adjusting (calibration) of different types of spraying machines for vineyard and orchard spraying.

**P Principles of Agricultural Science 121**

### **311 (5) Scheduling of irrigation (plant production) (2l)**

Micro-irrigation; moving systems; flood irrigation; scheduling of irrigation, scheduling aids, chemigation.

Practical: Scheduling of vineyard and orchard irrigation with capacitance measuring, tension meters and A pan.

**C Horticulture 212 or Viticulture 212 or Agronomy 222**

### **321 (5) Cellar mechanics and Cellar engineering (2l + 2p)**

The operation, use and maintenance of equipment required during the winemaking process: separators, presses, filters, pipes, pumps, tanks and bottling apparatus. Cooling and cooling systems; electricity: including terminology, the operation of motors, generators, transformers, switch boards, forklifts and packaging apparatus; essential workshop equipment; basic fault-detection and preventative maintenance; waste water systems; residual product handling.

Practical: Practical demonstration of machinery and problem solving, industry visits, group discussions.

**P Oenology 212, 242**

### **341 (5) Tractor mechanics (Plant production) (2l)**

Operation of diesel engines, driving systems, load of tractors, draught force and choice of tractor, maintenance of tractors.

Practical: Demonstration of tractor models at firms or by firms.

**P Horticulture 212 or Viticulture 212 or Agronomy 212 or Agronomy 222**

### **351 (5) Cellar planning and layout of site (2l)**

Planning and layout of a cellar according to specific needs: latest equipment and designs, relevant legal and administrative determinations, site planning with due consideration for the aesthetic and practical needs, the location of the cellar with regard to vineyards, access routes, availability and extent of needs from resources (water, electricity), marketing strategies and financing. Practical: Industry visits, Planning assignment

**P Oenology 212, 242**

## **AGRONOMY (AGR)**

### **212 (10) Introduction to the cultivation of cool weather crops in South Africa**

#### **(4l + 3p)**

Introductory overview of the grain industry in South Africa and more specifically the small-grain industry in the Western Cape; relationships between soil, climate, environment and production capacity; problem areas, marketing and market tendencies in the grain industry.

Practical: Self-study with regard to marketing options and class presentation of results.

**P Biology 113, 143; Soil Science 112, 142**

### **222 (10) Introduction to the vegetable industry in South Africa and seedling production (4l + 3p)**

Synoptic module with emphasis on the origin and development of the vegetable industry in South Africa, the classification and production areas of vegetables as well as its economic impact. The influence of the different environmental factors, general soil preparation and choice of implements, broad fertilisation principles, irrigation methods, as well as pest control principles on the vegetable industry. Seed, germination and general care of seedlings. Growth and general care of cuttings.

Practical: Independent research with regard to marketing and market tendencies as seminar and research project. Seedling production and collecting of data in terms of tunnel production. Collected information to be handed in. General growth and care of cuttings.

**P Biology 113, 143; Soil Science 112, 142**

### **242 (10) Morphology, development, adaptation and physiological aspects of cool weather crop yields (4l + 3p)**

Growth and development, adaptation and physiological aspects of cool-weather crop yields.

Practical: Growth point analyses and development stage determination, growth stage determination, morphological differences between various types of cool weather crops, description of different agronomic production areas of the Western Cape with regard to grain production.

**C Agronomy 212**

**P Biology 113, 143; Soil Science 112, 142**

### **252 (10) Greenhouse Management and the cultivation of crops under protection (4l + 3p)**

Biology and technology of vegetable cultivation under a controlled environment. Origin and economic importance and uses of controlled environment cultivation. Production of vegetable seedlings in controlled environments, as well as the economically justifiable cultivation of vegetables in tunnels. Selection of different types of tunnels, their location, sanitation, fertilization programmes, integrated pest and disease control. Practical: Responsible for seedling production and the care of vegetable plants in different tunnels.

**P Biology 113, 143; Soil Science 112, 142**

### **313 (15) Applied small-grain cultivation and crop rotation (6l + 2p)**

Farm planning, crop rotation principles and crop planning, soil preparation and fertilisation, cultivation techniques for sustainable utilisation, planning of sowing-season.

Practical: Farm planning with the aid of orthographic photos and soil classification maps, crop rotation planning based on soil types, calculation of fertilisation recommendations on the basis of soil analysis results, calibration of sowing and fertilisation equipment, farm visits, visits to farm implement manufacturers and/or marketers, demonstration and discussion of minimum tillage planters.

**P Agronomy 212, 242; Soil Science 212**

### **321 (5) Principles of veldt management (2l + 3p)**

Plant succession, growth processes in plants, production systems for utilisation of pastures, pasture quality, influence of defoliation on plants, grazing animals, selective grazing, division of farm into homogenous camps, principles of veldt rest, factors influencing the value of a farm in extensive grazing regions, drought-resistant forage crops and radical field improvement.

Practical: Three-day study visit to a Karoo farm, Karoo plant identification, applied grazing management principles on the basis of real examples and demonstration of farm planning principles.

### **322 (10) Cultivation of Curcubit crops, carrot and green beans (4l + 2p)**

Introduction and origin of crops, nutritional value, economic importance in the industry, climatic and soil requirements for successful cultivation, establishment and care of crops with respect to fertilisation, irrigation, pest control, harvesting, marketing and storage.

Practical: Conventional cultivation of crops.

**P Soil Science 212 ; Crop Protection 242; Agronomy 222**

### **332 (10) Cultivation of cabbage, lettuce and sweetcorn (4l + 2p)**

Introduction and origin of the crops, nutritional value, economic importance in the industry, climatic and soil requirements for successful cultivation, establishment and care of the crop in respect of fertilisation, irrigation, pest control, harvesting, marketing and storage.

Practical: Conventional cultivation of Cole crops and lettuce.

**P Agronomy 222; Soil Science 212; Crop Protection 242**

### **342 (10) Cultivation of potatoes and onions (4l + 2p)**

Introduction and origin of crops, nutritional value, economic importance in the industry, climatic and soil requirements for successful cultivation, establishment and care of the crop in respect of fertilisation, irrigation, pest control, harvesting, marketing and storage.

Practical: Comparative cultivation of different cultivars of crops.

**P Agronomy 222; Soil Science 212; Crop Protection 242**

### **343 (15) Crop protection practices, harvesting and quality aspects of cool weather crops (6l + 2p)**

Crop and harvest protection practices, harvesting practices and harvesting machinery, uses, storage, grading principles and grading standards of different small grains, oilseed and legume crops.

Practical: Demonstrative lectures by experts with regard to weed , disease and insect control, weed collection assignment, identification test of weeds, demonstration of grading techniques, farm visits, visits to mechanisation farmers' days and experimental farms.

**P Agronomy 313; Crop Protection 242**

### **351 (5) Management of cultivated pastures (2l + 2p)**

Planning before establishment, fertilisation, seed treatments, establishment practices, choice of pasture, management of pastures, quality and nutritional value, fodder storage, plant protection.

Practical: Seed and plant identification of different types of pastures, farm visits and fodder storage demonstration, lectures by experts in respect of pasture management and choice of cultivars.

**P Soil Science 212; Crop Protection 242**



## **ANIMAL HEALTH (ANH)**

### **222 (10) General animal health principles (4l + 3p)**

Introduction to the anatomy and basic principles of animal physiology of ruminants and non-ruminant livestock. The locomotor nervous, blood and lymphatic, heart and circulatory, respiratory, digestive, urinary, endocrine and reproductive systems. Handling of animals; classification of causes of diseases; immunity and vaccinations; prevention of diseases on a flock/ herd basis; biosecurity; veterinary hygiene; meat hygiene; milk-shed hygiene; clinical examination of animals; first aid on farms; treatment techniques; elementary farm operations and the value of autopsies.

Practical: Handling of animals; clinical examination of animals; treatment techniques; first aid for the sick animal; taking of samples from the living animal and demonstration of post-mortem examination technique and sample taking.

**P Biology 113, 143**

### **322 (10) Large stock animal health (4l + 2p)**

Metabolic diseases of dairy and beef cattle; the causes, treatment and particularly its prevention, as well as digestive disturbances as a result of feeding, physical problems or diseases; deficiency diseases and imbalances with reference to minerals and vitamins; toxicology of general toxic substances and plant poisoning; external parasites such as insects, ticks and mites; internal parasites such as worms and protozoa; cattle diseases caused by bacteria, viruses, rickettsiosis, chlamydia and fungi; calf diseases that affect the digestive system and respiratory system; reproductive disturbances and perinatal losses in the cow and the bull; state-controlled diseases: the duty of the State and the duty of the farmer in specific cases.

Practical: Artificial insemination in respect of theory, practical demonstrations and training on insemination methods, evaluation to register as an inseminator, and registration (linked to large-stock animal production); dosing and injections with regard to methods and routes for the administering of different remedies.

**P General Animal Health 222**

### **332 (10) Small-stock animal health (4l + 2p)**

Metabolic diseases of sheep and goats; the causes, treatment and particularly its prevention, as well as digestive disturbances as a result of feeding, physical problems or diseases; deficiency diseases and imbalances with regard to minerals and vitamins; toxicology of general toxic substances and plant poisoning; external parasites such as insects, ticks and mites; internal parasites such as worms and protozoa; sheep diseases caused by bacteria, viruses, rickettsiosis, chlamydia and fungi; lamb diseases that affect the digestive system and respiratory system; reproductive disturbances and perinatal losses in the ewe and the ram; state-controlled diseases: the duty of the State and the duty of the farmer in specific cases.

Practical: Dosing and injections given with regard to methods and routes for the administering of various remedies for vaccination or treatment purposes linked to small-stock animal production.

**P Animal Health 222**

## **ANIMAL PRODUCTION (ANP)**

### **212 (10) Principles of animal feeding (4l + 3p)**

Chemical composition of feeds, digestion of feeds, energy and protein standards of feeds, nutritional value of important feeds, practical feeding of different farm animals, formulation of rations.

**P Biology 113, 143**

### **242 (10) Large stock breeding: Management principles (4l + 3p)**

The most important dairy and beef cattle breeds in South Africa, qualitative and quantitative inheritance, responses to selection, methods of selection, selection systems with dairy and beef cattle.

Practical: Assessment of two dairy breeds; visit to beef cattle farm.

**P Biology 113,143**

### **262 (10) Small stock breeding: Management principles (4l + 3p)**

The most important small-stock breeds in South Africa, namely, Merino, Dorper, SA Mutton Merino, Dohne Merino, Dormer, Boer goat and Angora goat. The breed characteristics and breeding standards of animals, basic breeding principles, selection systems, performance testing and "BLUP". Practical: The judging of breeds handled in theory according to their individual breed standards. Attending of judging courses presented by breeding societies.

**P Biology 113,143**

### **312 (10) Dairy cattle production management (4l + 2p)**

Principles with regard to the caring and feeding of calves, feeding and management of replacement heifers, principles with regard to the management of dry cows, feeding and management of the lactating cow, feeding standards of dairy cows, formulation of rations, feeding and care of the bull, management of a dairy herd for maximum profitability.

Practical: Feeding systems, milk systems, machine milking, condition score for dairy cattle, artificial insemination, care of hoofs.

**P Animal Production 212, 242**

### **321 (5) Pork production systems (2l + 2p)**

Planning a piggery, pig housing, care of the pig in its different life stages, pig feeding, breeding and selection of pigs, pig diseases.

**P Animal Production 212**

### **332 (10) Sheep management (4l + 2p)**

The latest management guidelines in sheep farming with regard to different breeding seasons as well as lambing seasons. Different lambing systems. Artificial insemination and controlled breeding. Factors that influence lamb mortality. The feeding needs of ewes and rams at different ages and during different stages of production and reproduction. Practical: Practical handling of sheep on Elsenburg. Visits to sheep farms in the Western Cape to look at different management systems in practice.

**P Animal Production 212, 262**

### **342 (10) Beef cattle production management (4l + 2p)**

The adaptation of beef breeds in a specific environment, feeding of beef cattle during different stages in life, management of a beef herd, production systems, marketing of beef cattle.

Practical: Rearing of calves (dehorning, castration, removal of superfluous teats, feeding and weaning practices); vaccination, dosing and weighing of cattle; identification systems (branding mark, freeze branding, ear tags); handling of cattle.

**P Animal Production 212, 242**

### **351 (5) Poultry production (2l + 2p)**

Poultry industry in South Africa, behaviour and biology of poultry, poultry housing, production of broilers, egg production, hatching of eggs and rearing of young hens, disease control.

Practical: Visit to broiler unit in production and a poultry abattoir.

**P Animal Health 222; Animal Production 212; Entrepreneurship 221**

### **352 (10) Dairy Science (4l + 2p)**

Anatomy and physiology of the udder and the milk procedure, the composition of milk, factors that influence the composition of milk, the milk machine, milk hygiene, undesirable flavours in milk and dairy products.

Practical: Handling of and fault detection in the milk machine, mastitis testing and preventative measures to avoid mastitis, the cheese-making process.

**P Animal Production 212, 242**

### **353 (10) Meat Science (4l + 2p)**

Growth, development and tissue composition and distribution in small stock. Meat quality and meat processing. The treatment of slaughter animals before slaughtering. The classification of carcasses and by-products at the abattoir. Practical: Visits to commercial abattoirs and meat processing plants to see how the different animals are slaughtered and how the meat of different animals is processed. Learning which cuts are used for which products.

**P Animal Production 242 or Animal Production 262**

### **361 (5) Aquaculture production systems (2l + 2p)**

Water quality and environment, choice of premises, species and their biology, development of production systems, marketing and processing of products, feeding, working method and design (management plan).

Practical: Visits to experimental units with breeding units, introduction of different freshwater fish species, planning of a production unit.

### **362 (10) Wool Science (4l + 2p)**

The biology of the wool follicle and physical characteristics of wool. Shearing and shearing-pen organisation (management). The classing and class standards of wool. Wool processing and wool products as well as by-products of wool. The marketing of wool. Other natural fibres and synthetic fibres. Practical: The classification of wool. Merino-type wool according to class standards. Students receive a Springbok-head Certificate provided that they obtain above 60% for all sections of the practical. Management of a shearing shed. Visit to a wool processing plant.

**P Animal Production 262**

## **BIOLOGY (BIO)**

### **113 (15) Basic and cell biology (6l + 3p)**

Introduction to Biology, biologically important organic compounds, cell study, introductory morphology and anatomy of plants and animals. Taxonomy of the plant and animal kingdom.

Practical: Demonstrations with regard to processes that are studied.

### **143 (15) Biological processes (6l + 3p)**

Introductory plant and animal physiology, including physiological processes such as photosynthesis, transpiration, respiration, growth regulation, digestion, gas exchange and excretion, basic genetic studies.

Practical: Demonstrations with regard to processes that are dealt with.

**P Biology 113**

## **CELLAR MANAGEMENT (CMT)**

### **314 (20) Operational Management (8l + 2p)**

Operational management and the managing of the wine value chain: Determining and managing of product demands, capacity planning, managing resources. Compilation of the wine value chain, coordinating of orders, cost management, Legislation of liquor products, Excise duty and the wine certification. Practical: Demonstration of the wine value chain, visits to industry. Solving practical problem situations, group discussions, submit assignments (Wine online). Managing a wine value chain. Developing a wine (or alternative alcoholic product) operational business strategy.

**P Oenology 212, 242**

### **341 (5) Total Quality Management (2l + 2p)**

Acceptable systems with international status: Proof of continuous quality production methods, products and service delivery. This includes quality control and management, accreditation, environmental control, laboratory layout and maintenance.

Practical: Industry visits and assignment

**P Oenology 212, 242**

### **343 (15) Human Management (6l + 2p)**

Introduction to the basic aspects of human management in a changing environment: Basic human management issues, leadership and leadership development, change models and the management of change. Negotiation skills.

Practical: Group work and simulation. Submit assignments regarding personal leadership profile and leadership developing plan as well as the applying of this in practical situations.

**P Oenology 212, 242**

## **COMMUNICATION (COM)**

### **111 (5) Introduction to communication for innovation (2l + 3p)**

Communication and the construction of meaning. Definitions, concepts and principles of communication. Models of communication. Factors affecting communication. Basic communication forms, media, functional qualities and skills needed. Communication for rural innovation. Introduction to Persuasive communication and Academic literacy.

Practical: Suitable assignments are given in each section and applied individually or in groups.

### **211 (5) Persuasive communication and Academic literacy (2l + 3p)**

Principles for preparation of a message. Underlying factors affecting communication: Knowledge, perception, information, wisdom, life-worlds, culture. Persuasion techniques. Negotiation within interactive processes. Facilitating interactive processes. Research methodology and Academic literacy.

Practical: Suitable assignments are given in each section and applied individually or in groups.

**P Communication 111; Computer Literacy 112**

## **COMPUTER LITERACY (CPU)**

### **112 (10) Basic computer literacy (4p)**

The course is offered with the aid of practical, relevant assignments in each section where the theoretical concepts are applied and practised. Hardware components: Identification and functions of each, compilation of a basic system and basic maintenance. Windows: Basic concepts and skills of the Windows Operating System, file management, basic Windows program. MS Office: Identification of the components of Microsoft Office applications and its uses, data/information input, format of a document and its implementation. Internet: Connecting to the Internet and navigation on the Internet, components of an e-mail application and navigation. View page: Navigation in view page application, data input,

changing data, formatting, data processing and formulae, data output. PowerPoint: Drawing up of a presentation with the aid of PowerPoint, basic navigation, special effects.

**(Class mark serves as performance mark with 70% as minimum pass requirement.)**

## **CROP PROTECTION (CPP)**

### **141 (5) Safe handling of toxic substances (AVCASA) (2l + 3p)**

Introduction with regard to the chemical pest-control industry; registration and grouping of agents; toxicity of agents; storage, handling and transport of agents; application methods and equipment; climatic and environmental influences on control strategies.

Practical: Efficiency in using plant protection product manuals ("Bot se boek"), determination of LD 50 value; MRLs and periods during which different toxic groups and kinds of toxins are withheld; visits to toxin stores and planning of its layout; demonstration of specific kinds of apparatus; basic calibration calculations.

### **242 (10) Principles of crop protection (4l + 3p)**

Overview and origin of plant protection practices; grouping of problems and control components; classification, harmfulness and basic control strategy of plant pests; classification, harmfulness and basic control strategy of plant diseases; classification, harmfulness and basic control strategy of weeds; choice of control methods and control agents.

Practical: Aids for the identification of different pest groups, identification of correct control agents with the aid of technical publications.

**C Crop Protection 141**

**P Biology 113, 143**

## **ENTREPRENEURSHIP (ENT)**

### **221 (5) Principles of added value (2l + 3p)**

The entrepreneur: Why entrepreneurs start business undertakings. Problems: Main reasons for failure, characteristics (general, positive and negative). Functions: Availability, influences, economic significance and personal sources. The management and steps of innovation: Planning and methods of added value.

Practical: Applied practical examples. Developing a business strategy with production, manpower, financial and marketing plan.

**P Agribusiness Management 112, 142**

## **EXTENSION (EXT)**

### **212 (10) Sustainable livelihoods (4l + 3p)**

Social and cultural factors in extension. The institutional environment. Poverty alleviation, rural development and farm production. Farming Systems Approach. Sustainable Livelihoods. Observation & interview techniques

Practical: Suitable assignments are given in each section and applied individually or in groups.

**P Communication 111**

### **242 (10) Behavioural change and decision-making (4l + 3p)**

Innovation, adoption and diffusion. Farmers' decision-making, intention & behaviour. The theories of Lewin, Tolman, Fishbein & Ajzen, the theory of Reasoned Action. Models of decision-making. Experiential learning. Decision-making and risk management. Behaviour in search of improvements. Understanding human practices. Understanding the social nature of technical practices. Extension campaigns.

Practical: Suitable assignments are given in each section and applied individually or in groups.

**P Communication 211; Extension 212**

### **312 (10) Group dynamics and leadership (4l + 3p)**

Groups and group dynamics. Group formation. Effective team work. Leadership.

Conflict. Group facilitation. African leadership and styles.

Practical: Suitable assignments are given in each section and applied individually or in groups.

**C Extension 322**

**P Extension 212, 242**



### **322 (10) Extension management and profession (4l + 3p)**

Job profile, recruitment and performance criteria versus actual practices, activities and time allocation patterns. The extension mandate. Performance assessment, monitoring achievements and impact assessment under field conditions. The manifold demands on a professional extension agent. Challenges in extension management. HRD. Quality assurance, accountability, sustainability. Networks and linkage strategies. Training and professional development of extension staff. Information flows among the parties involved.

Practical: Suitable assignments are given in each section and applied individually or in groups.

**C Extension 312**

**P 212, 242**

### **344 (20) Programme planning (8l + 3p)**

Extension programme and an extension or development project. Institutional framework for community participation. Participative and needs appraisal.

Design of an extension programme. Evaluation and monitoring of extension programmes.

Practical: Suitable assignments are given in each section and applied individually or in groups.

**P Extension 242, 312, 322**

## **HORTICULTURE (HRT)**

### **212 (10) Introduction to fruit cultivation (4l + 3p)**

The fruit industry in SA and internationally; the morphology, physiology and seasonal growth cycle of a deciduous fruit tree; climate and other determining factors with regard to fruit type and cultivar choice; influence of climate on fruit production quality.

Practical: Morphology of pome and stonefruit; recordkeeping of phenological stages; visit commercial farms in different production areas; lectures by experts on the South African fruit industry and marketing of South African fruit on the export market.

**P Biology 113, 143; Soil Science 112, 142**

### **242 (10) Orchard establishment and propagation biology of fruit trees (4l + 3p)**

Propagation and top-working of fruit trees, orchard planning and establishment, young tree development, pollination and fruit set, fruit development and thinning. Practical: Orchard planning and establishment; budding of fruit trees, visit a fruit-tree nursery, training and pruning of trees; thinning of flowers and fruit.

**P Biology 113, 143; Soil Science 112, 142**

### **312 (10) Ripening and post-harvest physiology (4l + 2p)**

Ripening and post harvest physiology, maturity indexing, harvest and post-harvest

handling of fruit. Post-harvest physiological disorders and types of bruising/mechanical damage.

Practical: maturity indexing of pome and stone fruit; harvesting, grading and packing fruit; visit to packing facilities and cold stores, municipal market and harbour.

**P Horticulture 212, 242**

### **322 (10) Fruit production practices (4l + 2p)**

Soil preparation and fertilizing of deciduous fruit trees; pruning; irrigation; weed control and cover crops. Critical cultivation requirements for olives, kiwi fruit and guavas.

Practical: Making recommendations regarding soil preparation; fertilization calculations and recommendations; pruning of bearing pome and stone fruit trees; irrigation scheduling calculations and recommendations; morphology, growing and bearing habit, pruning of olives, kiwi fruit and guavas. Holiday work (2-3 weeks) on a fruit farm.

**P Horticulture 212, 242; Soil Science 212**

### **331 (5) Cultivation of cut flowers and foliage (2l + 2p)**

Introduction to the cut flower and foliage industry in the Western Cape and South Africa. Crops include Proteaceae, roses, chrysanthemums, tulips, alstroemeria and lily types. Morphology, anatomy, climate and other cultivation requirements. Cultivation practices: planting widths, irrigation, fertilisation, pruning; flower initiation; scheduling of flowering; colour development, pest and disease management, harvesting and post-harvest handling.

Practical: Visits to commercial nurseries and cut flower farms.

**P Soil Science 212**

### **332 (10) Post harvest management of and value-adding to fresh products (4l + 2p)**

Sorting, grading, packaging, cold storage, processing of fruit and/or vegetables (for example juicing, drying, caning, making jam), marketing options.

Practical: Visits to different processing plants and packing facilities, completion of independent projects.

**C at least one of Agronomy 322, 332, Horticulture 312, or Viticulture 313**

### **342 (10) Disease and pest management of deciduous fruit (4l + 2p)**

Diseases and pests: identification, monitoring and management; principles of integrated fruit production; Global-gap.

Practical: Doing an orchard monitoring course. Doing a Global-gap evaluation of a commercial fruit farm.

**P Crop Protection 242**

### **351 (10) Cultivation of alternative crops (4l + 2p)**

Fruit types that will be covered include persimmons, pomegranates, blueberries, raspberries, avocados, mangoes and pecan nuts. Morphology, growing habit and bearing habit. Phenology. Climatic and other cultivation requirements. Major production areas in the world and in South Africa. Important cultivars. Pollination requirements, planting widths, training systems, pruning, fertilisation and irrigation. Disease and pest control. Harvest and post-harvest handling.

Practical: Morphology of different kinds of fruit and cultivars. Tree development and pruning. Visits to commercial and processing units. Maturity indexing.

**P Horticulture 212, 242; Crop Protection 242**

### **352 (10) Citrus cultivation (4l + 2p)**

Origin, characteristics and economic importance; seasonal growth-cycle of the citrus tree; climatic requirements, important citrus production areas in the world and South Africa; citrus types, cultivars and rootstocks; citrus cultivation practices: fertilisation, irrigation, weed control, pruning, manipulations to improve fruit size and quality; pests and diseases of citrus; ripening, maturity indexing, harvest and post-harvesting handling.

Practical: Morphology of citrus types and cultivars. Tree development and pruning. Visit a commercial citrus farm, packing facility and juice plant. Maturity indexing of citrus.

**P Horticulture 212, 242; Crop Protection 242**

### **361 (5) Cultivation of alternative and fynbos crops for commercial use (2l +2p)**

Introduction to the fynbos and alternative crop industry of the Western Cape and South Africa. Crops include rooibos tea, honeybush tea, carob, salt bush and

waterblommetjies. Morphology, anatomy, climate and other cultivation requirements. Cultivation practices: planting widths, irrigation, fertilisation, pruning; flower initiation; scheduling of flowering; colour development; harvesting and post-harvest handling; processing of crops.

Practical: Visit to Rooibos tea farm and factory as well as other relevant commercial farms.

**P Soil Science 212; Crop Protection 242**

## **NATURAL RESOURCE MANAGEMENT (NRM)**

### **142 (10) Principles and dynamics of ecosystems (4l + 3p)**

Basic geography, development of the earth as part of the solar system, life processes in nature, the conservation concept and threats to the earth. Geomorphology and topography of RSA and location of regions; link between soil, climate and vegetation, with specific reference to RSA biomes. Climatology, seasonal nature of temperature and rainfall, regional variation in climate. Ecological geography, system approach, principles and dynamics of ecosystem structure, composition and functioning.

Practical: To study how weather stations function.

### **242 (10) Introduction to sustainable resource utilisation (4l + 3p)**

The environment as resource, management of ecosystems; human-environment interaction; biodiversity; geographical information systems.

Practical: Exposure to GI-systems, presentations by specialists from industry

**P Soil Science 112; Natural Resource Management 142**

### **311 (5) Nature conservation and legislation (2l + 2p)**

Environmental degradation, environmental conservation, environmental legislation. Practical: Visit various conservation actions in the Western Cape, presentations by specialists from industry

### **341 (5) Environmental assessment and legislation (2l + 2p)**

Study various important topics concerned with the concept of 'Sustainable Development', for example, environmental policies, environmental economics and environmental assessment. Discuss prominent South African environmental legislation which protects water, soil and air as natural resources.

Practical: Presentations by specialists from the industry, case studies

## OENOLOGY (OEN)

### **212 (10) Oenological chemistry and microbiology (4l + 3p)**

Important organic components of wine such as carbohydrates, proteins and lipids. The functioning as well as the inhibition of enzymes. Feeding and important metabolic paths for the survival of yeasts and bacteria. Overview of microbiology; different groups of micro-organisms; growth and development of micro-organisms; manipulation of micro-organisms; yeasts and fungi of the grape and wine; the evolution of micro-organisms during alcoholic fermentation.

Practical: Making up of culture media; isolation and identification of cultures; colouring tests on micro-organisms. Metabolic processes are demonstrated in hand with practical examples. Microvinification.

**PP Principles of Agricultural Science 111, 121, 141**

### **242 (10) Principles of wine preparation (4l + 3p)**

Overview of wine cultivation in South Africa and in other countries; types of wines and wine styles. Composition of juice, must and wine. Micro-organisms, enzymes, metabolic paths during alcoholic fermentation, malolactic fermentation.

Practical: Production methods and techniques of wine preparation, as well as wine types and brandy, are explained in broad details and applied on a small scale in practice. Wine evaluation is explained by means of practical examples. A variety of oenological analysis, such as pH, titratable acid, alcohol, sulphur dioxide, volatile acidity etc.

**P Oenology 212**

### **311 (5) Applied wine microbiology and wine analysis (2l + 2p)**

Micro-organisms involved in the winemaking process; the identification, selection and cultivation of wine related yeasts and bacteria; interaction of yeasts and bacteria during fermentation; yeast metabolism during fermentation, sugar metabolism, nitrogen metabolism, metabolism of organic acids, production of sulphur compounds.

Practical: Advanced wine analyses are dealt with, applied in practice or demonstrated.

### **313 (15) Grape quality, harvesting methods, and practical wine preparation (6l + 2p)**

Sampling, criteria for pressing ripeness, grape grading systems, harvesting techniques, transport systems, separators, presses, clarification techniques, juice balancing. Factors of importance during fermentation, temperature control, sulphur dioxide utilisation, malolactic fermentation.

Practical: Preparation and care of wines on a commercial scale by each student.

Practical research project, reporting. Wine analyses. Visits to cellars. Wine evaluation. All theoretical aspects are explained demonstratively and then applied in practice by each student individually or in group context.

**C Viticulture 313**

**PP Oenology 212, 242.**

### **321 (5) Applied wine chemistry and wine analysis (2l + 2p)**

Chemical composition of acids, sugars, fenols, colourants, aroma, flavouring agents and other natural compounds in grapes and wine. Characteristics of aqueous solutions (must and wine), pH, acidity and buffer action, the effect of potassium. Phenolic composition of grapes and wine. Oxidation of must and wine.

Practical: Advanced wine analyses are dealt with, applied in practice or demonstrated.

**PP Oenology 212, 242**

### **342 (10) Wine stabilisation and quality management techniques (4l + 2p)**

Colour extraction methods, phenolic chemistry and fining, tartrate stabilisation, oxidative stability. Filtration and bottling systems. Quality assurance and quality control. Assignments and reporting.

Practical: Practical care of wines. Preparation of different types of wine and related products. Wine evaluation. All facets of wine care are dealt with theoretically and applied in practice or demonstrated.

PP Oenology 212, 242

### **351 (5) Applied wine chemistry (2l + 2p)**

The formation of aromatic compounds and their role in wine, wine ageing aromas and strange aromas. Wine ageing with emphasis on oak. Brandy and distillation. Wine and health.

Practical: Advanced wine analyses are dealt with, applied in practice or demonstrated.

**C Oenology 342**

**PP Oenology 212, 242**

### **361 (5) Applied wine microbiology (2l + 2p)**

Yeast autolysis; killer yeasts; malolactic fermentation; botrytised wines; wine spoilage by micro-organisms; microbiology of cork spoilage; enzymes involved in the wine-making process.

Practical: Advanced wine analyses are dealt with, applied in practice or demonstrated.

**C Oenology 342**

**PP Oenology 212, 242**

## **PRINCIPLES OF AGRICULTURAL SCIENCE (PAS)**

### **111 (10) Basic principles of chemistry (4l + 3p)**

Atoms and atom structures are discussed here and include various concepts such as electrons, protons, atom mass as well as the electron structure of atoms and the periodic system of elements. Ions and ion formation and its importance in chemical equations. Concentration expressions, normality, molarity and chemical formulae are also dealt with. Chemical compounds as well as the characteristics of these compounds, solutions and acid base are placed in perspective. The physical behaviour of liquids and gasses, the characteristics of temperature, phase changes and the transmission of heat. Introductory organic chemistry is discussed including alkanes, alkenes, alkynes, alcohols, ethers, esters, aldehydes and ketones, carbocyclic acids, amines and amides.

Practical: Tutorials, demonstrations and compilation of modules.

### **121 (5) Applied mathematical calculations (2l + 3p)**

Units and conversions. Calculations by means of ratios. Calculation of the unknown by means of an equation. Changing the subject of an equation. Geometrical calculations (areas, volumes, angles, gradients and spacing). Compilation and use of tables and graphs.

Tutorials: Mathematical calculations

### **141 (5) Laboratory use and techniques (2l + 3p)**

Safety of laboratories and the uses of chemicals. Important chemicals used during agricultural analytical determinations. Different kinds of glassware that are available and the correct uses of these during analytical determinations. Concentration expressions and the practical mixing of different chemicals expressed in different concentrations. Volumetric and quantitative determinations (carried out in practice). Practicing the correct use of laboratory apparatus. The practical use and standardisation of pH meters. The practical use of microscopes as well as the making up of microscopic plates.

## **SOIL SCIENCE (BSS)**

### **112 (10) Introduction to soil science (4l + 3p)**

The origin of soils and its formation: Origin and composition of soil and soil-forming factors. Discussion of the most important physical characteristics of soil: Texture, structure, colour, consistency, overall density; soil air, soil temperature and soil water. Physical characteristics of soil and tillage: Problems arising as a result of tillage, soil compaction and crust formation. Organic and biological fraction of soil: Plant life in the soil, members of the animal kingdom, factors influencing soil microbe numbers, organic material, carbon and nitrogen in soil, sulphur as essential nutritional element in crop production, the phosphorus cycle.

Practical: Identification of rock formations, field procedure for the determination of texture, determination of soil colour according to Munsell colour charts, infiltration rate determinations for different textured soils.

### **142 (10) Principles of soil science (4l + 3p)**

Introductory chemistry: Chemical and physical changes, chemical elements and the periodic table, chemical compounds, ions and formulae, chemical equations, types of chemical reactions, the pH scale, oxidation and reduction. The colloidal and chemical characteristics of soil: The clay minerals in soil, charges and ion exchange in soil colloids, dispersion and flocculation, the swelling and shrinkage phenomenon in soil, soil acidity, brackish soils. Principles of plant nutrition: Study of individual plant nutrients. Fertilisers: Characteristics and uses. Determination of fertilising need: interpretation of soil analysis report. Soil and water for irrigation purposes: Brackish; drainage.

Practical: Oxidation figure determinations, pH determination in the laboratory, soil sample-taking methods, fertilisation recommendations according to soil analyses.

**P Soil Science 112**

### **212 (10) Applications of soil science (4l + 3p)**

Geological concepts and mineralogical characteristics of soil, description of the soil profile, development and classification of South African soils, the taxonomical soil classification system, identification of soil families, utilisation potential of soils, soil mapping and whole farm planning, profile modification through tillage.

Practical: Identification of rock formations as well as minerals, profile identification, soil mapping.

**P Soil Science 112, 142**

## **VITICULTURE (VIT)**

### **212 (10) Introduction to viticulture and propagation of the grapevine (4l + 3p)**

The introduction, history and scope of the vine industry; the classification, physiology, anatomy and morphology of vine; the influence of climate and soil on the performance of the vine; the different vineyard areas in South Africa; different propagation methods of the vine; the use of rootstock in the vineyard industry. Practical: Identification of rootstock; harvesting principles

**P Biology 113, 143; Principles of Agricultural Science 111, 121; Soil Science 112, 142**



### **242 (10) Establishment, development and pruning of the grapevine (4l + 3p)**

Planning the planting of a vineyard. Planting of vines, establishment methods, plant widths. The different types of trellis systems Pruning systems. Canopy management - sucker, tip, top and leaf removal.

Practical: Soil preparation practices; measuring of vineyard blocks; planting of vineyard (if applicable); winter pruning; training of young vines; canopy management such as sucker, tip, top and leaf removal.

**P Biology 113, 143; Principles of Agricultural Science 111, 121; Soil Science 112, 142**

### **313 (15) Cultivar studies, optimal ripeness and management of growth vigour and canopy density (6l + 2p)**

Study of the characteristics of the most important wine-grape cultivars. Cultivar planning for a farm. Grape berry development and maturity indexing. Different harvesting methods for wine-grapes. light management of the grapevine and its influence on vine performance.

Practical: Identification of wine-grape cultivars; block evaluation; maturity indexing; harvest collection and Seminar. (Farm planning)

**P Viticulture 212, 242**

### **321 (5) Fertilisation, cultivation and weed control (2l + 2p)**

Identification of deficiency symptoms of the grapevine; supply, maintenance and corrective fertilisation; cover crops and types of cultivation; the most important vineyard weeds, control measures and chemical agents against these weeds. Practical: Students are responsible for block management of individual blocks with

regard to the following: fertilisation of vineyard; vineyard cultivation; application of control measures against weeds; identification of weeds.

### **344 (20) Phenology, irrigation, disease and pest management, IPW, soil health and environmentally friendly agricultural practices (8l + 2p)**

Phenology of the vine, including dormancy and rest breaking; water requirement of the grapevine and irrigation management; development, identification and managing of the most important vineyard diseases; development, identification, monitoring and control managing of the most important economic vineyard pests; IPW. Managing soil health, alternative farming methods. The anatomy and functions of the vine root.

Practical: Students are responsible for block management of their individual blocks with regard to winter pruning of mature and young vineyards, managing of cover crops monitoring and managing of diseases and pests; Determining irrigation scheduling under various different circumstances. Seminar – environmentally friendly farming methods and biodiversity.

**P Viticulture 212, 242; Crop Protection 242**

### **352 (10) Table and raisin grape cultivation (4l + 2p)**

Table and raisin grape production in South Africa and in the world; characteristics and cultivation requirements of the most important table and raisin grape cultivars and rootstock cultivars; plant widths and trellis systems; vine development and pruning; dormancy and rest breaking; spring and summer treatments for table grapes (canopy management, crop control, bunch preparation, girdling); use of growth regulators for table grapes; physiological and other problems that have a detrimental effect on table and raisin grapes; ripening and maturity indexing; harvesting, handling and packing of table grapes; drying techniques and grading of raisins.

Practical: Identification of table grape cultivars; vine development, pruning, canopy management, crop control, bunch preparation, girdling, use of growth regulators, maturity indexing, harvesting, classing and packaging of table grapes. Visit to a commercial table grape farm, packing-shed and cold storage facilities. Holiday work on a table grape or raisin grape farm during pruning period and harvest season.

**C Viticulture 321; 313; 344; Entrepreneurship 221**

**P Viticulture 212, 242; Crop Protection 242**

### **NOTE:**

#### **Abbreviations:**

- C Co-requisite
- P Prerequisite – minimum predicate of 40% achieved
- PP Pass Prerequisite – minimum pass mark of 50% achieved