GENERAL EDUCATION AND TRAINING CERTIFICATE
FOR ADULTS

NQF LEVEL 1

SUBJECT STATEMENT

APPLIED AGRICULTURE AND AGRICULTURAL
SCIENCES CURRICULUM STATEMENT

JULY 2017
CURRICULUM STATEMENT FOR THE GENERAL EDUCATION AND TRAINING CERTIFICATE FOR ADULTS (GETCA)

Department of Higher Education and Training
123 Francis Baard Street
Private Bag X174
Pretoria 0001
South Africa

Tel: +27 12 312-5911
Fax: +27 12 321-6770

www.dhet.gov.za
© 2017 Department of Higher Education and Training
# GETCA CURRICULUM
## APPLIED AGRICULTURE AND AGRICULTURAL SCIENCE

### Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>2</td>
</tr>
<tr>
<td>Aims</td>
<td>3</td>
</tr>
<tr>
<td>Exit-Level Outcomes</td>
<td>4</td>
</tr>
<tr>
<td>Taxonomy and Weighting of Exit-Level Outcomes</td>
<td>5</td>
</tr>
<tr>
<td>Scheme of Assessment</td>
<td>5</td>
</tr>
<tr>
<td>Structure of the Examination Papers</td>
<td>5</td>
</tr>
<tr>
<td>Guidelines for Lecturers and Materials Developers</td>
<td>6</td>
</tr>
<tr>
<td>Guidelines for Practicals / Activities</td>
<td>6</td>
</tr>
<tr>
<td>Assumptions about Prior Knowledge and Skills</td>
<td>8</td>
</tr>
<tr>
<td>THEME 1: AGRICULTURE AS AN APPLIED SCIENCE</td>
<td>9</td>
</tr>
<tr>
<td>Introduction</td>
<td>9</td>
</tr>
<tr>
<td>Rationale for Content Selection</td>
<td>9</td>
</tr>
<tr>
<td>Content Structure</td>
<td>9</td>
</tr>
<tr>
<td>THEME 2: SUSTAINABLE CROP PRODUCTION</td>
<td>16</td>
</tr>
<tr>
<td>Introduction</td>
<td>16</td>
</tr>
<tr>
<td>Rationale for Content Selection</td>
<td>16</td>
</tr>
<tr>
<td>Content Structure</td>
<td>16</td>
</tr>
<tr>
<td>THEME 3: SUSTAINABLE LIVESTOCK PRODUCTION</td>
<td>26</td>
</tr>
<tr>
<td>Introduction</td>
<td>26</td>
</tr>
<tr>
<td>Rationale for Content Selection</td>
<td>26</td>
</tr>
<tr>
<td>Content Structure</td>
<td>27</td>
</tr>
<tr>
<td>THEME 4: AGRICULTURAL PRODUCTION MANAGEMENT PRACTICES IN RELATION TO SOCIO-ECONOMIC ENVIRONMENT</td>
<td>31</td>
</tr>
<tr>
<td>Introduction</td>
<td>33</td>
</tr>
<tr>
<td>Rationale for Content Selection</td>
<td>33</td>
</tr>
<tr>
<td>Content Structure</td>
<td>33</td>
</tr>
<tr>
<td>Suggested Study Hours</td>
<td>39</td>
</tr>
</tbody>
</table>
Introduction

The focus of Applied Agriculture and Agricultural Sciences is on the importance of relationship building between the environment and sustainable crop and livestock production. Applied Agriculture and Agricultural Sciences discusses in detail the influence of sustainable crop and livestock production on the environment. It builds the learners’ understanding of agricultural production management practices in relation to the socio-economic environment.

The subject covers four major themes; (1) Agriculture as an applied science, (2) The physical and biological environment in relation to sustainable crop production, (3) The influence of the environment on sustainable livestock production, and (4) Agricultural management practices in relation to the socio-economic environment.

Lectures will be offered to students on theoretical aspects while students will get practical exposure on farms where necessary and possible. Practical sessions will give students a working knowledge of principles and economics of crop and livestock production and their interaction with farming systems at different levels.
Aims

1. Provide a worthwhile educational experience for all adult students to enable them to acquire sufficient understanding and knowledge to:
   1.1. become confident citizens of South Africa, able to take or develop an informed interest in matters of agricultural importance;
   1.2. recognise the usefulness, and limitations, of the scientific method, and to appreciate its applicability in other disciplines and in everyday life;
   1.3. be suitably prepared for further study in related natural science fields.

2. Develop thinking and process skills that:
   2.1. are relevant to the study of applied agriculture and agricultural science;
   2.2. encourage curiosity about agricultural ventures;
   2.3. develop accurate and precise observation;
   2.4. promote logical and critical thinking and self-reflection;
   2.5. promote effective communication.

3. Develop attitudes relevant to agricultural science such as:
   3.1. objectivity;
   3.2. integrity;
   3.3. creativity and
   3.4. perseverance

4. Stimulate interest in the South African and global agricultural practices and business ventures

5. Promote an awareness that:
   5.1. the study and practice of agriculture are co-operative activities, which are subject to socio-economic and political influences;
   5.2. the applications of agricultural principles may benefit or harm the community and/or the environment;
   5.3. if used responsibly, agriculture can enhance meaningful social, political and economic development.
Exit-Level Outcomes

By the end of this course, students should be able to:

1. Understand and use subject-specific knowledge with regard to:
   1.1. various agricultural fields and ventures, facts, concepts, definitions, principles, theories and laws;
   1.2. agricultural vocabulary, terminology and discourse;
   1.3. sustainable agricultural practices;
   1.4. agricultural and technological applications with their social, economic and environmental implications.

2. Know and apply subject specific skills, namely:
   2.1. demonstrate an understanding of agriculture and its relationship with other natural sciences;
   2.2. show insight of how various agricultural disciplines are linked;
   2.3. apply knowledge acquired in assisting subsistence and commercial farmers;
   2.4. solve problems in familiar and novel contexts;

3. Understand, adopt and apply the values related to the subject, namely:
   3.1. use agricultural knowledge effectively and critically, showing responsibility towards the environment and the welfare of others;
   3.2. display an insight into different land ownership and tenure systems for effective agricultural production;
   3.3. uphold ethical business principles to an agricultural enterprise;
   3.4. demonstrate an understanding of entrepreneurial principles applicable to agricultural ventures;
   3.5. display sound knowledge of the role and importance of human resources in agricultural production
   3.6. display an understanding of appropriate and relevant agricultural practices
Taxonomy and Weighting of Exit-Level Outcomes

<table>
<thead>
<tr>
<th>THEME</th>
<th>CREDITS</th>
<th>WEIGHTING% / MARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Demonstrate an understanding of agriculture as an applied science</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Demonstrate an understanding of the physical and biological environment and its relationship to sustainable crop production</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>Assess the influence of the environment on sustainable livestock production</td>
<td>9</td>
</tr>
<tr>
<td>4</td>
<td>Demonstrate an understanding of agricultural production management practices in relation to the socio-economic environment</td>
<td>9</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

Scheme of Assessment

The final assessment mark will consist of site-based assessments (formative/continuous assessments) as well as a challenge exam (a nationally set summative assessment), which may be repeated if failed. All site-based assessments combined will have a weight of 50% of the final assessment mark. The summative assessment (national examination) will contribute the other 50% of the final mark. The examination question paper will be written out of 100 marks. The duration of the paper will be 3 hours. The paper consists of four sections namely Section A (10 marks), Section B (30 marks), Section C (30 marks) and Section D (30 marks), based on the four studied themes.

Structure of the Examination Papers

The site-based assessment (SBA) is made out of an educator’s guide and a learner’s tasks. The learner's tasks for each learning area contain four assessment tasks focusing on the themes that should be covered in formative assessment. The educator’s guide contains the assessment instrument(s) (memorandum, rubric and/or checklist) for each of the assessment tasks. The tasks include a variety of appropriate assessment strategies and different forms of assessment of which one is a project as prescribed by Umalusi. Additional is a learning area assessment plan, which is aimed at assisting the educator with the spreading of the formal assessment tasks throughout the year.

Each SBA task is worth 50 marks and the four SBA tasks total 200 marks. All formal and informal assessment leading to formal moderation must be recorded accordingly. These marks should be converted to 50%, which is the weighting of the site-based assessment. Moderation of these SBA tasks must be done according to the provincial management.
plan on the conduct, administration and management of the GETCA examinations and assessment.

**Guidelines for Lecturers and Materials Developers**

Applied Agriculture and Agricultural Science is intended to equip adult students in the Community College sector with general, foundational applied agriculture knowledge, skills and values. While recommended, not all students will be pursuing contact sessions at a Community College and/or learning site and many students may be engaged in self-study. The curriculum seeks to open up ‘second chance’ learning and/or opportunities for adult students who have had limited or no access to continuing education and training. The successful completion of the GETCA allows a self-directed student to access further studies and/or various pathways of progression to meet their aspirational life goals; whether this is to enter into farming, the world of work or progress to professional qualifications. The GETCA is for a diverse adult student target audience seeking to obtain (a) qualification(s) and it caters for adult and out-of-school learners aged 18 years or older.

Being adults, students have limited time available for study, as they have to simultaneously deal with and balance multiple roles and responsibilities. Therefore, teaching and learning should be adapted for this target group. Learning should enable/support students to move towards greater autonomy, independence and self-reflection in their lives, while enhancing student capabilities to contribute and participate in society and the broader communities in which they live.

Because GETCA is flexible, teaching and learning should be responsive to adult student needs as some students may seek to complete the qualification and/or aspects of the qualification through self-study while pursuing other goals. Similarly, the GETCA must allow for the development of students with little or no formal schooling to engage with their own learning such that higher order thinking in respect of core knowledge and skills is developed and a strong foundation laid for progression/ articulation with other qualifications such as NASCA on successful completion of the GETCA. Activities and content should be based on familiar and everyday examples.

The structure of the GETCA accommodates a variety of learning delivery options- face-to-face, distance as well as the possibility of private tuition and self-study, for example, through electronic technology-assisted teaching. Full- time and part-time study can be accommodated by the qualification structure and design.

**Guidelines for Practicals / Activities**

It is recognized that that many of the students will be learning in resource-scarce environments, and some of the students may be part-time. A lot of innovation is therefore required from the lecturer. The lecturer is advised to use these guidelines based on what is locally available and possible under the student circumstances. Most practical activities should be organised over the weekends when most students will be
available to participate. The following are suggestions of how the students can be exposed to practical aspects of the course:

- **Organised Visits to Farm Enterprises:** The lecturer should arrange for students to visit surrounding farms depending on the topic being covered. For example students can visit a dairy farm. At the farm the students should be taken through the whole enterprise, followed by a plenary question and answer session. As soon as the students finish, a short test or assignment (Practical Assessment Tasks – PAT’s) can be given to assess the understanding of the enterprise. Examples of enterprises that can be visited include field crop, fruit and vegetable farms, livestock enterprises, farm equipment and agrochemical companies.

- **Laboratory Visits:** Students can be taken to tertiary institution laboratories, for example a soil laboratory. The purpose of this practical will be to show the different types of equipment and demonstrate how some of the equipment is used. The importance of safety and handling of chemicals should be explained by a qualified lab technician. Students can be shown examples of laboratory analysis results and practise how to interpret the results. Regular study tours can also be arranged to nearby universities and institutions that have facilities that students can be allowed to use for a few hours per month. This will depend on the proximity of the institutions.

- **Attendance of field days/demonstrations or farmers’ days:** Many provinces hold farmers days on an annual basis. Students can be organised to attend these functions and see the equipment and learn some of the skills that will be demonstrated to farmers. Where resources allow, the lecturer can participate in the preparations and activities together with the students.

- **University and tertiary institution open days:** Almost all universities and agricultural institutions hold annual open days to attract new students. On these days institutes showcase and demonstrate the use of agricultural equipment and some other agricultural activities. The lecturer can arrange attendance for the students, and some of the students can be encouraged to volunteer to be part of the open days.
• **Short Term Attachments on Farms**: Lecturers can arrange one day or one week work sessions on farm enterprises for the students to get a feel of how the enterprises work. The students will not just learn how the farms work but they will do the work themselves.

• **Recorded Videos and Films**: Lectures can also explore the use of alternatives to field practicals. The use of recorded media is an effective way of demonstrating how farm enterprises work without physically visiting the farms. There are many organisations that provide videos and short films on how to farm or carry out activities on the farms. For example websites such as SA Orchard (saorchard.co.za/) have training videos for the Deciduous Fruit Farming community. The videos are freely available and they are also available in Afrikaans and Xhosa languages. This is just one example, other materials maybe available, the lecturer should explore relevant websites.

Lecturers should note that these are just a few suggestions. The lecturer is encouraged to set up what is best for his students based on the environment and resources available.

**Assumptions about Prior Knowledge and Skills**

Recognition of Prior Learning (RPL) is possible through the assessment of individual themes. The learner and assessor should jointly decide on methods to determine prior learning and competence in the knowledge, skills, and values implicit in the qualification and the associated themes. RPL will be done by means of an integrated assessment which includes formal, informal and non-formal learning and work experience. This Recognition of Prior Learning may allow for accelerated access to further learning at this or higher Levels on the NQF; gaining of credits for themes in this qualification; and obtaining this qualification in whole or in part.
THEME 1: AGRICULTURE AS AN APPLIED SCIENCE

Introduction
This theme provides an overview of agriculture as a challenging and applied system. After completing this theme, students should be able to understand the nature of agriculture as an applied science, differentiate between the various agricultural disciplines and their linkages, and apply knowledge acquired in assisting subsistence and commercial farmers.

Rationale for Content Selection
The content was selected to provide a complete overview of agriculture, including the various disciplines. The content also gives a brief overview of challenges of agriculture in developing countries to give the student an appreciation of global agriculture.

Content Structure

<table>
<thead>
<tr>
<th>Topic Heading</th>
<th>Topic (with Approximate Instructional Time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nature of agriculture</td>
<td>1.1. Definition of agriculture (1 hour)</td>
</tr>
<tr>
<td></td>
<td>1.2. Agriculture as an applied science (1 hour)</td>
</tr>
<tr>
<td></td>
<td>1.3. Relationship between agriculture and other natural sciences (1 hour)</td>
</tr>
<tr>
<td>2. Various agricultural disciplines</td>
<td>2.1. Various agricultural disciplines and their relationships (1 hour)</td>
</tr>
<tr>
<td>3. Geographical distribution of Agriculture and its socio-economic impact</td>
<td>3.1. The significance of agriculture in society (2 hours)</td>
</tr>
<tr>
<td></td>
<td>3.2. Economic importance of agriculture (2 hours)</td>
</tr>
<tr>
<td></td>
<td>3.3. Socio-economic impact of agriculture (2 hours)</td>
</tr>
<tr>
<td>4. Agricultural Technology</td>
<td>4.1. Agricultural technology and its link to applied agriculture (2 hours)</td>
</tr>
<tr>
<td></td>
<td>4.2. Principles of appropriate technology (2 hours)</td>
</tr>
<tr>
<td></td>
<td>4.3. Applications of agricultural technology (2 hours)</td>
</tr>
<tr>
<td>5. Opportunities and challenges of Agriculture in developing countries</td>
<td>5.1. Opportunities of agriculture in developing countries (2 hours)</td>
</tr>
<tr>
<td></td>
<td>5.2. Challenges of agriculture in developing countries (2 hours)</td>
</tr>
<tr>
<td></td>
<td>5.3. Role of agriculture in food security (3 hours)</td>
</tr>
<tr>
<td></td>
<td>5.4. Significance of commercial agriculture for economic and social development (5 hours)</td>
</tr>
<tr>
<td></td>
<td>5.5. Career opportunities in agriculture (2 hours)</td>
</tr>
</tbody>
</table>
Section 1. Nature of Agriculture

Overview

This section introduces students to the nature of the agricultural field as an applied science. The definition of agriculture as an art, science and business is explained as well as the history and evolution of agriculture. This is followed by a description of the relationship between agriculture, farming and other natural sciences. The significance of the relationship between agriculture and other natural sciences is then discussed.

1.1. Definition of agriculture

Content:
- Definition of agriculture;
- Relationship between agriculture and farming;
- Agriculture as an art, science and business

Learning Outcomes:
Students should be able to:
- 1.1.1. Define agriculture;
- 1.1.2. Understand the relationship between agriculture and farming;
- 1.1.3. Describe agriculture as an art, science and business

1.2. Agriculture as an applied science

Content:
- Nature of agriculture;
- Various agricultural disciplines;
- Relationship between agriculture and other natural sciences

Learning Outcomes:
Students should be able to:
- 1.2.1. Describe agriculture as an applied science;
- 1.2.2. Identify various agricultural disciplines and describe how they are linked;
- 1.2.3. Establish and discuss the relationship between agriculture and other natural sciences

Section 2. Agricultural disciplines

Overview

This section covers the various disciplines of agriculture. The disciplines covered are agronomy (field crops and soil science), livestock science, horticultural science, agricultural economics and extension as well as agricultural engineering.
2.1. **Agronomy**
   **Content:**
   - Definition of agronomy;
   - Importance of agronomy;
   - Basic principles of agronomy;
   - Role of an agronomist

   **Learning Outcomes:**
   Students should be able to:
   2.1.1. Define agronomy;
   2.1.2. State the branches of agronomy;
   2.1.3. Understand the importance of agronomy;
   2.1.4. Outline the basic principles of agronomy;
   2.1.5. Understand the roles of an agronomist

2.2. **Animal Science**
   **Content:**
   - Definition of animal science;
   - Branches of animal science;
   - Roles of an animal scientist

   **Learning Outcomes:**
   Students should be able to:
   2.2.1. Define animal science;
   2.2.2. State the branches of animal science;
   2.2.3. Understand the roles of an animal scientist

2.3. **Horticultural Science**
   **Content:**
   - Definition of horticulture;
   - Difference between horticulture and agronomy;
   - Principles of horticulture;
   - Branches of horticulture;
   - Roles of a horticulturist

   **Learning Outcomes:**
   Students should be able to:
   2.3.1. Define horticulture;
   2.3.2. Distinguish between horticulture and agronomy;
   2.3.3. Outline the principles of horticulture;
   2.3.4. List the branches of horticulture;
   2.3.5. Understand the roles of a horticulturist
2.4. Agricultural economics and extension

Content:
- Definition of agricultural economics;
- Difference between agricultural economics and agricultural extension;
- Branches of agricultural economics;
- Principles of agricultural economics;
- Roles of an agricultural economist

Learning Outcomes:
Students should be able to:
2.4.1. Define agricultural economics
2.4.2. Define agricultural extension
2.4.3. List the branches of agricultural economics;
2.4.4. Understand the principles of agricultural economics;
2.4.5. Understand the role of an agricultural economist

Section 3. Geographical distribution of Agriculture and its socio-economic impact

Overview
This section covers the geographical distribution of agriculture in South Africa. The distribution of the different agricultural enterprises across provinces is covered. The economic importance of agriculture is discussed as well as the socio-economic impact

3.1. Geographical distribution of agriculture

Content:
- Role of agriculture in the South African economy;
- Distribution of different agricultural activities/enterprises across the country;
- Relationship between agriculture and other economic activities

Learning Outcomes:
Students should be able to:
3.1.1. Discuss the role and significance of agriculture in the South African economy
3.1.2. Discuss the distribution of agricultural activities/enterprises across the country;
3.1.3. Explain the relationship between agriculture and other economic activities
3.2. **Economic importance of agriculture**  
**Content:**  
- Source of livelihood;  
- Contribution to national revenue and significance to international trade;  
- Supply of food as well as fodder;  
- Contribution of agriculture towards job creation;  
- Source of raw material  

**Learning Outcomes:**  
Students should be able to:  
3.2.1. Understand the economic importance of agriculture in the South African economy;  
3.2.2. Understand the role of agriculture in job creation;  
3.2.3. Understand the role of agriculture in food and fodder production and as a source of raw materials;  
3.2.4. Discuss the role of agricultural trade on revenue generation  

3.3. **Socio-economic impact of agriculture**  
**Content:**  
- Employment opportunities;  
- Contribution to economic development;  
- Role of agriculture in poverty alleviation;  
- Impact of agriculture on rural livelihoods;  
- Impact of agriculture on food prices  

**Learning Outcomes:**  
Students should be able to:  
3.3.1. Understand employment opportunities in agriculture;  
3.3.2. Discuss the role of agriculture as a poverty alleviation strategy;  
3.3.3. Discuss the impact of agriculture on rural livelihoods;  
3.3.4. Understand the impact of agriculture on rural and urban food security and nutrition;  
3.3.5. Understand the impact of agriculture on food prices  

**Section 4. Role of Agricultural technology in applied agriculture**  
**Overview**  
This section deals with the role of agricultural technology in applied agriculture and agricultural science. It covers the principles of agricultural technology as well as the application of appropriate technology.  

4.1. **Description of agricultural technology**  
**Content:**  
- Definition of agricultural technology;
• Technology generation and transfer;
• Role of policy in technology adoption

Learning Outcomes:
Students should be able to:
4.1.1. Define agricultural technology;
4.1.2. Understand how technologies are generated and the effectiveness of technology transfer;
4.1.3. Understand the role of policy in technology adoption

4.2. Principles of appropriate technology
Content:
• What is appropriate technology?
• Characteristics of inappropriate technology;
• Principles of appropriate technology

Learning Outcomes:
Students should be able to:
4.2.1. Define appropriate technology;
4.2.2. List the characteristics of inappropriate technology;
4.2.3. Outline the principles of appropriate technology

4.3. Application of appropriate technology
Content:
• Tools and methods;
• Case studies

Learning Outcomes:
Students should be able to:
4.3.1. Understand tools and methods of applying appropriate technology;
4.3.2. Identify appropriate and inappropriate technology from case studies

Section 5. Opportunities and challenges of agriculture in the developing world
Overview
This section deals with the opportunities and challenges faced by developing countries in agricultural development. It covers the role of agriculture in food security and the significance of commercial agriculture in economic and social development

5.1. Role of agriculture in food security
Content:
• Definition of food security;
• Difference between household and national food security;
• The state of food security in South Africa;
• Role of agriculture in food security

Learning Outcomes:
Students should be able to:
5.1.1. Define food security;
5.1.2. Distinguish between household and national food security;
5.1.3. Discuss the current state of food security in South Africa;
5.1.4. Discuss the role of agriculture in food security

5.2. Significance of commercial agriculture for economic and social development

Content:
• Definition of commercial agriculture;
• Difference between commercial and subsistence agriculture;
• Description of the commercial agriculture sector in South Africa;
• Significance of commercial agriculture for economic and social development

Learning Outcomes:
Students should be able to:
5.2.1. Define commercial agriculture;
5.2.2. Distinguish between commercial and subsistence agriculture;
5.2.3. Describe the nature of the commercial agricultural sector in South Africa;
5.2.4. Understand the significance of commercial agriculture for economic and social development
THEME 2: SUSTAINABLE CROP PRODUCTION

Introduction

The purpose of this theme is to introduce students to basic principles of crop production. Students are introduced to soil, water and climate as factors affecting crop production. Principles of crop protection are covered with special focus on the three major groups of agricultural pests namely pathogens (microorganisms which cause diseases), animal pests (e.g. insects and mites) and weeds (plant pests), and their management and control. The effects of different cultivation practices on sustainability of crop production are covered, followed by a description of sustainable agricultural production practices.

Rationale for Content Selection

The content is selected to cover a whole range of crop production related issues, from methods of production, to the factors that affect production, pest management as well as sustainable crop production. The course allows the student to see beyond crop production but also allows the student to understand the connection between crops and the environment in which they grow.

Content Structure

<table>
<thead>
<tr>
<th>Topic Heading</th>
<th>Topic (with Approximate Instructional Time)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6.2. Soil texture and structure (6 hours)</td>
</tr>
<tr>
<td></td>
<td>6.3. Soil classification (5 hours)</td>
</tr>
<tr>
<td></td>
<td>6.4. Soil as a crop production factor (2 hours)</td>
</tr>
<tr>
<td></td>
<td>6.5. Factors affecting soil productivity (4 hours)</td>
</tr>
<tr>
<td>7. Climatic factors affecting crop production</td>
<td>7.1. Role of rainfall in crop production (4 hours)</td>
</tr>
<tr>
<td></td>
<td>7.2. Role of temperature in crop production (4 hours)</td>
</tr>
<tr>
<td></td>
<td>7.3. Classification of crops according to temperature requirements (7 hours)</td>
</tr>
<tr>
<td>8. Role and importance of water in crop production</td>
<td>8.1. Sources, quality and quantity of water (5 hours)</td>
</tr>
<tr>
<td></td>
<td>8.2. Role of water in crop production (5 hours)</td>
</tr>
<tr>
<td></td>
<td>8.3. Water conservation in crop production (5 hours)</td>
</tr>
<tr>
<td>9. Pest management in crop production</td>
<td>9.1. Major groups of agricultural pests (6 hours)</td>
</tr>
<tr>
<td></td>
<td>9.2. Harmful effects of major agricultural crops (6 hours)</td>
</tr>
<tr>
<td></td>
<td>9.3. Methods of pest control (6 hours)</td>
</tr>
<tr>
<td></td>
<td>9.4. Integrated pest management (6 hours)</td>
</tr>
<tr>
<td>10. Sustainable crop production practices</td>
<td>10.1. The concept of sustainability (5 hours)</td>
</tr>
<tr>
<td></td>
<td>10.2. Impact of different crop production practices on sustainability of crop production (5 hours)</td>
</tr>
<tr>
<td></td>
<td>10.3. Sustainable crop production practices (5 hours)</td>
</tr>
</tbody>
</table>
Section 6. Nature and role of soil in crop production

Overview

This section deals with the nature of soil as well as the role of soil as a crop production factor. Covered in this section are the definition and description of soil, the importance of soil, soil-forming factors and processes, soil texture and structure, and soil as a crop production factor and the factors affecting soil productivity.

6.1. Definition and description of soil

Content:
- What is soil?
- Why is soil important;
- Soil forming factors;
- Soil forming processes

Learning Outcomes:

Students should be able to:
6.1.1. Define the term soil;
6.1.2. Understand why soil is important;
6.1.3. Understand the soil forming factors and processes;
6.1.4. Describe soil as a component of the environment

6.2. Soil texture

Content:
- Definition of soil texture;
- Soil classification according to texture;
- Importance of soil texture

Learning Outcomes:

Students should be able to:
6.2.1. Define soil texture;
6.2.2. Discuss textural soil classification;
6.2.3. Discuss the importance of soil texture;
6.2.4. difference between soil texture and soil structure;

6.3. Soil structure

Content:
- Definition of soil structure
- Soil structural units;
- Types of soil structure;
- Formation of soil structure;
- Importance of soil structure
Learning Outcomes:
Students should be able to:

6.3.1. Define soil structure;
6.3.2. Describe the soil structural units;
6.3.3. Understand the types of soil structure;
6.3.4. Understand the importance of soil structure

6.4. Other soil physical properties
Content:
- Infiltration and permeability;
- Soil compaction;
- Soil temperature

Learning Outcomes:
Students should be able to:

6.4.1. Contrast between infiltration and permeability;
6.4.2. Describe the factors influencing infiltration rate;
6.4.3. Define and explain soil compaction;
6.4.4. Define soil temperature;
6.4.5. Outline the importance of soil temperature in crop production

6.5. Soil biological properties
Content:
- Effect of micro and macro-organisms on soil properties;
- Factors affecting abundance of organisms in the soil;
- What is soil organic matter?
- Factors affecting soil organic matter;
- Benefits of stable soil organic matter

Learning Outcomes:
Students should be able to:

6.5.1. Discuss the effect of micro and macro-organisms on soil properties;
6.5.2. Discuss the factors affecting abundance of organisms in the soil;
6.5.3. Define soil organic matter;
6.5.4. Discuss the factors affecting soil organic matter;
6.5.5. Outline the benefits of stable soil organic matter

Section 7. Climatic factors affecting crop production
Overview
This section focusses on the major climatic factors affecting crop production. Rainfall and temperature are discussed as the major climatic factors affecting crop production. Classification of crops according to water and temperature requirements is also covered.
7.1. Precipitation

Content:
- Difference between rainfall and precipitation;
- Rainfall amounts and patterns across South Africa;
- Relationship between total rainfall and rainfall distribution;
- Summer and winter rainfall and implication on crop production;
- Effect of climate change on rainfall patterns in South Africa

Learning Outcomes:
Students should be able to:
7.1.1. Distinguish between rainfall and precipitation;
7.1.2. Discuss the classification of South Africa into different regions based on rainfall amounts and distribution;
7.1.3. Explain why rainfall distribution is more important than total rainfall in crop production;
7.1.4. Contrast summer and winter crop production;
7.1.5. Discuss the effect of climate change on rainfall patterns;
7.1.6. Discuss the role of rainfall in crop production and the impact of crop productivity

7.2. Temperature

Content:
- Effect of temperature on distribution of plants;
- Effect of temperature on plant growth and development;
- Classification of crops based on temperature requirements

Learning Outcomes:
Students should be able to:
7.2.1. Discuss the effect of temperature on the distribution of plants;
7.2.2. Discuss the effect of temperature on plant growth and development;
7.2.3. Classify crops according to temperature requirements;
7.2.4. Understand the role of temperature in crop production

7.3. Solar radiation (sunlight)

Content:
- Light intensity (quantity) and light quality;
- Factors affecting light intensity;
- Role of light in photosynthesis;
- Effect of light intensity on plant growth

Learning Outcomes:
Students should be able to:
7.3.1. Distinguish between light intensity and light quality;
7.3.2. Discuss the factors affecting light intensity;
7.3.3. Describe the role of light in photosynthesis;
7.3.4. Explain the effect of light intensity on plant growth

7.4. Relative humidity

Content:
- Definition of relative humidity;
- Effects of relative humidity on photosynthesis
- Effect of relative humidity on plant disease development

Learning Outcomes:
Students should be able to:
7.4.1. Define relative humidity;
7.4.2. Describe the effects of relative humidity on photosynthesis;
7.4.3. Describe the effect of relative humidity on development of plant disease

7.5. Wind as a climatic factor

Content:
- Effects of wind in crop production;
- Wind erosion

Learning Outcomes:
Students should be able to:
7.5.1. Discuss the effects of wind in crop production;
7.5.2. Discuss wind erosion as a factor affecting crop production

Section 8. Role and importance of water in crop production

Overview
This section deals with the role and importance of water in crop production. It covers the different sources of water and provides a distinction between quality and quantity of water. Water conservation strategies are then discussed in detail.

8.1. Sources, quality and quantity of water

Content:
- Groundwater and surface water;
- Rainfall and irrigation water;
- Role of irrigation in crop production;
- Salinity problems
Learning Outcomes:
Students should be able to:

8.1.1. Distinguish between groundwater and surface water;
8.1.2. Distinguish between rainfall and irrigation water;
8.1.3. Discuss the role of irrigation in crop production;
8.1.4. Explain the salinity problems associated with irrigation

8.2. Role of water in crop production
Content:
- Dryland/rainfed crop production
- Crop production under irrigation

Learning Outcomes:
Students should be able to:

8.2.1. Differentiate between dryland and irrigated crop production
8.2.2. Discuss the advantages associated with irrigated crop production
8.2.3. Explain the differences in crop management practices under irrigation and dryland crop production

8.3. Water conservation in crop production
Content:
- Rainwater harvesting and storage;
- Drought tolerant crops;
- Cover crops;
- Water conservation strategies in crop production

Learning Outcomes:
Students should be able to:

8.3.1. Define rainwater harvesting;
8.3.2. Discuss the role of drought tolerant crops and cover crops in water conservation
8.3.3. Discuss the various water conservation strategies in crop production.

Section 9. Pest management in crop production

Overview
This section deals with principles of crop protection. The word pest is defined, followed by a description of the major groups of agricultural pests. The beneficial effects of insects and weeds are discussed, followed by a discussion on the harmful effects of pests in crop production. A comprehensive discussion of the different methods of pest control is followed by a description of integrated pest management.

9.1. Major groups of agricultural pests
Content:
- What is a pest?
Learning Outcomes:
Students should be able to:
9.1.1. Define the word “pest”
9.1.2. Differentiate between pathogen and disease;
9.1.3. List the major groups of agricultural pests and give examples of pests in each grow

9.2. Effects of pests on crop production

Content:
- Beneficial effects of insects;
- Beneficial effects of weeds;
- Harmful effects of agricultural pests on crop production

Learning Outcomes:
Students should be able to:
9.2.1. Outline the beneficial effects of insects;
9.2.2. Outline the beneficial effects of weeds;
9.2.3. Discuss the harmful effects of insects, disease-causing organisms (pathogens) and weeds on crop production

9.3. Methods of pest control

Content:
- Filed scouting and monitoring of pests;
- Cultural control practices;
- Biological control;
- Chemical control practices

Learning Outcomes:
Students should be able to:
9.3.1. Discuss the different methods of pest control;
9.3.2. Define and give examples of natural enemies;
9.3.3. Define cultural control;
9.3.4. Give examples of cultural control tactics;
9.3.5. Give advantages and disadvantages associated with cultural pest control;
9.3.6. List the name of chemicals used to control pathogens, insects and weeds;
9.3.7. Discuss the advantages and disadvantages associated with chemical pest control
9.4. Integrated pest management

Content:
- Definition of integrated pest management;
- Importance of pre-harvest interval, residues, re-entry interval and phytotoxicity;
- Pesticide resistance

Learning Outcomes:
Students should be able to:
9.4.1. Define integrated pest management;
9.4.2. Define pre-harvest interval, residues, re-entry interval and phytotoxicity;
9.4.3. Discuss the advantages associated with IPM;
9.4.4. Explain how IPM helps to delay development of pesticide resistance

Section 10. Sustainable crop production practices

Overview
This section deals with sustainability in crop production. The concept of sustainability is defined, followed by a discussion of the impact of different crop production practices on sustainability. The section wraps up with a comprehensive discussion of sustainable crop production practices

10.1. The concept of sustainability

Content:
- Definition of sustainability;
- What is sustainable agriculture?
- Agronomic, environmental, economic and social sustainability

Learning Outcomes:
Students should be able to:
10.1.1. Understand the concept of sustainability;
10.1.2. Define sustainable agriculture;
10.1.3. Explain agronomic sustainability;
10.1.4. Explain environmental sustainability;
10.1.5. Explain economic sustainability;
10.1.6. Explain social sustainability

10.2. Unsustainable crop production practices

Content:
- Monoculture;
- Conventional tillage;
- Reliance on chemical pest control;
Learning Outcomes:
Students should be able to:
10.2.1. Define monoculture and explain why it is unsustainable;
10.2.2. Distinguish between conventional and conservation tillage;
10.2.3. Describe the disadvantages of conventional tillage;
10.2.4. Describe the disadvantages of relying on chemicals for pest control;
10.2.5. List other examples of unsustainable agricultural practices and give reasons why such practices are not sustainable

10.3. Impact of different agricultural practices on sustainability
Content:
• Impact on agronomic sustainability;
• Impact on environmental sustainability;
• Impact on economic sustainability

Learning Outcomes:
Students should be able to:
10.3.1. Understand the impact of various crop production practices on agronomic, environmental and economic sustainability

10.4. Sustainable crop production practices
Content:
• Cover crops and crop residue management;
• Conservation agriculture;
• Organic agriculture;
• Integrated pest management

Learning Outcomes:
Students should be able to:
10.4.1. Define cover crops and explain the importance of crop residue management;
10.4.2. Outline the principles of conservation agriculture;
10.4.3. Discuss the benefits of conservation agriculture;
10.4.4. Define organic agriculture and discuss its benefits;
10.4.5. Explain why integrated pest management is sustainable
THEME 3: SUSTAINABLE LIVESTOCK PRODUCTION

Introduction

The purpose of this theme is to provide an assessment of the influence of the environment on sustainable livestock production. Upon completion of this theme, students should be able to:

- explain the influence of the environment on the veld;
- understand the influence of veld composition on livestock feeding preferences and habits;
- demonstrate understanding of the influence of the environment on livestock selection;
- apply appropriate supplementary feeding methods for livestock production; and
- demonstrate understanding on principles of veld management and how they impact on agricultural sustainability.

Rationale for Content Selection

The content of the sustainable livestock production component focuses on the influence of the environment on livestock production. The focus is on sustainable production because of the current pressures due to climate change and drought, therefore students need to be well informed about how to manage the veld to minimise the impacts of these threats on livestock production. The main objective of the content is therefore to make the student aware of livestock production practices and the environmental factors that contribute to successful livestock production.
## Section 11. Environmental factors influencing the veld

### Overview

This section provides an overview of the environmental factors influencing the veld. The different types of veld are also discussed.

### 11.1. Types of veld

**Content:**
- Sweetveld;
- Sourveld;
- Mixed veld

**Learning Outcomes:**

Students should be able to:

11.1.1. List the main types of veld;
11.1.2. Explain the differences between the different types of veld;
11.1.3. Describe different veld preferences by different livestock;

---

<table>
<thead>
<tr>
<th>Topic Heading</th>
<th>Topic (with Approximate Instructional Time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>11. Environmental factors</td>
<td>11.1. Types of veld (1 hour)</td>
</tr>
<tr>
<td>influencing the veld</td>
<td>11.2. Ecological factors affecting the veld (4 hours)</td>
</tr>
<tr>
<td>12. Influence of veld</td>
<td>12.1. Composition of the veld (2 hours)</td>
</tr>
<tr>
<td>composition on livestock</td>
<td>12.2. Types of feeding habits of livestock (6 hours)</td>
</tr>
<tr>
<td>feeding habits</td>
<td>12.3. Selective grazing (2 hours)</td>
</tr>
<tr>
<td>13. Environmental factors</td>
<td>13.1. The environment as a factor influencing livestock selection (5 hours)</td>
</tr>
<tr>
<td>influencing livestock</td>
<td>13.2. Livestock breeds and their needs (5 hours)</td>
</tr>
<tr>
<td>selection</td>
<td>13.3. Livestock breeding areas (5 hours)</td>
</tr>
<tr>
<td>14. Supplementary feeding</td>
<td>14.1. Methods of supplementary feeding (5 hours)</td>
</tr>
<tr>
<td>options for livestock</td>
<td>14.2. Types of cultivated pastures (5 hours)</td>
</tr>
<tr>
<td>production</td>
<td>14.3. Grazing control practices on cultivated pastures (5 hours)</td>
</tr>
<tr>
<td>15. Beneficial and harmful</td>
<td>15.1. Beneficial and harmful organisms in livestock production (4 hours)</td>
</tr>
<tr>
<td>organisms influencing</td>
<td>15.2. Internal and external parasites (4 hours)</td>
</tr>
<tr>
<td>livestock production</td>
<td>15.3. Poisonous plants which affect livestock products (4 hours)</td>
</tr>
<tr>
<td>management practices</td>
<td>16.2. Sustainable veld management strategies (2 hours)</td>
</tr>
<tr>
<td>on sustainability of</td>
<td>16.3. Influence of livestock management practices on agricultural sustainability (2 hours)</td>
</tr>
<tr>
<td>livestock production</td>
<td></td>
</tr>
</tbody>
</table>
11.1.4. Discuss the environmental factors influencing the veld

11.2. Factors affecting the veld

Content:
- Climate;
- Soil;
- Topography

Learning Outcomes:
Students should be able to:
11.2.1. Explain the influence of climate, soil and topography on the veld

Section 12. Influence of veld composition on livestock feeding habits

Overview
In this section, the composition of the veld is described and the different types of feeding habits of animals and explained. The concept of selective grazing is discussed as one of the feeding preferences and needs by animals.

12.1. Composition of the veld

Content:
- Definition of veld composition;
- Importance of veld composition in veld management;
- Pioneer and climax species;
- Role of pioneer and climax species on veld management

Learning Outcomes:
Students should be able to:
12.1.1. Define veld composition;
12.1.2. Explain the importance of veld composition in veld management;
12.1.3. Differentiate between pioneer and climax species;
12.1.4. Explain the role of pioneer and climax species on veld management

12.2. Types of feeding habits of livestock

Content:
- Browsers;
- Grazers

Learning Outcomes:
Students should be able to:
12.2.1. Distinguish between browsers and grazers;
12.2.2. Give examples of browsers and grazers

12.3. Selective grazing

Content:
- Description of selective grazing

Learning Outcomes:
Students should be able to:
12.3.1. Define and describe selective grazing

Section 13. Environmental factors influencing livestock selection

Overview
This section provides an analysis and description of the environmental factors that influence livestock selection. Content covered include the importance of the environment as a factor influencing livestock selection, livestock breeds and their needs, livestock breeding areas and management of the environmental factors for sustainable livestock production.

13.1. The environment as a factor influencing livestock selection

Content:
- Influence of weather conditions (heat, cold, wet or dry); Influence of rainfall on livestock selection;
- Influence of soil type of livestock selection;
- Animal health as a factor

Learning Outcomes:
Students should be able to:
13.1.1. Explain the impact of weather conditions on livestock selection, including the impact of rainfall;
13.1.2. Describe how soil type affects livestock selection
13.1.3. Explain how animal health influences livestock selection

13.2. Livestock breeds and their needs

Content:
- Indigenous breeds of livestock;
- Locally developed breeds of livestock;
- Imported livestock breeds;
- Exported livestock breeds

Learning Outcomes:
Students should be able to:
13.2.1. List and describe examples of indigenous and locally developed livestock breeds;
13.2.2. List and describe imported livestock breeds
13.2.3. List and describe livestock breeds that have been exported by South Africa

13.3. Livestock breeding regions
   **Content:**
   - Local;
   - Provincial;
   - National;

   **Learning Outcomes:**
   Students should be able to:
   13.3.1. Discuss the different livestock breeding regions

Section 14. Supplementary feeding options for livestock production

**Overview**
This section covers methods of supplementary feeding as well as methods of producing supplementary feed, such as legume and grass pastures as well as drought tolerant fodder.

14.1. Methods of supplementary feeding
   **Content:**
   - Green and dry fodder;
   - Silage;
   - Forage;
   - Concentrate

   **Learning Outcomes:**
   Students should be able to:
   14.1.1. Discuss the different methods of supplementary feeding

14.2. Types of cultivated pastures
   **Content:**
   - Legume pastures;
   - Grass pastures;
   - Drought-tolerant fodder crops
Learning Outcomes:
Students should be able to:
14.2.1. Describe different types of legume pastures found in South Africa;
14.2.2. Describe different types of grass pastures in South Africa;
14.2.3. Describe different types of drought tolerant fodder crops

14.3. Constraints to pasture and fodder production
Content:
• Local;
• Provincial;
• National;

Learning Outcomes:
Students should be able to:
14.3.1. Describe factors limiting pasture and fodder production at local level;
14.3.2. Describe factors limiting fodder production at provincial level;
14.3.3. Describe national constraints to fodder and pasture production

14.4. Licks as dietary supplements
Content:
• Different types of licks;
• Different ways of using licks

Learning Outcomes:
Students should be able to:
14.4.1. Describe the different types of licks for dietary supplements;
14.4.2. Describe the use of licks during different times of the year

Section 15. Beneficial and harmful organisms that influence livestock production
Overview
The section covers different types of organisms and their effect on livestock production. Both harmful and beneficial organisms are discussed.

15.1. Beneficial and harmful organisms
Content:
• Beneficial organisms;
• Parasites

Learning Outcomes:
Students should be able to:
15.1.1. List examples of beneficial organisms in livestock production;
15.1.2. Discuss the beneficial organisms in livestock production;
15.1.3. Define parasites

15.2. Internal and external parasites

Content:
- Types of internal and external parasites;
- Effects of internal and external parasites;
- Control of internal and external parasites

Learning Outcomes:
Students should be able to:
15.2.1. List the different types of internal and external parasites;
15.2.2. Describe the effects of internal and external parasites;
15.2.3. Describe the methods of controlling internal and external parasites

15.3. Poisonous plants that affect livestock production

Content:
- Toxic plants of South Africa;
- Toxic plants and their effects on cattle;
- Toxic plants and their effects of sheep and goats;
- Prevention of plant poisoning

Learning Outcomes:
Students should be able to:
15.3.1. List different types of toxic plants found in South Africa;
15.3.2. Describe toxic plants and their effects of cattle;
15.3.3. Describe toxic plants and their effects on sheep and goats
15.3.4. Explain how to prevent plant poisoning in livestock

15.4. Important livestock diseases

Content:
- Animal health, internal and external parasites;
- Animal health and diseases (including diseases caused by bacteria, fungi, viruses, protozoa and the environment);
- Animal health and beneficial organisms;

Learning Outcomes:
Students should be able to:
15.4.1. Describe animal health in relation to internal and external parasites
15.4.2. Describe animal health in relation to diseases caused by bacteria, fungi, viruses, protozoa and the environment;
15.4.3. Describe some of the organisms that are beneficial to livestock
THEME 4: AGRICULTURAL PRODUCTION MANAGEMENT PRACTICES IN RELATION TO SOCIO-ECONOMIC ENVIRONMENT

Introduction

The aim of this theme is to enable students to demonstrate an understanding of agricultural production management practices in relation to the socio-economic environment. After completing this theme, students should be able to explain and apply ethical business principles to an agricultural enterprise; explain the influence of supply and demand on agricultural production; distinguish between different land ownership and tenure systems; discuss the relationship between entrepreneurship and agricultural ventures; and explain the role and importance of human resources in agricultural production.

Rationale for Content Selection

The theme of agricultural production management practices focuses on the understanding of basic principles of agricultural management. The aim is to give the students a basic understanding of managing agricultural projects as businesses. The section therefore covers basic areas of agricultural economics and such as gross margin, budgets, supply and demand. Land tenure is also a very important area; therefore students are introduced to basic principles. The linkage between agriculture and entrepreneurship is also covered. Human resources and labour practice are also introduced, so that the students can have a balanced view of agriculture as a business, including the labour force.

Content Structure

<table>
<thead>
<tr>
<th>Topic Heading</th>
<th>Topic (with Approximate Instructional Time)</th>
</tr>
</thead>
</table>
16.2. Enterprise budgets (6 hours)  
16.3. Business principles (6 hours) |
| 17. Agricultural production practices in a changing business environment | 17.1. Supply and demand (4 hours)  
17.2. Impact of supply and demand in agricultural production (6 hours) |
| 18. Land ownership and tenure systems | 18.1. What is land tenure? (7 hours)  
18.2. Types of tenure systems (10 hours)  
18.3. Impact of different tenure systems on production (8 hours) |
| 19. Relationship between entrepreneurship and agricultural ventures | 19.1. Entrepreneurship (10 hours)  
19.2. Link between entrepreneurship and agricultural venture (5 hours)  
19.3. Case studies on entrepreneurship (5 hours) |
| 20. Human resources management in agriculture | 20.1. Categories of human resources in agricultural ventures (5 hours)  
20.2. Characteristics of the different categories of human resources (5 hours)  
20.3. Roles of different agricultural human resources (5 hours)  
20.4. Principles of basic labour relations prescripts (5 hours) |
Section 16. Ethical agricultural business principles

Overview

This section deals with the application of ethical business principles to an agricultural enterprise or venture. Case studies are used to identify and apply business principles related to an agricultural venture. Concepts of gross margin and enterprise budgeting are explained in detail.

16.1. Gross margin

Content:

- Meaning of gross margin;
- Calculation of gross margin

Learning Outcomes:

Students should be able to:
16.1.1. Define gross margin;
16.1.2. Calculate gross margin for different agricultural enterprises

16.2. Enterprise budgeting

Content:

- Definition of an enterprise budget;
- Use and examples of enterprise budgets

Learning Outcomes:

Students should be able to:
16.2.1. Define an enterprise budget;
16.2.2. Understand the importance of enterprise budgets;
16.2.3. Interpret enterprise budgets and make economic decisions

16.3. Ethical business principles

Content:

- Definition of business ethics;
- The ethical principles for business

Learning Outcomes:

Students should be able to:
16.3.1. Define business ethics;
16.3.2. List the ethical principles for business;
16.3.3. Apply the different principles of business ethics
Section 17. Agricultural production practices in a changing business environment

Overview

This section deals with modification of agricultural practices to a changing business environment. The concepts of supply and demand are explained using real life agricultural examples. Also covered is an analysis of the impact of supply and demand in agricultural production.

17.1. Supply and demand

Content:

- Definitions of supply and demand;
- The law of supply and the law of demand
- Time and supply
- Supply and demand relationship
- Equilibrium and disequilibrium;
- Supply and demand curves

Learning Outcomes:

Students should be able to:

17.1.1. Define supply and demand;
17.1.2. Explain the laws of demand and supply;
17.1.3. Explain the time factor in supply;
17.1.4. Explain the supply and demand relationship on price of agricultural commodities;
17.1.5. Distinguish between and explain the concepts of equilibrium and disequilibrium
17.1.6. Interpret supply and demand curves

17.2. Impact of supply and demand in agricultural production

Content:

- Factors affecting demand;
- Factors affecting supply
- Impact of supply and demand on agricultural production

Learning Outcomes:

Students should be able to:

17.2.1. Discuss the factors affecting demand;
17.2.2. Discuss factors affecting supply;
17.2.3. Discuss the impact of supply and demand on agricultural production;
Section 18. Land ownership and tenure systems

Overview

This section gives an insight into the different land ownership and tenure systems and their impact on agricultural productivity. To do this, the concepts of land tenure systems and ownership are explained. This is followed by analysis of the different tenure systems and a suggestion of possible management options for different land tenure systems.

18.1. What is land tenure

Content:
- Definition of land tenure;
- Importance of land tenure;
- Property rights

Learning Outcomes:
Students should be able to:
18.1.1. Define land tenure;
18.1.2. Understand property rights

18.2. Types of tenure systems

Content:
- Categories of land tenure;
- Land administration

Learning Outcomes:
Students should be able to:
18.2.1. List the different categories of land tenure;
18.2.2. Understand land administration

18.3. Impact of different tenure systems on production

Content:
- Access to land;
- Length of tenure
- Tenure security

Learning Outcomes:
Students should be able to:
18.3.1. Understand the effect of different tenure systems on access to land;
18.3.2. Understand the importance of length of tenure;
18.3.3. Define tenure security;
18.3.4. Understand importance of tenure security in agricultural production
Section 19. Relationship between entrepreneurship and agricultural ventures

Overview

This section deals with entrepreneurial principles applicable to agricultural ventures. After completing the section, students are expected to demonstrate an understanding of entrepreneurial principles applicable to agricultural ventures. The concept of entrepreneurship is explained and the relationship between entrepreneurship and agricultural ventures is expounded using case studies.

19.1. Entrepreneurship

Content:
- Meaning of entrepreneurship;
- Importance of entrepreneurship for the economy

Learning Outcomes:
Students should be able to:
19.1.1. Define entrepreneurship;
19.1.2. Understand the importance of agricultural entrepreneurship to the economy

19.2. Link between entrepreneurship and agricultural venture

Content:
- Differences between small business and entrepreneurial ventures;
- Entrepreneurial case studies

Learning Outcomes:
Students should be able to:
19.2.1. Distinguish between small business and entrepreneurial ventures
19.2.2. Demonstrate understanding of entrepreneurial principles using case studies

Section 20. Human resources management in agriculture

Overview

This section describes the role of human resources in agricultural enterprises, including categories of human, labour relations and the role of trade unions.

20.1. Categories of human resources in agricultural ventures

Content:
- Definition of human resources;
- Major categories of human resources;
Learning Outcomes:
Students should be able to:
20.1.1. Define human resources;
20.1.2. Outline the major categories of human resources

20.2. Characteristics of the different categories of human resources

Content:
• Definition of human resources management;
• Characteristics of the different categories of human resources

Learning Outcomes:
Students should be able to:
20.2.1. Define human resources management;
20.2.2. Understand the characteristics of the different categories of human resources

20.3. Principles of basic labour relations prescripts

Content:
• The actors in the labour relations system;
• Trade unions;
• Principles of freedom of association

Learning Outcomes:
Students should be able to:
20.3.1. Outline the major actors in the labour relations system;
20.3.2. Understand the role of trade unions

Section 21. Understand principles of freedom of association
Suggested Study Hours

Applied Agriculture and Agricultural Science is a 30-credit course, which relates to 300 notional study hours. It is envisaged that a typical one-year offering of the course will cover 30 weeks, excluding revision and examination time. Learners should therefore spend 10 hours per week on the course. This should consist of 6 hours of face-to-face instruction and 4 hours of self-study.

It is recommend that the subject content be studied in the order presented, starting with “Agriculture as an applied science” and ending with “Agricultural production management practices in relation to socio-economic environment” to ensure progressive development within each of the sections.

A suggested time allocation for the course is shown in the table below:

<table>
<thead>
<tr>
<th>Component</th>
<th>Face-to-face Teaching Time</th>
<th>Self-study Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture as an applied science</td>
<td>6 hours per week × 1 week</td>
<td>4 hours per week × 1 week</td>
</tr>
<tr>
<td>Sustainable crop production</td>
<td>2 hours per week × 29 weeks</td>
<td></td>
</tr>
<tr>
<td>Sustainable livestock production</td>
<td>2 hours per week × 29 weeks</td>
<td></td>
</tr>
<tr>
<td>Agricultural production management practices in relation to socio-economic environment</td>
<td>2 hours per week × 29 weeks</td>
<td></td>
</tr>
<tr>
<td><strong>Total Course Hours</strong></td>
<td><strong>300 hours</strong></td>
<td></td>
</tr>
</tbody>
</table>