UNIT: 1 Principles of Botany

For use with the Higher National Certificate and Higher National Diploma in Horticulture
First teaching from September 2018

Issue 1
Edexcel, BTEC and LCCI qualifications

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### Higher National Certificate/Diploma in Horticulture

**SCHEME OF WORK**

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<tr>
<td>Unit Title:</td>
<td>Principles of Botany</td>
<td>Tutor:</td>
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<tr>
<th>Learning Outcomes (LO)</th>
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<tr>
<td><strong>LO1 Assess the role of plants as energy sources for all living organisms</strong></td>
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<tr>
<td><strong>LO2 Demonstrate the fundamentals of plant anatomy, physiology and morphology</strong></td>
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<tr>
<td><strong>LO3 Analyse the evolutionary and ecological relationships between plants</strong></td>
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<tr>
<td><strong>LO4 Describe the relationships between plants and humans</strong></td>
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<th>Sessions</th>
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| Session 1 | LO1 | **Topic(s):**  
• Introduction to Botany, Principles of Botany, and a review of the role of plants as energy sources for all living organisms  
**Sample activities:**  
• Tutor activity: Introduction to unit and assessment expectations  
• Group activity: Class discussion on the significance of plants as energy resources using examples |
| Session 2 | LO1 | **Topic(s):**  
• Photosynthesis  
**Sample activities:**  
• Tutor activity: Presentation or video demonstration and explanation of photosynthesis  
• Individual or group activity: Lab-based activities on the manipulation of light levels and sugar production in leaves. |
| Session 3 | LO1 | **Topic(s):**  
• Respiration  
**Sample activities:**  
• Tutor activity: Introduction on respiration equation, differences between animal and plant respiration,  
• Group or pair activity: Illustration of lab-based practicals and interpretation of results. |
| Session 4 | LO1 | **Topic(s):**  
• Transportation in plants: Transpiration and osmosis  
**Sample activities:**  
• Individual or group activity: Lab-based practicals.  
• Tutor activity: Discussion on the topic. |
| Session 5 | LO1 | **Topic(s):**  
• Nutrient uptake in plants  
**Sample activities:**  
• Tutor activity: Role of plant cell walls, nutrient uptake and cation exchange.  
• Pair activity: Students to produce posters illustrating nutrient uptake. |
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| Session 6 | LO2                | **Topic(s):**  
• Plant structure and function: Anatomy and morphology  
**Sample activities:**  
• Tutor activity: Presentation on the growth and function of plant cells, primary and secondary growth  
• Individual activity: Students to undertake research collecting examples of plant structure and function. |
| Session 7 | LO2                | **Topic(s):**  
• Cell differentiation: Roots and shoots  
**Sample activities:**  
• Tutor activity: Structure and function of root and shoot tissue, cell differentiation.  
• Pair activity: students to compare and contrast cell differentiation in roots and shoots |
| Session 8 | LO2                | **Topic(s):**  
• Cell differentiation: Stems and leaves  
**Sample activities:**  
• Tutor activity: Presentation introducing students on cell differentiation on stem and leaves  
• Individual or group activity: Lab-based practical on the dissection of principle components of stems and leaves, their structure and function, and the use of light microscopes. |
| Session 9 | LO2                | **Topic(s):**  
• Cell differentiation: Flowers and fruits  
**Sample activities:**  
• Tutor activity: Tutor activity: Presentation introducing students on cell differentiation in flowers and fruits  
• Pair activity: Lab-based practicals on the dissection of flowers and fruits, the structure and function of principle structures, and differences in plant tissue. |
| Session 10 | LO2            | **Topic(s):**  
• Plant growth and development: Germination and seedling growth  
**Sample activities:**  
• Tutor activity: Development of germinating seedling in mono- and dicotyledonous plants, factors triggering germination. |
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| Session 11 | LO3 | **Topic(s):**  
- Evolutionary and ecological relationships between plants  
**Sample activities:**  
- Tutor activity: Prokaryotic and eukaryotic cells, structure and differences in organelles.  
- Group activity: Discussion of the evolutionary theory relating to plant development. |
| Session 12 | LO3 | **Topic(s):**  
- Plant classification: Bryophytes and ferns  
**Sample activities:**  
- Tutor activity: Presentation introducing students to the topic  
- Individual or group activity: Lab-based practical on the identification of principle structures of mosses and common ferns, and the life cycles of bryophytes and ferns. |
| Session 13 | LO3 | **Topic(s):**  
- Plant classification: Conifers and flowering plants  
**Sample activities:**  
- Tutor activity: Presentation introducing students to the topic  
- Individual or group activity: Lab-based practical on the identification of principle structures of conifers and flowering plants, and their life cycles. |
| Session 14 | LO3 | **Topic(s):**  
- Ecological relationships between plants  
**Sample activities:**  
- Tutor activity: Class presentation on Mutualism, parasitism, pollination  
- Pair work: Students to work in pairs to create posters illustrating the ecological relationship between plants. |
| Session 15 | LO3 | **Topic(s):**  
- Global distribution of plants  
**Sample activities:**  
- Tutor activity: Introduction to the concept of biomes, distribution of global biomes, plant adaptations to biome environments. |
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| Session 16 | LO4 | **Topic(s):**  
- Uses of plants and human/plant relationships  
**Sample activities:**  
- Tutor activity: Tutor to deliver presentation on topic  
- Individual or group activity: Supermarket shop and identification of all plant-based products. |
| Session 17 | LO4 | **Topic(s):**  
- Plants as food  
**Sample activities:**  
- Tutor activity: Global food markets, value and worth of global markets, principle products and  
- Group activity: Tutor-led whole group discussion around genetic variation. |
| Session 18 | LO4 | **Topic(s):**  
- Plants in medicine and construction  
**Sample activities:**  
- Tutor activity: Economic value of plants, contribution to global markets development of new plant products. |
| Session 19 | LO4 | **Topic(s):**  
- Role of plants in ecosystem services  
**Sample activities:**  
- Tutor activity: Tutor presentations on regulation of water cycles, water purification and sustainable flood control in urban and agricultural landscapes. |
| Session 20 | LO4 | **Topic(s):**  
- Role of plants in ecosystem services  
**Sample activities:**  
- Tutor activity: Tutor presentations on gaseous exchange and regulation of oxygen and carbon dioxide, plants as carbon stores, aesthetic and cultural uses of plants. |
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Higher Nationals in
Horticulture

SCHEME OF WORK

UNIT: 2 Business and the Business Environment

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<td>Unit Number:</td>
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<tr>
<td><strong>LO1</strong> Explain the different types, size and scope of Land-based organisations</td>
<td>✗</td>
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<tr>
<td><strong>LO2</strong> Demonstrate the interrelationship of the various functions within a Land-based organisation and how they link to organisational structure</td>
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<tr>
<td><strong>LO3</strong> Use contemporary examples to demonstrate both the positive and negative influence/impact the macro environment has on Land-based business operations</td>
<td>☐</td>
<td>✗</td>
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<tr>
<td><strong>LO4</strong> Determine the internal strengths and weaknesses of specific Land-based businesses and explain their interrelationship with external macro factors</td>
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| Session 1 | LO1 | **Topic(s): Different types of business organisations**  
- Introduction to the unit's content and two unit assignments  
- What is a business?  
- Types of organisation, profit and non-profit entities  
- Formal and informal businesses  
- Legal structures – sole trader, partnerships, limited companies  
- Other forms of business entity  
**Sample activities:**  
- Group activity: Question and answer activity on general/prior knowledge of different business types.  
- Group activity: Discuss and differentiate legal entities e.g. sole trader, partnership etc.  
- Pair activity: Activity in pairs to establish advantages and disadvantages of each business type. |
| Session 2 | LO1 | **Topic(s): Size, scale and scope of different organisations**  
- Issue and introduce Assignment 1  
- Explore differences in businesses on the basis of their main function, scope and the size of operations.  
- National, international and global business development and growth.  
**Sample activities:**  
- Individual activity: Measure business size. Large and small organisations – business scale.  
- Individual activity: Use of case studies to highlight differences in large, small and micro businesses.  
- Group activity: Group discussion – organic growth of a business through different structures e.g. sole trader, partnership, limited company. |
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| Session 3 | LO1 | **Topic(s): Stakeholders, roles and responsibilities**  
- Investigate different roles within typical businesses and the responsibilities associated with different levels and authorities.  
- Stakeholder analysis and meeting stakeholder needs.  
- Business obligations to stakeholders in the context of corporate social responsibility (CSR).  
**Sample activities:**  
- Group activity: Work in a small group to research and identify different roles within different businesses.  
- Group activity: Each group create a quiz activity on responsibilities attached to different roles in a business and test one another.  
- Group activity: Discuss levels of authority and associated responsibilities. |
| Session 4 | LO1 | **Topic(s): Business environment**  
- The purpose of economic activity and the production of goods and services to satisfy changing needs and wants.  
- Introduction to economic concepts e.g. scarcity and choice, supply and demand  
- Industrial structures definition and introduction to Porter's Five forces to analyse industry structure.  
**Sample activities:**  
- Brainstorm activity: Discuss different economic concepts and different examples.  
- Group activity: Research how businesses respond to variations in supply and demand.  
- Group activity: Case study discussion – the application of Porter’s Five Forces to identify and understand industry competition. |
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|          | LO2                 | **Topic(s): Functional areas in business (part 1)**  
  - Explore different main functions or departments such as marketing, finance, human resources.  
  **Sample activities:**  
  - Group activity: Identify different departments/functions in a given business. Tutor to provide different contexts to explore differences.  
  - Group activity: Different groups present back the main generic functions such as marketing, finance and human resources, including their roles and responsibilities.  
  - Group activity: Review different organisational charts. Small group feedback on how a particular chart illustrates functional interrelationships. |
| Session 5| LO2                 | **Topic(s): Functional areas in businesses (part 2)**  
  - Explore secondary/additional functions or departments found in some businesses such as procurement, maintenance, operations and manufacturing.  
  **Sample activities:**  
  - Group activity: Identify and list additional support departments/functions in different types of businesses from different sectors. Tutor to provide different contexts to explore differences.  
  - Group activity: Different groups present back on each of the additional functions such as procurement, maintenance, operations and manufacturing, including their roles and responsibilities. |
| Session 6| LO2                 | **Topic(s): Functional interrelationships**  
  - Explore interrelationships between various functions and the impact on operational effectiveness.  
  - Explore the role of different functions in achieving organisational goals and objectives.  
  **Sample activities:**  
  - Group activity: Establish the links and dependencies between different departments/functions in a given business. Tutor to provide different contexts to explore differences.  
  - Group activity: Discussion and student input into the relation between various functions previously identified.  
  - Pair activity: Work in pairs to explore the role of different functions in achieving organisational objectives. |
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| Session 8 | LO2 | **Topic(s): Functions and structures (part 1)**  
  - Define organisational charts and their use.  
  - Different structures e.g. flat or tall hierarchical, matrix etc.  
  - Investigate how different functions impact on organisational structures.  
  - The impact of size and scope on organisational structures  
  **Sample activities:**  
  - Group activity: Question and answer activity – what are organisational charts and what is their purpose? Identify the different types e.g. tall or flat.  
  - Group activity: Discussion and student input on how different functions report into each other.  
  - Group activity: Create an organisational chart for a given business.  
  - Individual or group activity: Reflect on how size and scope of previous activity affected the structure created by students. |
| Session 9 | LO2 | **Topic(s): Functions and structures (part 2)**  
  - Explore differences between structures on the basis of size (national, global etc.) and location.  
  - Complexities of local, transnational, international and global organisations  
  - Virtual structures  
  **Sample activities:**  
  - Group activity: Discuss varied structures such as chain, franchise, head office operated and others.  
  - Individual activity: Student research into centralised and de-centralised structures and management.  
  - Group activity: Student debate on the use of virtual structures, appropriateness and future practices. |
| Session 10 | LO1 & LO2 | **Topic(s): Assignment draft review workshop**  
  - Review of student progress on the first assignment.  
  - Review of academic requirements and submission format.  
  **Sample activities:**  
  - Tutor activity: Brief tutor-led overview of assignment requirements.  
  - Group activity: Open question and answer activity to address general questions and concerns. |
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| Session 11 | LO3 | **Topic(s): Environmental analysis**  
  - Issue Assignment 2/Introduction to the second assessment  
  - Define the concept of environmental analysis in a business context.  
  - Macro and micro environmental analysis  
  - Introduction to PESTLE and SWOT/TOWS analytical tools  
  **Sample activities:**  
  - Pair activity: Investigate and define business environmental analysis.  
  - Group activity: Differentiate between a macro and micro environmental analysis.  
  - Tutor activity: Tutor-led definition and explanation of a PESTLE and a SWOT/TOWS analysis. |
| Session 12 | LO3 | **Topic(s): Macro environmental analysis – PESTLE (part 1)**  
  - In-depth delivery of a PESTLE analytical tool  
  - Investigation of current case studies with which to apply the model  
  **Sample activities:**  
  - Tutor activity: Tutor-led explanations and questioning – political, economic and social factors  
  - Group activity: Research activity to investigate current political, economic and social factors influencing and impacting the business environment. Students present feedback and discuss.  
  - Group activity: Apply the researched factors to a given organisation.  
  - Pair activity: Find a business to apply PESTLE and SWOT/TOWS analysis. |
| Session 13 | LO3 | **Topic(s): Macro environmental analysis – PESTLE (part 2)**  
  - In-depth delivery of a PESTLE analytical tool  
  - Investigation of current case studies with which to apply the model  
  **Sample activities:**  
  - Group activity: Tutor-led explanations and questioning – technological, legal and environmental factors.  
  - Group activity: Research activity to investigate current technological, legal and environmental factors influencing and impacting the business environment. Students present feedback and discuss.  
  - Group activity: Apply a PESTLE analysis to a given organisation.  
  - Pair activity: Create a PESTLE analysis for presentation in the next session. |
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| Session 14 | LO3 | **Topic(s): Macro environmental analysis applied – PESTLE**  
- Investigation of PESTLE analysis applied in and presented by students for their selected contexts.  
**Sample activities:**  
- Individual or group activity: Student presentations of a PESTLE analysis for a chosen business.  
- Individual or group activity: Peer review and feedback on presentations.  
- Tutor activity: Tutor to summarise findings and link to Assignment 2. |
| Session 15 | LO3 | **Topic(s): Macro environmental impact and response**  
- Investigation of how the macro environment affects business operations.  
- Transformation processes that organisations go through in response to change.  
**Sample activities:**  
- Group activity: Brainstorming session on ways a business could respond to change.  
- Tutor activity: Tutor-led critical reflection of practicalities of discussed changes. |
| Session 16 | LO4 | **Topic(s): Micro environmental analysis – SWOT/TOWS**  
- In-depth delivery of a SWOT/TOWS analytical tool as an analysis framework  
- The link between external factors and internal SWOT  
- Investigation of current case studies with which to apply the model  
**Sample activities:**  
- Tutor activity: Tutor-led explanations and questioning – SWOT factors. The value of SWOT analysis and implementation.  
- Group activity: Question and answer activity – S&W influenced by PESTLE, which Q&Ts arises from PESTLE.  
- Group activity: Apply a SWOT/TOWS analysis to a given organisation.  
- Group activity: Group presentation of SWOT analysis with Q&A. |
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| Session 17 | LO4 | **Topic(s): Micro environmental analysis applied – SWOT/TOWS**  
• Investigation of a SWOT/TOWS analysis applied and presented by student for their selected contexts  
**Sample activities:**  
• Individual or group activity: Student presentations of a SWOT analysis for a chosen business.  
• Individual or group activity: Peer review and feedback on presentations.  
• Tutor activity: Tutor to summarise findings and link to Assignment 2. |
| Session 18 | LO4 | **Topic(s): Internal factors and responses affecting operations**  
• Investigate how internal factors should be analysed and how strengths and weaknesses that affect business operations form the basis for strategic management.  
• Decision-making and action-planning based on SWOT analysis findings  
**Sample activities:**  
• Group activity: Investigate how information from a SWOT analysis should be viewed and used.  
• Pair activity: Explore and list possible business strategies that could respond to SWOT and PESTLE factors.  
• Tutor activity: Tutor-led critical reflection of practicalities of discussed strategies. |
| Session 19 | LO3 & LO4 | **Topic(s): Assignment workshop**  
• Review of student progress on the second assignment.  
**Sample activities:**  
• Tutor activity: Brief tutor-led overview of assessment requirements.  
• Group activity: Open question and answer activity to address general questions and concerns.  
• Group activity: Review of academic requirements and submission format.  
• Individual activity: Individual student queries and questions. |
| Session 20 | LO3 & LO4 | **Topic(s): Assignment draft review workshop**  
• Review of individual student drafts for second assignment  
**Sample activities:**  
• Individual activity: Individual appointments to address individual student queries and questions. |