



Western Cape
Government

PROSPECTUS

Diploma in 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.

Table of Contents

CONTACT DETAILS	2
VISION	5
MISSION	5
ELSENBURG: A PROUD TRADITION.....	5
PROGRAMME FOR DIPLOMA IN AGRICULTURE.....	7
FIRST YEAR.....	7
SECOND YEAR.....	8
THIRD YEAR	9
CONTENT OF MODULES.....	10
AGRIBUSINESS MANAGEMENT (ABM)	10
AGRICULTURAL ENGINEERING (ENG)	11
AGRONOMY (AGR).....	12
ANIMAL PRODUCTION (ANP)	17
BIOLOGY (BIO)	24
COMPUTER SKILLS (CPU)	24
CROP PROTECTION (CPP)	25
EXTENSION (EXT).....	25
HORTICULTURE (HRT).....	26
NATURAL RESOURCE MANAGEMENT (NRM).....	28
OENOLOGY (OEN)	28
PRINCIPLES OF AGRICULTURAL SCIENCE (PAS)	30
RESEARCH AND SCIENTIFIC METHODS (RSM).....	30
SOIL SCIENCE (BSS)	30
VITICULTURE (VIT).....	31

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 DIPLOMA IN AGRICULTURE

FIRST YEAR

FIRST YEAR – STUDY OPTIONS			
PLANT- & ANIMAL PRODUCTION (A)	PLANT PRODUCTION (B)	ANIMAL PRODUCTION & (C)	CELLAR TECHNOLOGY (D)
(ABM) Agribusiness 110, 130 (BIO) Biology 110, 130 (PAS) Mathematics 110 (CPP) Crop Protection 110 (BSS) Soil Science 110, 130 (ENG) Agric EngineerENG 130 (CPU) Computer Skills 130 (EXT) Extension 110 (AGR) Agronomy 110 (AGR) Agronomy 130 (AGR) Vegetables 140 (ANP) Dairy cattle 130 (ANP) Small stock science 140	(ABM) Agribusiness 110, 130 (BIO) Biology 110, 130 (PAS) Mathematics 110 (CPP) Crop Protection 110 (BSS) Soil Science 110, 130 (ENG) Agric Engineering 130 (CPU) Computer Skills 130 (EXT) Extension 110 (HRT) Horticulture 110 (HRT) Horticulture 130 AND (VIT) Viticulture 130 OR (AGR) Agronomy 110 (AGR) Agronomy 130 (AGR) Vegetables 140	(ABM) Agribusiness 110, 130 (BIO) Biology 110, 130 (PAS) Mathematics 110 (CPP) Crop Protection 110 (BSS) Soil Science 110, 130 (ENG) Agric Engineering 130 (CPU) Computer Skills 130 (EXT) Extension 110 (AGR) Agronomy 130 (ANP) Animal Nutrition 110 (ANP) Dairy cattle 130 (ANP) Poultry 135 (ANP) Small stock science 140	(ABM) Agribusiness 110, 130 (BIO) Biology 110, 130 (PAS) Mathematics 110 (CPP) Crop Protection 110 (BSS) Soil Science 110, 130 (ENG) Agric Engineering 130 (CPU) Computer Skills 130 (EXT) Extension 110 (PAS) Basic Chemistry 120 (VIT) Viticulture 130 (OEN) Oenology 130
k = 120	k = 120	k = 120	k = 120

SECOND YEAR

SECOND YEAR – STUDY OPTIONS			
PLANT- & ANIMAL PRODUCTION (A)	PLANT PRODUCTION (B)	ANIMAL PRODUCTION & (C)	CELLAR TECHNOLOGY (D)
<p>(ABM) Agribusiness 210, 230 (ENG) Irrigation 210, (ENG) Spraying machines 230 (NRM) Environmental Studies 210 (EXT) Extension 230</p> <p>(AGR) Grain production 210 (AGR) Cult. of potatoes & onions 220 (AGR) Cool weather crops 230</p> <p>(ANP) Beef Cattle 210 (ANP) Small Stock, wool, meat 220 (ANP) Dairy herd management 230 (ANP) Sheep management 240</p>	<p>(ABM) Agribusiness 210, 230 (ENG) Irrigation 210, (ENG) Spraying machines 230 (NRM) Environmental Studies 210 (EXT) Extension 230</p> <p>(HRT) Post-harvest physiol. 210 (HRT) Fruit Production practices. 220 (HRT) Citrus Cultivation 230 (HRT) Pests & Diseases 240</p> <p>AND</p> <p>(VIT) Wine grape cult. 210 (VIT) Integrated wine production. 230 (VIT) Table & Raisin Grape cult 240</p> <p>OR</p> <p>(AGR) Grain production 210 (AGR) Cult. of potatoes & onions 220 (AGR) Cool weather crops 230</p>	<p>(ABM) Agribusiness 210, 230 (ENG) Irrigation 210, (ENG) Spraying machines 230 (NRM) Environmental Studies 210 (EXT) Extension 230</p> <p>(AGR) Grain production 210 (AGR) Cool weather crops 230</p> <p>(ANP) Beef Cattle 210 (ANP) Aquaculture 215 (ANP) Small Stock, wool, meat 220 (ANP) Dairy herd management 230 (ANP) Sheep management 240</p>	<p>(ABM) Agribusiness 210, 230 (ENG) Irrigation 210, (ENG) Spraying machines 230 (NRM) Environmental Studies 210 (EXT) Extension 230</p> <p>(VIT) Wine grape cult. 210 (VIT) Integrated wine production. 230 (VIT) Table & Raisin Grape cult 240</p> <p>(OEN) Wine making tech. 210 (OEN) Wine Biochem & Microbio. 220 (OEN) Wine chemistry 230 (OEN) Wine evaluation 240</p>
k = 125	k = 125	k = 120	k = 120

THIRD YEAR

THIRD YEAR – STUDY OPTIONS

- (RSM)** Scientific Methods 310
- (EXT)** Project Management 350
- (EXT)** Ext. in Practice 360

and only ONE of the following STUDY OPTIONS

- (AGR)** Agronomy 350
- (AGR)** Vegetables 360
- (ANP)** Aquaculture 340
- (ANP)** Large Stock 350
- (ANP)** Poultry 360
- (ANP)** Small Stock 370
- (HRT)** Horticulture 350
- (OEN)** Cellar Technology 350
- (VIT)** Viticulture 350

NB. It is the responsibility of the student to ensure that he/she is placed at an appropriate farming enterprise for completion of the Work Integrated Learning Component required in the final year of study.

k = 120

CONTENT OF MODULES

AGRIBUSINESS MANAGEMENT (ABM)

110 (5) Introduction to agribusiness management (2l + 3p)

Introduction to South African Agriculture. A comparison of the South African Agricultural sector with agricultural sectors in the rest of the world. Role players in agriculture and the whole process of the agricultural value chain. Some agro-economic concepts and terminology used in farming analysis and focusing on the changing agribusiness environment. Output and input terms. Economic and financial criteria to indicate the various levels of economic and financial surpluses or shortages. The strategic management and decision-making process and responsibilities of management.

130 (10) Economic planning principles for agribusiness (4l + 3p)

Production economic principles such as marginality, the production function and declining marginal yield. Input/output ratios, Cost principles and the application of it. The compilation of management information and farm-record systems for agribusinesses: The requirements; the definition, composition and format of financial statements with the relevant financial analysis.

Practical: The drawing up of a computerised financial management information system for a given agribusiness; case studies for the production economic planning principles and the various financial statements.

C Agribusiness Management 110, Computer practice 130

210 (10) Planning techniques for agribusiness managers (4l + 3p)

Farm planning: budgets, financing and financing sources. Introduction to obtaining credit, credit assessment, repaying ability, security, risk and rules when obtaining credit and providing credit, credit analysis plan and the cost of capital. Labour management: Employment, remuneration, staff empowerment and training, management styles, motivation and productivity, staff administration, Labour legislation, Trade unions.

Practical: Practical examples with regard to the analysis of management information will be dealt with on an ongoing basis.

P Agribusiness Management 110, 130, Computer practice 130

230 (10) Risk management and marketing (4l + 3p)

Types of risks, Risk management techniques, Risk calculation. Project planning and investment decisions in agribusiness. Evaluation of investment alternatives, capital budgets and various investment instruments/approaches.

Basic principles of marketing management. Micro and macro environment analysis of South African agriculture. Market analysis, Consumer behaviour, marketing information and research, market segmentation, elements of a marketing plan, added value, international trade and marketing alternatives.

Practical: Calculations with regard to risk management. Project planning and investment decisions will also be practically illustrated.

P Agribusiness Management 110, 130, Computer practice 130, Agribusiness Management 210

AGRICULTURAL ENGINEERING (ENG)

130 (10) Agricultural Structures (4l + 3p)

Agricultural structures: Farm buildings, Plans and specifications, Planning and selection of terrain, Building materials, Foundations: floors and walls, Layout of buildings, Sewerage systems, Calculation of material quantities.

Practical: Practicing of the basic techniques of welding (arc welding and gas welding)

P Principles of Agricultural Science 110

210 (10) Irrigation (4l + 3p)

Irrigation terminology, Water, Crop water relationships and climate, Rainfall, evaporation, evapotranspiration. Water measuring, Irrigation accessories, Selection of irrigation system, Planning of irrigation, Irrigation system evaluation. Pumps.

P Principles of Agricultural Science 110

230 (5) Spraying machines (calibration) (2l + 3p)

Types of machines. Working principles and application. Advantages of different types of pumps, blowers atomizers and hydraulic systems. Calibration examples and formulae.

Practical: Adjustments of different types of machines for calibration of spray in orchards, vineyards, vegetables and grain crops.

P Principles of Agricultural Science 110

AGRONOMY (AGR)

110 (5) Introduction to Vegetable Production (2l + 3p)

Introductory overview of the vegetable industry in South Africa. Influence of the environment on vegetable production. Tillage and irrigation practices. Plant nutrition. Seeds and crop establishment. Integrated pest management.

130 (5) Introduction to Agronomy (2l + 3p)

Introductory overview of the agronomy industry in the Western Cape. Growth and development of small grains. Influence of climate on plant growth. Adaptation of cool weather crops. Physiological aspects of grain yields. Different grain production systems.

P *Biology 110, Soil Science 110; Crop Protection 110*

C *Biology 130*

140 (10) Vegetables under controlled conditions (4l + 3p)

The influence of the environment on greenhouse vegetable production. Seedling production. The cultivation of vegetables under controlled conditions.

P *Crop protection 110, Soil Science 110; Biology 110; Agronomy 110*

210 (10) Production of grains (4l + 3p)

General crop management, crop rotation principles and planning, soil preparation and fertilization, conservation tillage principles and practices. Production practices of wheat, barley, oats, triticale, canola, lupines and alternative crops.

P *Agronomy 130; Biology 110, 130; Soil Science 110, 130*

220 (10) Cultivation practices and post-harvest handling (4l + 3p)

The cultivation of potatoes, onions, cucurbit crops. The post-harvesting handling of vegetables.

P *Biology 110, 130; Soil Science 110, 130; Agronomy 110*

230 (10) Weeds, insects, and diseases and harvesting and quality aspects of cool weather crops (4l + 3p)

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

P *Biology 110, 130; Soil Science 110, 130; Agronomy 130, 210*

350 (80) Agronomy (Work Integrated Learning)

Small Grains

This section will form chapter three of your final work report. This section has 5 assignments to address the situation statement of the production unit, Preparation of planting area and planting material, establishment and crop management, harvesting, storage and grading parameters. The following aspects must be addressed:

i. Situation evaluation of the production unit.

The student is expected to make a full and critical evaluation of the particular production unit using certain criteria as guidelines. Criteria which may be used include the locality of the production unit (using Cape Farm Mapper), size, climate (rainfall, temperature, evaporation rates, frost), soil types, soil physical and chemical properties, farm management structure, available labour and use of labour in the production unit, infrastructure and implements.

ii. Preparation of planting area and planting material.

After completing this assignment the student must have analysed the crop rotation system and soil selection for planting the different crops, and be able to modify the rotation system and selection process for optimal production. Students must be able to break down the existing cultivar selection and recommend alternative cultivars if necessary. The student must also explain the seed treatment necessity, methods and products used. Evaluate the existing crop rotation system, soil selection for crops and soil preparation. Discuss the benefits and negatives of the current rotation system and, if any, improvements you would make. Judge the current cultivar selections for all crops. Explain the seed treatment of the crops.

iii. Establishment and crop management

The student must be apply to apply the planting methods of each crop and have knowledge of the planting depth, -time and –width. He must also be able to analyse the management of the fertiliser program, the weed control program, the disease control program and the pest control program. In this assignment special attention must be given to the sowing method, planting depth, -times and –width. Attention should also be given to the fertilizer program (application composition, rates and times for each crop) and crop protection (weeds, disease and pest program for each crop).

iv. Harvesting, storage and grading parameters.

At the end of this assignment the student must have an understanding of the harvesting method(s) and when crops are ready for harvesting. They should be able to apply or explain the correct storage method and condition for the different crops. Students must also be able to discuss the grading parameters of the different crops. Of importance is the determination of the harvesting stage required for each particular crop and the different harvesting methods. Explain the storage method(s)

and conditions of the different crops and give detail discussion of the quality parameters of the different crops.

PP Agribusiness Management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110, 230; Agronomy 110, 130, 140, 210, 220, 230; Animal Production 130, 140, 210, 220, 230, 240

360 (80) Vegetables (Work Integrated Learning)

Vegetable Production

This section will form chapter three of your final work report. This section has 5 assignments to address the situation statement of the production unit, soil utilisation and soil preparation, propagation material, establishing, care, harvesting, packaging and marketing. The following aspects must be addressed:

i Situation statement of the production unit

A complete and critical evaluation of the production unit must be done in order to make recommendations for future changes to bring about optimal production. Criteria to be used for this evaluation include, inter alia, location of the production unit, climate (monthly and long-term averages of the different climate parameters), land use pattern, soil types with the physical and chemical characteristics, water (availability, quality and irrigation systems), labour, the adding of value (packaging, refrigeration and storing), markets, natural vegetation, invasive plants, pollution (water and soil), as well as theft.

ii The utilisation and preparation of soil

Theoretical knowledge must be used to describe the current situation and to evaluate it critically to make a recommendation for improvements. The correct choice of soil for the specific type of vegetable, soil rotation, soil preparation and fertilisation are aspects that should be addressed here.

iii Propagation material

The present situation regarding propagation material must be described and discussed in depth. Aspects such as different types of propagation material, the anatomy of seed, germination requirements and the storing of seed must be discussed. The different methods of producing healthy vegetable seedlings must be addressed, for example cuttings and seed potatoes.

iv Establishing and care

To ensure optimal production, it is essential to apply the correct practices for establishing and growth. The different times for sowing and planting, the transfer of

seedlings to new ground, pest control and any other practices to improve plant health must be evaluated critically.

v. Harvesting, packaging and marketing

Optimal income is ensured when a high quality product reaches the consumer. This means that harvest management as well as the management of the commodity after harvesting, are of utmost importance. The critical evaluation of methods for determining the correct harvesting stage (the effect different target markets have on this), packaging and the strategies to serve target markets, quality standards, regulations regarding packaging and marketing.

Tunnel production

This section will form chapter three of your final work report. This section has 6 assignments to address the situation statement of the production unit, the ideology of cultivation in a controlled environment, cultivation techniques, irrigation with nutrition, cultivation of the crop, harvesting, packaging and marketing. The following aspects should be addressed:

i. Situation statement of the production unit

A complete and critical evaluation of the production unit is necessary in order to make recommendations for future changes to bring about optimal production. Criteria to be used for this evaluation include, inter alia, the location of the production unit, climate (monthly and long-term averages of the different climate parameters), land use patterns, soil types with the physical and chemical qualities, water (availability, quality and irrigation systems), labour, the adding of value (packaging, refrigeration and storing), markets, natural vegetation, invasive plants, pollution (water and soil) as well as theft.

ii. The ideology of cultivation in a controlled environment

The current situation regarding structures must be evaluated and discussed, and recommendations regarding improvement must be made. Attention must be given to the origin of the concept, the different methods of cultivation in a controlled environment, the location of the unit, infrastructure, structures and costs.

iii. Different cultivation techniques

A description must be given of the current situation regarding cultivation methods, techniques and aids that are used. The different types, mediums, arrangement or spacing of plants and trellising techniques must be discussed and evaluated critically.

iv. Nutrition in irrigation

The current practices that are used, must be described and the different methods and techniques for using nutrition in irrigation, schedules for water and fertiliser application, layout and costs must be evaluated critically to ensure healthy plants.

v. The cultivation of crops

The correct practices for establishing and growing crops until harvesting, should be known and they should be described in detail. The choice of crop, the different times for sowing and planting, the procurement of plant material, the process of transferring plants to new soil and pest control must be described and evaluated critically.

vi. Harvesting, packaging and marketing

The current practices regarding the marketing of the product and the handling from the time of harvesting in order to generate the maximum income, must be discussed. Aspects such as determining the correct stage for harvesting (according to the target market), different practices for harvesting in order to ensure quality, the packaging of products (packaging according to the requirements of the target market), type of marketing, different markets, quality requirements and regulations regarding marketing, must be discussed and evaluated critically.

PP Agribusiness Management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110, 230; Agronomy 110, 130, 140, 210, 220, 230; Animal Production 130, 140, 210, 220, 230, 240

ANIMAL PRODUCTION (ANP)

110 (10) Animal Nutrition (4l + 3p)

Introduction to animal nutrition. Anatomy of digestive systems for monogastric- and ruminant farm animals. Digestion, Composition, Nutritional value, Energy and protein standards of feeds.

Practical: Identification of feedstuffs. Introduction to feed formulation

C Biology 110

130 (5) Dairy cattle (2l + 3p)

Introduction to dairy cattle. Dairy cattle breeds. The care and feeding of calves. The feeding of replacement heifers. Principles and management of dry cows. Feeding and management of the lactating dairy cow. Feeding standards of dairy cows. Feeding and care of the bull.

P Biology 110; C Biology 130

135 (5) Poultry Production (2l + 3p)

Poultry industry in South Africa. Management of different poultry enterprises: layer and broiler flocks. It also covers the farm layout with emphasis on biosecurity, poultry house design, poultry nutrition and health of the birds.

P Biology 110; Animal Production 110

C Biology 130

140 (5) Small Stock Science (2l + 3p)

Introduction to small stock production. History of sheep farming. The main types of sheep and their distribution. Developmental possibilities. Breeds: Merino, Dohne Merino, South African Mutton Merino, Dormer, Dorper and Boer goat

P Biology 110

C Biology 130

210 (10) Beef cattle (4l + 3p)

Introduction to beef cattle. Beef cattle breeds. Adaptation of cattle in their environment. Breeding and selection of beef cattle. Nutrition of beef cattle. Management of a beef cattle herd. Production systems.

P Biology 110; Biology 130

215 (5) Aquaculture (2l + 3p)

Species and their biology. Water quality and environment. Choice of premises. Development of production systems. Nutrition, Marketing and processing of products. Management plan.

P Biology 110, 130; Animal Production 110

220 (10) Small stock breeding, Wool and Meat Science (4l + 3p)

Reproduction guidelines, Selection techniques, Record keeping.

Wool Science: The organisation in the shearing-shed, Infrastructure. The physical properties of the wool. The class standards of the NWGA. The physical handling of wool. Trade types / Analysis of shearing reports. Baling and transportation of wool.

Meat Science: Growth and development. Treatment of slaughter animals and meat. By-products at the abattoir. Carcass classification of sheep meat. Breeding systems for slaughter lamb production.

P Biology 110, 130; Animal production 140

230 (10) Management of Dairy herd (4l + 3p)

Management of a dairy herd: Milk composition. Milk harvesting. Breeding and selection of dairy cattle. Facility design and health of the dairy cow.

P Biology 110, 130; Animal Production 130

240 (10) Sheep management Practices (4l + 3p)

Management guidelines for sheep farming. Ewe and ram management, management from lamb to weaning, infrastructure, animal health, feeding guidelines.

P Biology 110,130; Animal Production 140, Animal Production 220

340 (80) Poultry (Work Integrated Learning)

This section will form chapter three of your final work report. In the syllabus there will be concentrated on the practical principles of successful meat- and/or egg production, inclusive of the management of a broiler- or layer farm. Five assignments and one seminar have to be handed in during the study year on or before dates as specified. The seminar subjects can be changed by the lecturer to be more suitable for the student's study field.

i. The outlay and detail of the farm

Location: Give details of where the farm is situated. Details must be given regarding the location of the farm, including province, district, the location of the nearest city/town, as well as height above sea level. **Infrastructure:** Give a brief description of the infrastructure and physical facilities that exist. What supporting infrastructure does the operation require?

Challenges: Are there any challenges in regards to the farm's location? (Security, theft, distance from feed source and abattoir, markets, climate, water quality, available labour etc.) **Farm layout:** Give details of the layout of farm buildings and infrastructures (provide a map or drawing if possible).

Capacity: The size of the houses and how many birds they contain. **Systems:** Do they rear their own layers if it is an egg producing farm or if a broiler farm, do they have an all-in-all-out system or do they have birds with different ages on the farm? Is it an intensive housed, free

range or organic farm, also provide the advantages, disadvantages of the type of farming system they have. Providers: Who provides their chicks and how does the delivery process work?

ii. **House design and climate control and biosecurity**

House design: Describe the design of the houses (is it natural ventilated or mechanically controlled houses), and how it affects the controlling of the temperature inside. (Explain the roll and function of each design aspect of the house and how it helps with temperature control). **Biosecurity:** Describe the layout and design of the farm in regards to biosecurity (explain each aspect in detail). Critically evaluate their biosecurity plan and make recommendations if you think of anything that can be added or changed.

iii. **Management**

House preparation: Describe the process of the preparation of the house before the batch of new chickens arrives. Explain and evaluate the following:

- a. The brooding area and management of the brooding period (broilers) or the type of egg production system (cage or floor) and evaluate the advantages and disadvantages of this specific system they use. (layers)
- b. The choice of bedding they use.
- c. The result of wet bedding and how they try and prevent it.

New arrivals: How do they evaluate if the chicks they received are of good quality and explain how they are placed in their new environment. **Daily routine:** Describe daily routine tasks carried out in farming of broilers / layers on this farm visited by you. Your responsibility and involvement with these aspects must be described. **Stocking density:** What is the current stocking density in the house, provide any recommendation if there are any. **Temperature control:** Elaborate how temperature is management on the farm (ventilation, nutrition etc.) **Records:** Provide examples of records which are kept daily, weekly and monthly if possible. (Mortalities, weight gain, temperature etc.) **Labour:** Use an organogram to describe the structure and the labour force. Indicate the number of permanent, seasonal or contract workers as well as the variation in labour needs according to the production cycle. **Markets and marketing:** Describe the markets where products are supplied as well as the distance and different mechanisms for transport used. Give a brief description how the chickens or eggs are being marketed. **Waste management:** Explain how waste is being managed on the farm.

iv. **Nutrition**

Rations: Give a complete description of their different rations (the specs of the feed, and the format of the feed crumbs, or pellets.) **Phase feeding:** If they make use of phase feeding explain each phase in detail, explain why they have different rations and forms of feed. Give a critical evaluation by referring to the advantages, disadvantages and reliability of phase

feeding. Cost implication: Calculate costs of rations for every house as well as total feed cost. Make recommendations where costs can be saved in this regard. Feeding equipment: How do they feed it to the chickens (type of feeder), the number of feeders and drinkers per chicken? Can they control the intake of the chickens? Feed additives: Name all feed additives they use in the feed and the functions of it or reason it is included in the feed.

v. **Chicken Health**

Vaccination: Provide a complete vaccination program for this farm in table form.

External and internal parasites: What protocols are in place to protect the chicken and the house against external parasites? Inoculation: Explain the methods and procedure of inoculation they use on the farm.

Diseases: Elaborate on the 3 most common diseases or health problems in chickens found in the area. Health checklist: Develop a checklist to be used for regular inspections to detect signs of ill health in poultry.

PP Agribusiness Management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110, 230; Agronomy 130, 210, 230; Animal Production 110, 130, 135, 140, 210, 215, 220, 230, 240

350 (80) Large Stock (Work Integrated Learning)

Large Stock Production is mainly experiential training on a farm. Five assignments and one seminar have to be handed in during the study year on or before dates as specified. The seminar subjects can be changed by the lecturer to be more suitable for the student's study field. In the syllabus there will be concentrated on the practical principles of successful dairy- and/or beef production, inclusive of the management of a dairy- or beef cattle farm. The following aspects must be evaluated and addressed in detail and critically.

i. **Details of the cattle and the farming enterprise**

Location: Details must be given regarding the location of the farm, including province, district, the location of the nearest city/town, as well as height above sea level. **Grazing and pasture:** Discuss the natural vegetation in the area or cultivated pastures used for grazing or roughages. Identify and explain factors for decisions regarding which pasture cultivars to plant for optimum fodder flow throughout the year. **Infrastructure:** Give a brief description of the infrastructure and physical facilities that exists. What supporting infrastructure does the operation require? **Breeds and type of cattle:** Provide background of the breed currently farming with. Evaluate the breed policy and provide the motivation for farming with the current breed. Also make recommendations regarding future expansions or changes. **Herd composition:** Provide in table form the number of every type (production group), age and sex of cattle. Evaluate the herd composition critically.

ii. Breeding and selection

Bull selection: Provide factors and explain what to look for when selecting a bull for breeding or A.I. Are there any genetic improvements and corrections needed within the herd? **Breeding objectives:** Provide background on the type of breeding used on the farm (natural breeding, artificial insemination or multiple ovulation embryo transfer technology). Is there a specific breeding plan in place (linebreeding or crossbreeding systems)? Give a short description as well as a critical evaluation and recommendations of the selection principles of the breeding herd as it is applied on the farm. **Replacement ratio:** Provide the replacement ratio of the operation and explain the role of classing and culling in improving the average genetic merit of the herd.

iii. Nutrition

Rations: Describe the full list of rations that are fed to different groups of animals, with analysis of each ration and evaluate critically. **Feeding:** Give a brief description of mixing/feeding practices used on the farm. Give a critical evaluation by referring to the advantages, disadvantages and reliability of the methods. Your responsibility and involvement with these aspects must be described. **Cost implication:** Calculate costs of rations for every group of animals as well as total feed cost. Make recommendations where costs can be saved in this regard. **Fodder flow:** Give a full fodder flow program for the year of how much feed to preserve and conserve for drier months. Provide complete and accurate calculation of the quantity and quality of material required for the livestock production system. **Carrying capacity assessment:** Determine the potential of the pasture for stocking capacity to optimize the utilization of the natural veld and / or cultivated pasture. **Grazing system planning:** Elaborate on how the natural veld and / or pasture are utilized explaining the grazing system used. The pasture type, animal breed, climatic properties etc. will be the determinant of the grazing system chosen and refined to meet the production system's needs.

iv. Management

Calve management: Explain and evaluate the following management tasks of the calves: Dehorning, castration, ear-tagging/branding etc. Your responsibility and involvement with these aspects must be described. **Heifer management:** How do they successfully manage heifers to reach puberty at an optimal time? **Cow management:** Give a brief description of the routine husbandry tasks carried out and a critical evaluation of the management of dry cows and lactating cows.

Reproductive management: Describe the breeding seasons if used and explain why it is done in the mentioned period(s). Give a critical evaluation by referring to the advantages, disadvantages and reliability of synchronization programs and/ or controlled breeding and calving seasons, if it is being used. Describe the pregnancy diagnosis on cows and intercalving periods of cows on this farm.

Bull management: If bulls are being used on the farm, explain the bull to cow ratio used on the farm. Describe how breeding soundness are being evaluated in bulls.

Record keeping and performance testing: Give a brief description of the system of collecting, maintaining, and analysing an array of records from the farm. **Labour:** Use an organogram to describe the structure and the labour force. Indicate the number of permanent, seasonal or contract workers as well as the variation in labour needs according to the production cycle. **Markets and marketing:** Describe the markets where products are supplied as well as the distance and different mechanisms for transport used. Give a brief description how the (animals and/or beef on beef cattle farms) or (dairy products and milk on dairy farms) are being marketed. **Waste management:** Explain how waste effluent is being managed on the dairy farm/feedlot.

v. **Animal health**

Biosecurity: Discuss and give a critical evaluation of preventative health measures as applied on the farm. Design a biosecurity plan. Provide a vaccination program in table form and critically evaluate the operation's herd health program. **Diseases:** Elaborate on 5 most common diseases or health problems found in the area. **External and internal parasites:** Provide a dipping and dosing program that is used on the farm. **(Dairy cows*Milking routine):** What protocols are in place in the dairy to control mastitis? **(Beef cows*Annual Cow Evaluation):** Which quality checks are in place, to determine the reproductive success of the cow and to detect any physical conditions that might cause future problems?

PP Agribusiness Management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110, 230; Agronomy 130, 210, 230; Animal Production 110, 130, 135, 140, 210, 215, 220, 230, 240

360 (80) Small Stock (Work Integrated Learning)

This section will form chapter three of you final work report. Small Stock Production is mainly experiential training on a farm. Five assignments and one seminar have to be handed in during the study year on or before dates as specified. The seminar subjects can be changed by the lecturer to be more suitable for the student's study field. In the syllabus there will be concentrated on the practical principles of successful sheep and/or goat production, inclusive of the management of a sheep or goat farm. The following aspects must be evaluated and addressed in detail and critically.

i. Details of the small stock breeds and composition of the flock

Breeds and type of sheep / goats: Provide background of the breed currently farming with. Evaluate the breed policy and provide the motivation for farming with the current breed. Also make recommendations regarding future expansions or changes.

Flock composition: Provide in table form the number of every type (production group), age and sex of animals. Evaluate the flock composition critically.

ii. Reproduction and reproduction management

Rams: Provide factors and explain what to look for when selecting a ram for breeding. Preparing the ram for the mating season. **Ewes:** Management of ewes before and during mating. Discussion on management during early and late gestation. Provide different mating as well as different lambing systems and evaluate the system used on the farm critically. **Lambs:** Discuss management of lambs in full. Also give the selection criteria that are followed on the farm and give commentary on all these aspects with suggestions.

iii. Nutrition

Rations: Describe the full list of rations that are fed to different groups of animals, with analysis of each ration and evaluate critically. **Feeding:** Give a brief description of mixing/feeding practices used on the farm. Give a critical evaluation by referring to the advantages, disadvantages and reliability of the methods. Your responsibility and involvement with these aspects must be described. **Fodder flow:** Give a full fodder flow program for the year of how much feed to preserve and conserve for drier months. Provide complete and accurate calculation of the quantity and quality of material required for the livestock production system. **Carrying capacity assessment:** Determine the potential of the pasture for stocking capacity to optimize the utilization of the natural veld and / or cultivated pasture. **Grazing system planning:** Elaborate on how the natural veld and / or pasture are utilized explaining the grazing system used. The pasture type, animal breed, climatic properties etc. will be the determinant of the grazing system chosen and refined to meet the production system's needs.

iv. Animal health

Biosecurity: Discuss and give a critical evaluation of preventative health measures as applied on the farm. Design a biosecurity plan. Provide a vaccination program in table form and critically evaluate the operation's herd health program. **Diseases:** Elaborate on 5 most common diseases or health problems found in the area. **External and internal parasites:** Provide a dipping and dosing program that is used on the farm.

BIOLOGY (BIO)

110 (10) Cell biology (4l + 3p)

Cell biology, morphology and anatomy of plants and animals. Taxonomy of the plant and animal kingdom.

Practical: Demonstrations and activities related to morphology, anatomy and taxonomy of plant and animals.

130 (10) Biological processes (4l + 3p)

Plant and animal physiology that includes photosynthesis, transpiration, respiration, growth regulation, digestion, gas exchange and excretion. Basic genetic principles and application.

Practical: Demonstrations and activities related to photosynthesis, transpiration, respiration, gas exchange and excretion.

P Biology 110

COMPUTER SKILLS (CPU)

130 (5) Basic computer skills (2l + 3p)

Course is presented with the aid of practical, relevant assignments in each section, in which the theoretical concepts are applied and consolidated. Hardware components: Identification and the function of each, putting together a basic system and basic maintenance. Windows: Basic concepts and skills of the Windows operating system, file management, basic Windows programmes. MS Office: Identification of the components of Microsoft Office applications and their uses, import of data/ information, formatting of the document and its export. Internet: Connecting to the Internet and its navigation, components of an email, application and navigation. Spread sheets: Navigation in sight page application, importing data, changing data, format, data calculations and formulas, data export.

CROP PROTECTION (CPP)

110 (10) Crop protection (4l + 3p)

The state of plant protection practices. What is plant protection, Review of inception, Grouping of problems, Control components. Plant pests, Grouping of plant pests, Control strategy. Plant diseases, Grouping of diseases, Control strategy. Weeds, Grouping of weeds, Control strategy. Application of control measures, Selection of method. Selection of remedies, Safe handling of remedies, Grouping of remedies, Toxicity of remedies, Storing and handling. Application methods and equipment, Principles of techniques. Influence of climate.

EXTENSION (EXT)

110 (5) Communication and innovation (2l + 3p)

Introduction to communication for rural innovation. Message development, information flow and the communication process. Negotiation and facilitation of interactive processes. Critical factors that influence communication, perception and knowledge construction. Extension in practice and the communication strategy.

230 (1) Social dynamics and change (4l + 3p)

Introduction to rural sociology and the ethics philosophy and application of extension. Decision-making, behavioural change theories and social change. The sustainable livelihood approach and analysis of livelihoods, the innovation systems approach and multi-actor collaboration in value chains.

P Extension 110

350 (15) Project Management (6l + 3p)

Introduction to projects, project management and identifying stakeholders. Defining risk and constructing a work breakdown structure. Scheduling according to the triple constraints and managing group dynamics in a project team. Measuring progress, solving common problems and improving organisational project management.

P Agribusiness Management 110, Extension 110, 230

360 (15) Extension in Practice (6l + 3p)

Purposive social intervention, unintended consequences and programme development approaches. The change facilitator and change agency. Sustainable innovation towards designing social change programmes. The theory of change approach and systems perspective to capture complex and logic models and frameworks for social change and programme development.

P Extension 110, 230

HORTICULTURE (HRT)

110 (5) Introduction to Horticulture (2l + 3p)

Climatic zones and main production areas. Economic importance, Main markets and competitors of the South African deciduous fruit industry. Stages of tree development.

130 (10) Morphology & Cultivation Practices (4l + 3p)

Classification and morphology of deciduous fruit trees. Climate and fruit cultivation, Fertilisation, fruit set, Fruit development and thinning. Introduction to production practices.

P Biology 110; Soil Science 110

C Biology 130; Soil Science 130

210 (10) Post-harvest physiology (4l + 6p)

Production practices, ripening, maturity indexing, harvesting and post-harvest handling of fruit.

P Biology 110, 130; Soil Science 110, 130; Horticulture 130

220 (10) Fruit Production practices (4l + 6p)

Production practices, Soil preparation, Fertilisation, Pruning, Irrigation, Weed control and cover crops. Propagation and top-working of fruit trees, rootstocks.

P Biology 110, 130; Soil Science 110, 130; Horticulture 130

230 (10) Citrus Cultivation (4l + 6p)

Citrus Cultivation: Introduction, Origin, characteristics and economic importance of citrus, Climatic requirements, Production areas and economic importance, Citrus types, cultivars and rootstocks, Plant material, Citrus cultivation practices, Fertilisation, irrigation, weed control, Pruning, Manipulations to improve fruit set, size and quality, Ripening, maturity indexing, harvesting and post-harvest handling

P Biology 110, 130; Soil Science 110, 130; Horticulture 130

240 (10) Pests and Diseases of Deciduous Fruits (4l + 6p)

Application of the principles and techniques for identification, monitoring and control of pests and diseases of pome and stone fruit effectively and efficiently, against the background of principles of integrated fruit production. To understand the current issues about food safety and incorporate alternative methods in the control strategies.

P Biology 110, 130; Soil Science 110, 130; Horticulture 130

350 (80) Horticulture (Work Integrated Learning)

This section will form chapter 3 of your final work report. There are 4 tasks to address the situation statement, cultivar policy, crop estimates, crop control, harvest, handling, the development of young trees, summer pruning for mature trees and winter pruning for young

and mature trees. The following aspects must be evaluated and addressed in detail and critically.

i. Situation statement and cultivar policy

Location: Details must be given regarding the location of the farm, including province, district, the location of the nearest city/town, as well as height above sea level.

Climate: The long-term averages for temperature (minimum, maximum and average), rainfall, evaporation, relative humidity, wind speed and measurements of cold (1 May to 31 August) must be given in table format and must be discussed. Identify and explain the critical climatic factors for decisions regarding what type of fruit and what cultivars to plant. **Soil:** Give a brief description of the soil types and its uses, as well as the physical and chemical limitations of the soil types. **Water:** Water sources (river, borehole or irrigation canal) and the amounts of water must be discussed in detail. Water quality, storing and the irrigation systems that are used must be evaluated critically. **Labour:** Use an organogram to describe the structure and the labour force. Indicate the number of permanent, seasonal or contract workers as well as the variation in labour needs according to the production cycle. **Infrastructure:** Give a brief description of the infrastructure to indicate the packing sheds, processes and methods of storing. **Markets:** Describe the markets where products are supplied as well as the distance and different mechanisms for transport used. Specific detail must be given about the transport facility, airports and docks. **Cultivar policy:** Use a table to indicate the different fruit types and cultivars. This table must also include the grafted cultivars, rootstock cultivars, cross-pollinators, size (hectare) and age of each orchard, tree development, trellising systems and spacing. Evaluate the cultivar policy and provide the motivation for planting the current fruit types and cultivars. Also make recommendations regarding future expansions and replacements.

ii. Crop estimates, crop control, harvesting and handling

Give a brief description and critical evaluation of the thinning policy and practices used on the farm. Give a critical evaluation by referring to the advantages, disadvantages and reliability of the methods used for crop estimates and ripening indexes and the handling of fruit during harvesting, packaging and transport. The pre-refrigeration techniques, refrigeration and techniques for cold storage and considerations and decisions regarding storage in controlled atmosphere and natural atmosphere must be discussed briefly. The packouts of the current season must be compared to the long-term averages as well as operational averages. Your responsibility and involvement with all these aspects must be described.

iii. Young tree development and summer pruning of mature trees

The pruning, trellising and development of young trees and the summer pruning of mature trees must be described. Also describe your responsibilities and involvement with these practices.

iv. Winter pruning of young and mature trees

Give a brief description and critical evaluation of the pruning, trellising and development of young trees and winter pruning of bearing trees. Your responsibilities and involvement regarding these practices must be discussed.

PP *Agribusiness Management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110, 230; Horticulture 110, 130, 210, 220, 230, 240; Viticulture 130, 210, 230, 240*

NATURAL RESOURCE MANAGEMENT (NRM)

210 (10) Environmental studies (4l + 3p)

The earth - a holistic view. Soil-climate-vegetation relationships with specific reference to SA biomes. The state of South African resources. The philosophy with regard to sustainable agriculture. Introductory ecology

P *Biology 110, 130*

C *Soil Science 110, 130*

OENOLOGY (OEN)

130 (10) Origin of wine (4l + 3p)

The history of winemaking and various wine producing areas. The difference between old world and new world countries and their history. The history of the South African wine industry. Explore different wine styles – sparkling wine production, table wine production, sherry production and port production.

Practical: Assignment on the South African wine industry. A tasting comprising of different wine styles will be presented and visits to commercial wine farms that specialize in the abovementioned styles will be organized.

210 (10) Wine making techniques (4l + 3p)

The composition of grapes including sugars, nitrogen and volatile/non-volatile compounds. Microorganisms in wine and their impact on fermentation. Alcoholic fermentation and malolactic fermentation. Winemaking techniques- production of white and red wine.

Practical: Microvinification practical and report. Additional tutorials.

P *Biology 110*

220 (10) Wine Biochemistry and Microbiology (4l + 3p)

Basic wine chemistry and microbiology. Carbohydrates, lipids and proteins. Enzymes and their role and function. Metabolism of yeast and bacteria. Introduction to various microorganisms.

Practical: Relevant microbiology practicals. Relevant tutorials and assignments. P

Biology 110, Principles of Agricultural Science 120

230 (10) Wine chemistry (4l + 3p)

The role and function of phenolics in grapes and wine. Characteristics of aqueous solutions (wine and must) and its constituents. Understanding the concept of oxidation in must and wine and the components that influence it.

Practical: Oxidized wines will be tasted and dealt with. Wine analyses. P

Biology 110, Principles of Agricultural Science 120

240 (5) Wine evaluation (2l + 3p)

The sensory perception of wine. Wine faults. Wine Assessment. Wine and health. Brandy production and ageing. Chemical factors influencing brandy production and ageing.

Practical: Tastings and tutorials. Correct setup of various sensory analyses.

P Biology 110

350 (80) Cellar Technology (Work Integrated Learning)

The module will consist of the following topics to be covered: the criteria for the evaluation of ripeness and quality of grapes; the application of sulphur dioxide and ascorbic acid in winemaking with its actions prior, during and after fermentation with factors influencing its efficiency; the treatment of juice before fermentation with a focus on juice clarification techniques such as natural settling with and without enzymes, flotation and centrifugation; the balancing of juice with relation to pH and acidity, harvesting methods and processing techniques which involves juice and skin separation.

PP Agribusiness Management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110, 120; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110, 230; Principles of Science 120; Viticulture 130, 210, 230, 240; Oenology 130, 210, 220, 230, 240

PRINCIPLES OF AGRICULTURAL SCIENCE (PAS)

110 (5) Mathematical calculations (2l + 3t)

Units and conversion. Calculations by means of ratios. Calculation of the unknown by means of an equation. Changing the subject of an equation. Geometric calculations (areas, volumes, angles, inclines and spacing). Setting up tables and graphs and their uses.

Tutorials

120 (5) Basic Chemistry (2l + 3t)

General definitions and concepts of atoms, symbols, formulae and molar masses. Chemical bonding and molecular structure. Determine the concentration from known and unknown substances by using chemical reaction equations and ensure that the correct units are used. basic principles of acids and bases

RESEARCH AND SCIENTIFIC METHODS (RSM)

310 (10) Scientific Methods (4l + 3p)

Academic literacy, critical reading of scientific papers, communication, scientific writing and presentation skills. Scientific methods, methods and procedures to conduct research, analyse data and represent data. Data description, statistical probability, hypothesis testing, comparisons between samples, analysis of categorical data, correlation and regression. P Computer skills

SOIL SCIENCE (BSS)

110 (10) Soil formation and -physics (4l + 3p)

General definitions and concepts of soil formation and an understanding of the holistic purpose of soil in the landscape. Soil productivity and contributing factors that influence plant growth in commercial agriculture. Introduction to soil physical parameters such as: texture, structure, colour, consistency, overall density; soil air, soil temperature and soil water. Soil cultivation problems related to tillage practices; soil compaction and crust formation. Maintaining a favourable soil physical condition for sustainable agricultural use of land. Storage and movement of water in the soil-plant-atmosphere continuum and basic water-holding capacity concepts to sustainably manage the scarce natural resource of fresh water. Soil microbiology and the contributions of these diverse group of organisms to nutrient cycles, soil fertility and the environment. Conservation agriculture practises that promote healthy microorganism populations in the soil.

130 (10) Chemical properties of soil (4l + 3p)

Introductory chemistry to understand the basics of applied soil 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. Soil colloidal properties of soil; that requires knowledge of different non-swelling and swelling clay mineral types and their influence on cation adsorption capacity and soil fertility as a whole. Electrical charge development and ion exchange principles in soil colloids; occurring in the soil exchange complex. Aggregate stability as influenced by dispersion and flocculation. A comprehensive understanding of soil reaction (pH), plant nutrition and nutritional elements. Characteristics and use of fertilizers and other soil ameliorants to maintain soil fertility for future sustainable agricultural use of land. The impact of saline soils on commercial agriculture, reclamation of different brack types and importance of good quality irrigation water as a scarce natural resource.

P Soil Science 110

VITICULTURE (VIT)

130 (10) Viticulture (VIT) (4l + 3p)

The introduction, history and scope of the vine; the classification, morphology, physiology and anatomy of vine. The influence of climate and soil on the performance of the vine. The different vineyard areas in South Africa. The correct way to use and prepare soil for vineyard cultivation. Planning and planting of vines, establishing methods and plant spacing. Vine development, winter pruning and summer treatments of wine grapes. Different types of trellis systems for wine and table grapes. The different amplification, propagation and nursery techniques for the vine.

Practical: Identification and monitoring of phenological stages. Winter pruning and balancing vines. Training of young vines (if possible). Visiting farms with different types of trellis systems. Visit a nursery for propagation techniques. Application of summer foliage treatments such as suckering, tipping, topping and leaf removal.

P Biology 110, Soil Science 110

C Biology 130

210 (10) Wine grape cultivation (VIT) (4l + 3p)

Cultivar identification. Water requirements and irrigation of the vineyard. Monitoring and control of pests and diseases.

Practical: Identification of cultivars. Demonstration of different irrigation systems for vineyards. Identification and monitoring of pests and diseases.

P Biology 110, 130; Soil Science 110, 130; Viticulture 130

230 (10) Weed control and fertilisation (VIT) (4l + 3p)

Identification of deficiency symptoms of the grapevine; storage, 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.

P Viticulture 130, 210; Soil Science 130; Crop Protection 110

240 (10) Integrated production of wine and Table and Raisin Grape cultivation (4l + 3p)

Table Grape Cultivation: Introduction to table grape cultivation. Planting widths and trellis systems for table grapes. Vine development and pruning of table grapes. Dormancy and rest breaking. Spring and summer practices for table grapes, use of growth regulators. Physiological and other disorders affecting quality of table-grapes. Table grape cultivars and rootstock cultivars. Ripening, maturity indexing, harvesting, and post-harvest handling of table-grapes.

Raisin Grape Cultivation: Production and production areas for raisin grapes, Cultivars and clones for raisin production, Drying techniques.

Practical: Pruning of table grapes. Identification of table grape cultivars. Maturity indexing and post-harvest handling farm visit. Visit to raisin producer. Wine evaluation and wine evaluation techniques.

P Biology 110, 130; Soil Science 110, 130, Viticulture 130

350 (80) Viticulture (Work Integrated Learning)

Table grapes

This section will form chapter three of your final work report. It consists of 8 subsections and 2 compulsory short courses, namely the SAWWV table grape short course and the course in soil classification, plotting and the planning of resource use. Written proof of the successful completion of this short course with the accompanying report must be handed in and the student is responsible for ALL arrangements in this regard. In this section the situation statement, cultivar policy, block evaluation, plant distance, establishment, vine development, pruning, fertilising, irrigation, disease control, insect control and weed control, principles of integrated fruit production, the safe handling and storing of agrochemicals, dormancy breaking, foliage management, crop management, bunch manipulation, crop estimates, harvesting, handling, packaging, storing and Global GAP evaluation are addressed. The following aspects must be covered in the different subsections:

i. Situation statement

Location: Details must be provided regarding the location of the farm, including province, magisterial district, location with regard to the nearest city/town and height above sea level. **Climate:** The long-term averages for temperature (minimum, maximum and average), rainfall, evaporation, relative humidity, wind speed, heat units (1 September to 30 April), cold units (1 May to 31 August) and hours of sunshine must be given in table format and discussed. Identify and explain the climatic factors that are essential in the decision regarding table grape cultivars that may be planted. **Farm maps:** Aerial photographs (that can be read as well as trigonometric) must be supplied. The boundaries of the farms must be indicated clearly on the aerial photograph. A land use map that is to scale must be provided and the area of all subdivisions must be indicated. A map indicating the outlay of the irrigation system must be provided and a map of the farm yard must be drawn and discussed in order to do a critical evaluation of the outlay. **Soil:** Refer to the land use map and indicate the soil types that occur on the farm. Also indicate what the soil is used for. Discuss the different types of soil with regard to physical and chemical qualities such as depth, colour, appearance of layers, slope, pH, texture in topsoil, subsoil, structure, drainage, water retention ability and the state of nutrition. Give a brief description of actions performed during soil preparation and then evaluate it critically. **Water:** Amount of irrigation water available, water rights, servitudes, water supply (stability and source of water), quality, storage as well as the irrigation systems used, must be discussed and evaluated critically. **Labour:** Use an organogram to describe the structure and labour force. Indicate the number of permanent workers, seasonal or contract workers as well as the variation in the need for labour during the production cycle. **Infrastructure:** Give a brief description of the infrastructure to indicate the packing sheds, processes and storage. **Markets:** Describe the markets where produce is supplied as well as the distance and different transport methods used. Specific detail must be supplied regarding the transport facility, airports and harbours. **Ecology, preservation and wildlife:** Provide a complete list of vegetation, birds, mammals, rodents and insects that are found on the farm and discuss the most important problem species and the way in which they are handled. Explain the impact of visible erosion, pollution, poaching, trespassing, the destruction of natural vegetation, overgrazing and theft of crops, livestock and equipment on the farm. **Land use:** Give a critical evaluation to indicate whether the pattern of land use brings about the optimal use of the available resources.

ii. Cultivar policy and block evaluation

Provide full detail about the table grape cultivars planted on the farm in order to address the number of hectares of each vineyard, age, rootstock cultivars, trellis systems and spacing. The cultivar policy must be evaluated critically. One bearing

vineyard block must be evaluated on the prescribed form. Make recommendations where applicable.

- iii. **Plant distances, establishing, vine development and pruning:** Give a brief description of the taking of soil and leaf samples. Focus specifically on time and techniques. Give examples of the results of analyses and do a critical evaluation. Method, time and type of fertiliser used must be discussed and costs must be calculated for each block in order to determine the total cost of fertiliser for the farm.
- iv. **Irrigation:** Give a brief description of the seasonal water requirements of the crop and the critical stadiums of the growth cycle regarding turgor. The irrigation system(s) and irrigation schedules must be evaluated critically.
- v. **Disease, insect and pest control and principles of integrated fruit production:** Give a brief description and critical evaluation of the disease, insect and pest control practices used on the farm. Evaluate the application of the principles of integrated fruit production by identifying, monitoring and controlling fungal, bacterial and virus diseases as well as physiological deviations.
- vi. **Weed control, cover crops and the principles of integrated fruit production:** Give brief details of the weed spectrum, the choice of control agents, doses and control periods, time and circumstances of application, cover crops (type, time and manner of establishing, maintenance) as well as the total cost of control. Perform a thorough critical evaluation of weed control practices and the application of the principles of integrated fruit production in vineyard floor management.
- vii. **Safe handling, storing and application of chemical:** Give brief details about poison storage, the keeping, handling and application of agrochemicals, the cleaning of equipment, withholding periods for local and export markets as well as other safety aspects that apply. Perform a thorough critical evaluation of the safety aspects regarding the handling, storage and application of agrochemicals.
- viii. **Dormancy breaking, foliage management, crop control and bunch manipulation:** Explain why or why not problems are experienced with dormancy breaking and the resulting delayed budding on the farm. Give a critical evaluation of the manipulation and chemicals used to promote dormancy breaking. Give a brief description of foliage management, crop control, bunch manipulation (physical and chemical) and perform a thorough critical evaluation of these practices.

PP Agribusiness Management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110, 230; Principles of Science 120; Viticulture 130, 210, 230, 240

Wine grapes

This section will form chapter three of your final work report. It consists of eight subsections and one compulsory course, namely the IPW course. A certificate of attendance and successful completion of this course should be submitted together with your final work report.

The following aspects must be covered in the eight different subsections:

i. Situation statement

Details must be provided regarding the location of the farm, including province, magisterial district, location regarding the nearest city/town and height above sea level.

Give a critical evaluation to indicate whether the pattern of land use brings about the optimal use of the available resources.

Provide a complete list of vegetation, birds, mammals, rodents and insects that are found on the farm and discuss the most important problem species and the way in which they are handled. Explain the impact of visible erosion, pollution, poaching, trespassing, and the destruction of natural vegetation, overgrazing and theft of crops, livestock and equipment on the farm.

ii. Evaluation of production and harvest records of all vineyard blocks and cultivars. Discuss the cultivar policy and evaluate the existing vineyard blocks.

Provide full detail about the wine grape cultivars planted on the farm in order to address the number of hectares of each vineyard, age and rootstock cultivars. The cultivar policy must be evaluated critically. Make recommendations where applicable.

Provide harvest records of the past three years of all vineyard blocks. Discuss seasonal deviations and reasons for these deviations from the norm, if applicable.

iii. Evaluation of cultivation practices, weed control and fertilisation practices Give a brief description of the taking of soil and leaf samples. Focus specifically on timing and techniques. Give results of the analyses and do a critical evaluation. Method, time and type of fertilisation must be discussed and costs must be calculated for each block in order to determine the total cost of the fertiliser for the farm.

Give brief details of the weed spectrum, the choice of control agents, doses and critical periods, time and circumstances of application, cover crops (type and manner of establishing, maintenance) as well as the total cost of weed control.

Perform a thorough critical evaluation of weed control practices and the application of the principles of integrated grape production in vineyard floor management.

iv. Evaluation of soil preparation, plant spacing and trellis systems

Give a brief description of actions performed during soil preparation and then evaluate it critically.

Provide full detail about the trellising systems and plant spacing used on the farm and evaluate critically.

v. Evaluation of soil, climate and cultivar policy (include map of farm with vineyard blocks as well as soil map)

The long-term averages for temperature (minimum, maximum and average), rainfall, evaporation, relative humidity, wind speed, cold units (1 May to 31 August), heat units (1 September to 30 April) and hours of sunshine must be given in table format and discussed. Identify and explain the climatic factors that are essential in the decision regarding wine grape cultivars that may be planted.

Farm maps: Aerial photographs must be supplied. The boundaries of the farm must be indicated clearly on the aerial photograph. A land use map that is to scale must be provided and the area of all subdivisions must be indicated.

Soil: Refer to the land use map and indicate the soil types that occur on the farm. Also indicate what the soil is used for. Discuss the different soil types regarding physical and chemical qualities such as depth, colour, appearance of layers, slope, pH, texture in topsoil, structure, drainage, water retention ability and the state of nutrition.

vi. Evaluation of young vine development, establishment methods and winter pruning

Critically evaluate the methods for young vine training executed on the farm. Discuss time of planting, soil condition, water status of the soil as well as implements used and labour input.

Evaluate different methods of winter pruning as applied on the farm. Critically evaluate the method(s) and make recommendations where applicable. Discuss timing of winter pruning and the influence of timing on budbreak and fertility.

vii. Evaluation of irrigation methods, pest and disease control as well as record keeping of IPW principles.

Give a brief description of the seasonal water requirements of the grapevine and the critical stages of the growth cycle.

Using the land use map as provided in (v), the outlay of the irrigation system must be provided, and a map of the farmyard must be drawn and discussed in order to do a critical evaluation of the outlay.

Discuss the amount of irrigation water available, water rights, servitudes, water supply (stability and source of water), quality, storage as well as the irrigation systems used and evaluate critically. The irrigation system(s) and irrigation schedule must be evaluated critically.

Give a brief description and critical evaluation of the disease, insect and pest control practices used on the farm. Evaluate the application of the principles of integrated control by identifying, monitoring and controlling fungal, bacterial and viral diseases as well as pests.

Give brief details about the poison storage, the keeping, handling and application of agrochemicals, the cleaning of equipment, withholding periods as well as other safety measures that may apply. Perform a thorough and critical evaluation of the safety aspects regarding the handling, storage and application of agrochemicals.

viii. Evaluation of summer canopy management practices and crop control. Discuss the labour force and compile an annual vineyard work program for the specific farm.

Use an organogram to describe the structure and labour force. Indicate the number of permanent workers, seasonal or contract workers as well as the variation in the need for labour during the production cycle. Draw up a vineyard work program for the specific farm.

Give a brief description of the canopy management and crop control executed on the farm and perform a critical evaluation of these practices.

PP Agribusiness management 110, 130, 210, 230; Biology 110, 130; Principles of Science 110, 120; Crop Protection 110; Soil Science 110, 130; Agricultural Engineering 130, 210, 230; Computer Skills 130; Extension 110; 230; Viticulture 130, 210, 230, 240

NOTE:

Abbreviations:

C Co-requisite

P Prerequisite – minimum predicate of 40% achieved

QQ Pass Prerequisite – minimum pass mark of 50% achieved